

# **Social Science Abstracts**

**Volume XLIII, 2020**



**FOCAL THEME**

**CURRENT SCIENCE OF NATURE-HUMAN-  
SOCIETY IN INDIA**



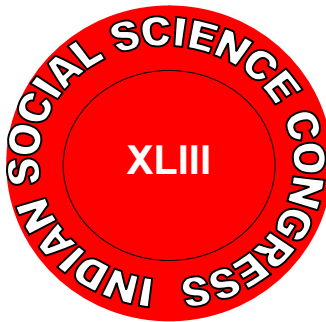
**भारतीय समाज विज्ञान अकादमी**

**INDIAN SOCIAL SCIENCE ACADEMY  
INDIA**

# **Social Science Abstracts**

## **Volume XLIII, 2020**

**PAPERS AND ABSTRACTS OF PAPERS**



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**January 17-21, 2020**

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# BHARATIYA SAMAJIK CHINTAN

(A Multidisciplinary Theoretical Science Journal)

*Bharatiya Samajik Chintan* is a multidisciplinary theoretical and philosophical journal of science of Nature-Humans-Society. It strives to discover, develop and disseminate Science of Nature-Humans-Society in Indian conditions in particular, and world conditions in general. It is a refereed Journal. Research scientists from any branch of science including engineering, and technology, social activists, philosophers and educationists are welcome to join Bharatiya Samajik Chintan through their research or review papers, critical essays and comments.

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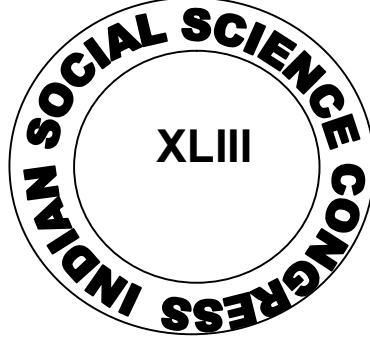
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**Volume XLIII, 2020**



**CURRENT SCIENCE OF NATURE-HUMAN-  
SOCIETY IN INDIA**

Edited

BY

N. P. CHAUBEY  
&  
D. M. DIWAKAR



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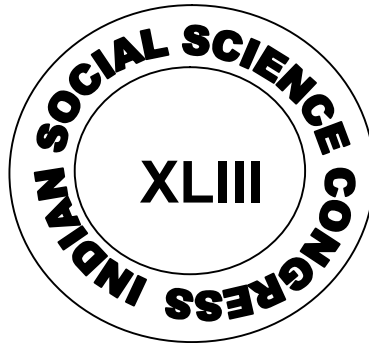


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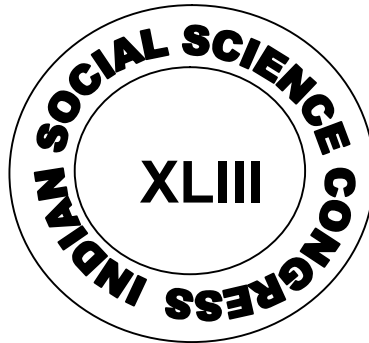
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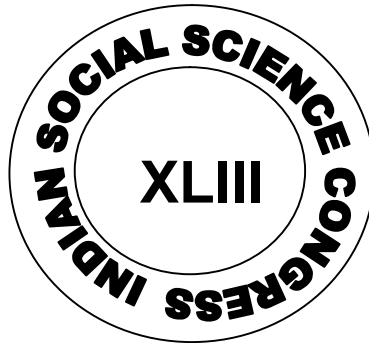


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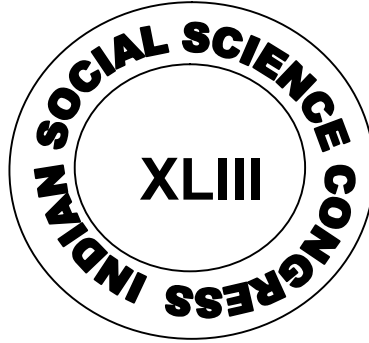


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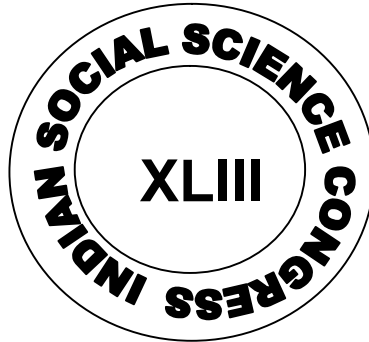


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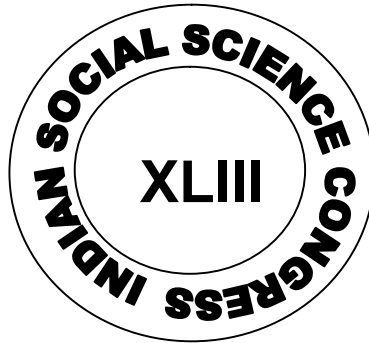


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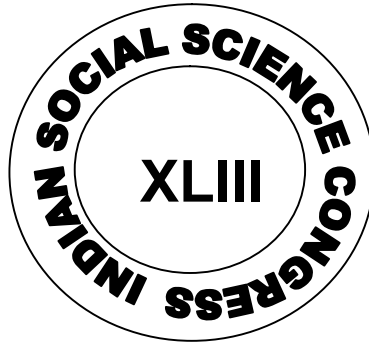


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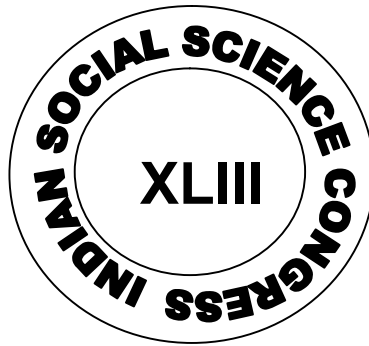
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LECTURE**

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Almost all the Chairpersons of 28 Subjects Research Committees, 21 Thematic Panels and Seminars/Symposia/Workshops made vigorous efforts to mobilize good research papers. This volume reflects their contribution very well. However, they are in no way responsible for any omission/commission We wish to thank all of them for their support. We also wish to thank Prof. H. N. Misra, the Treasurer of the Indian Social Science Academy for his unconditional support.

We received great support from the staff of the Indian Social Science Academy. Sri Abhishek Kumar, Sri Vinod Chandra Pandey, Sri Nitin Kumar Pandey, Sri R. M. Tripathi and Sri Santosh Kumar worked very hard. They worked even on Sundays and holidays cheerfully. What is being presented here is, indeed, the result of their collective hard works and devotion to the Indian Social Science Academy. They are the true torch bearers of science in modern Democratic Republic of India .We express our gratitude to all of them and thank each one of them sincerely and profusely.

Researchers and contributors are welcome to point out errors and put their critical comments freely. We are responsible for all omissions and commissions.

It may be noted that the views expressed and facts presented in the volume are those of the respective authors and in no way reflect the views of the Indian Social Science Academy and Bengaluru Central University or any other committee of the XLIII Indian Social Science Congress.

In case of some of the papers either only title has been printed or the text of abstracts have been revised. Late receipt of papers made the task of editing quite difficult. Several papers have been printed without proper editing. One Chairpersons of one of the Research Committees withdrew because of editorial comments.

Date: January 02, 2020  
Place: Allahabad

Editors: Prof. D. M. Diwakar  
Prof. V. Sivaram  
Prof. M. Muniraju  
Prof. V. Jagannatha  
Dr. N. P. Chaubey



## PREFACE

Indian Social Science Academy and Bengaluru Central University resolved to initiate a new process by focusing deliberations of the XLIII Indian Social Science Congress on ‘**Current Science of Nature –Human-Society in India**’. The process involved (a) critical appraisal of subject-wise current research and theory and (b) publication of subject-wise volumes on **Current Research and Theory in all Indian languages**. The purpose behind it is to create scientific literature in all Indian languages for enabling Indian people speaking different languages to learn science and become creative. Thinking behind it is that pursuit of science in English since the British rule has made Indian languages poor in modern science because of which Indian people today are ignorant of modern science and least creative, more superstitious and blind. Quality of science education and research in English is inferior, more imitative and least creative. It needs to be well understood that all Indian languages are well developed and are victims of colonial malicious design of making India poor in S&T.

Need of the hour is to revert to science education and research in all Indian languages. Indian Social Science Academy seeks to make its humble contribution through publications in Indian languages, State Social Science Academies, State Social Science Congress in state language and National Science Translation Centre.

The National Academic Advisory Committee worked out an approach paper detailing the objectives, issues and approach which is printed in this volume. Local and outstation chairpersons of 28 Subject Research Committees and 21 Interdisciplinary Thematic Panels and their members were nominated. All the Chairpersons and members of respective Committees/Thematic Panels were requested to identify and invite good researchers in all possible areas and request them to contribute substantive papers reviewing researches in India in the past 20-30 years. Besides, following themes were chosen for special Seminars/Symposia, Workshops during the XLIII Indian Social Science Congress:

1. Frontiers of Science and Future of Societies
2. Social Imperatives of Science in India
3. Current Social Science Research and Theory in India
4. New Education Policy 2019
5. Current Space Science, Technology and Society
6. Small and Medium Industries in India Today

All universities, colleges, Research Institutes, Engineering Colleges, IITs, IIITs, Medical Science Universities, AIIMS and Regional/National Laboratories, NISERS, ISERS were requested to extend their support by encouraging their good researchers to contribute papers and participate in the XLIII Indian Social Science Congress. Over 1000 scientists of diverse subjects were approached through letters and telephones.

Several Pre-XLIII Indian Social Science Congress local level Symposia were held at New Delhi, Vidisha , Bengaluru and other places.

Results of massive collective efforts by Indian Social Science Academy and Bengaluru Central University are printed in this volume. All full papers or abstracts of papers received till December 31, 2019 have been printed. Careful examination of this volume will show (a) that the result is not as expected and (b) quality of all papers is not as it should be as the English medium of science education and research is a big barrier to quality and originality.

It is now clear that the task is gigantic. It may take at least 5-7 years to produce visible results. This, of course, shall depend upon willingness of all research scientists to do hard work and that support of all the Universities, colleges, Research Institutes/Laboratories, etc, is readily available to ISSA. Government’s willingness to provide necessary financial support will facilitate faster realization of the goal. Success in this mission will bring massive qualitative as well as quantitative change in Science Education, Research and creativity. It ought to be kept in view that Indians are no less intelligent and creative than Europeans, Americans, Chinese or others.

**Editors:** Prof. D. M. Diwakar  
Prof. V. Sivaram  
Prof. M. Muniraju  
Prof. V. Jagannatha  
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# भारतीय समाज विज्ञान अकादमी

## INDIAN SOCIAL SCIENCE ACADEMY

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Indian Social Science Academy (ISSA, formerly Indian Academy of Social Sciences) is a National Science Academy with a difference. It is first National Science Academy in today's world (a) to conceive science as **Social**, (b) to bring all subjects of Science under one umbrella of Science of Nature-Human-Society by advocating **indivisibility of Science**, (c) to draw attention of all towards the need for **freeing science from politics and market forces** for preserving and promoting **the liberating potentially of it**, (d) to emphasize on need for development of indigenous science and Technology for **self-reliant national development**, resulting in solution of centuries old perennial problems of poverty, hunger, disease, illiteracy, violence, oppression, discrimination, etc and effecting qualitative and quantitative change in material, social and cultural life of peoples of India in particular, and world in general and (e) to emphasize the need for **pursuing science in all Indian Languages** in order to be creative and enabling the people of India to learn Science in order to live as a better human being. Full freedom, congenial environment and bonds of friendship between Science, Society and people are necessary conditions for development of indigenous science of Nature-Human-Society. **Brain-drain is a killer of indigenous S&T.**

The Indian Social Science Academy was established on August 15, 1974 and registered on December 26, 1974 with its headquarters at Allahabad by then unknown young patriotic scientists of India. Since then it has created following instruments for achieving its objectives:

- I. Indian Social Science Congress
- II. Research and Training Centres
  - (a) Rural Development Study Centre
  - (b) Survey Research Centre
  - (c) Silver Jubilee Peoples Centre for Theoretical and Policy Research for Sustainable Development
- III. Publication of Research Journals and Books/ Monographs
  - (a) Bhartiya Samajik Chintan
  - (b) Samayak Samajik Chintan
  - (c) Social Science Abstract
  - (d) Monographs and Books (over 60 books have been published)
- IV. State Science Academies (e.g, Bihar Social Science Academy, U.P. Social Science Academy, A.P. Social Science Academy, Karnataka Social Science Academy, etc.)
- V. State Social Science Congress in state Language ( Bihar Social Science Congress, U.P Social Science Congress , Kannada Social Science Congress, etc.)
- VI. Young Scientists Division
- VII. All India Young Scientists Convention
- VIII. National Science Translation Centre

Membership of the Indian Social Science Academy is wide open. All those who are pursuing science in any subject and those who wish to pursue science are welcome to it.

Visit Website: [www.issaindia.org](http://www.issaindia.org) for details and write to the following:

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## WHY SCIENCE IS SOCIAL?

What is science? Science is knowledge, objective knowledge of an object(s)/ a thing(s). Objective means relating to an object or a thing? What is an object or a thing? That which exists independent of human's will is an object or a thing. An object/or a thing can be solid, liquid or gaseous. It can be inanimate/non-living or animate/living. A term matter is used to describe all forms of objects/things. So science is objective knowledge of matter, both, living and non-living.

What is knowledge? Knowledge is answer (s) to questions what? How? And why? of/about a thing/object /matter. All humans ask following questions whenever they come across an object/or a thing:

1. What is it?
2. How is it?
3. Why is it?

Their answers to the three questions constitutes knowledge. Their answers can be correct or incorrect. Correct answers constitute objective knowledge and/incorrect answers define lack of knowledge or ignorance.

Here it is necessary to remember that *knowledge-in-itself*, be it objective or subjective is not the object or *thing-in itself*. That is to say, knowledge is not synonymous to object/thing/or matter. So knowledge is colourless, odourless, weightless, sizeless and shapeless whereas a thing/an object does have colour, weight, size, shape, odour etc. Nevertheless connection between knowledge and object/thing/matter is vital for without it humans cannot build their appropriate relations with it and in the absence of it their survival and growth will become impossible. To be precise science is a mirror of the object/thing to which it is related. Science is concrete as well as abstract.

Science as objective knowledge enables humans to establish their connections with the world in which they live.

Question arises: How do humans acquire objective knowledge of the world in which they live? Answer to it, though looks simple, is actually complex. All humans including non-humans are equipped with sensory-motor mechanism in their bodies (eyes, ears, nose, tongue, skin). Sensory-motor-based knowledge about or of a thing/an object is called 'perception' or 'perceptual knowledge'. Now there is a vast literature on 'perception' or 'perceptual knowledge' in modern psychology. A new branch of science termed 'Cognitive science' is being pursued and propagated in modern science. What the vast literature on 'perception' or 'cognition' shows is that it is less than objective or accurate perhaps because of limited capacity of sensory-motor mechanism. Also, it is susceptible to social influence. This is clear from the literature on 'social perception'. So the humans had to find ways and means to correct the errors and limitations of perception-based knowledge of objects/things. Initially each perception led them to act and in turn each act enabled them to correct their perception. Thus *Perception-Action-Perception-Action* formed the chain for correction in perceptual knowledge. In history of science knowledge is often described as ethno-science. With passage of time humans and their societies grew and in the process ethno-science grew into science. Humans learnt to act in cooperation with each other and share the fruits of their labour together. The collective mental and physical labour led them to discover methods capable of improving their perceptual knowledge. The collective mental and physical labour for understanding the object(s)/thing(s)/matter/produced what is known as science. This can be well understood or well appreciated only through the study of history and philosophy of science since the days of primitive man. But it can also be understood by looking at the modern science which is highly socially organized. Like factory workers thousands of scientists work together in laboratories/research institutes all over the world today.

What is social? An act or result of an act involving two or more than two individuals is called social. Since science is produced by two or more than two individuals, it is social. In other words basic character of science is *social*. What does it mean?

It means that very notion of *science is social*. It means the notions of verifiability, repeatability, reliability, validity, precision, exactness, isomorphism, measurement, methods, hypothesis, inference and theory are social notions. It means there is close connection between society and science and between social conditions and science. As humans and their societies develop so does science. It also means that proclivity of all humans to social influence and their inability to free themselves wholly from the social and personal prejudices tend to influence objectivity of science. It means science is 'primitive' to some extent and 'precious' to large extent. It is 'primitive' to some extent because it is never cent percent objective. It is, 'precious' to a large extent because there is no other system of better objective knowledge.

What is its implication? It implies that the division of science between science and social science is no longer correct. Today there is no dichotomy between Nature, humans and society or between living matter and non-living matter. Through long and arduous pursuits humans discovered their origin and connections with Nature. Today the term Nature conotes all non-living and living objects including humans and their societies. The 18<sup>th</sup> century notion of Nature and science or basic science is no longer a valid notion. It might be convenient to fragment science into various subcategories for the sake of study, but it will not serve its social purpose if it is not put together. Science of Nature, therefore, is necessary for modern humans and their societies. Science of Humans and their societies is integral to the science of Nature.

It also means that science is never eternal or static. All objects/things are in constant motion. Since all objects/things keep on changing so does their science. Also, each object is divisible into two because of mutually opposite attributes inherent in it. That is to say, nature of nature, be it non-living or living is dialectical. There is nothing like linearity in Nature. Science, therefore, is dialectical and not linear.

The need for verification and repetition makes science authority free. There is no place for authority in science. Any one and every one enjoys the right to challenge science. Democracy, therefore, is necessary for science. Science grows in democratic conditions and dies in undemocratic or authoritarian conditions.

***[Critical comments on this note are most welcome. Those who think science is not social are invited to put their thoughts in writing and send to the General Secretary, Indian Social Science Academy (E-mail- issaald@gmail.com)]***

# XLIII INDIAN SOCIAL SCIENCE CONGRESS

## FOCAL THEME

### CURRENT SCIENCE OF NATURE-HUMAN-SOCIETY IN INDIA

#### 0100 PREAMBLE

**Indian Social Science Academy and Bengaluru Central University have resolved to focus deliberations of the 43<sup>rd</sup> Indian Social Science Congress on ‘Current Science of Nature-Human-Society in India’ with a view to determining nature and extent of connection/correlation between the national goals of self-reliant growth, removal of poverty, hunger, disease, ignorance, illiteracy, discrimination, oppression, rapes, murders, violence, inequality and making India a truly secular Democratic Republic having strong pillars of equality, freedom, fraternity and social justice, where all Indians irrespective of their class, caste, creed, gender and region are seen enjoying equally high order of material, social and cultural life.**

#### 0200 CONTEXT

Indian Parliament passed a **Scientific Policy Resolution (SPR)** in 1958 with a sole object of making India self-reliant on its own Science and Technology. Realizing the connection between Science, Technology and problems of poverty, hunger, disease, etc and the liberating power of science, the Parliament assigned primary role to science and scientists for making Democratic Republic of India a truly democratic, prosperous, modern nation having no trace of colonial poverty, hunger, ignorance, disease, discrimination, exploitation, rich and poor divide, etc. New Universities, Institutes and Laboratories were established. Managers of Science and Technology declared India having third largest manpower in Science and Technology in the world in 1970s. It was, then, said that India was far ahead of China in Science and Technology. How is science and Technology today? Managers of Science and Technology no longer speak about it.

In 1983, the Government of India instead of Parliament issued Technology Policy Statement in lieu of Technology policy. In early 2000 the Government of India started creating new science education institutes naming Indian Institute of Science Education and Research, National Institute of Science Education and Research in different parts of India. Department of Science and Technology launched new programmes of incentivisation of science education and research between 2006-10. These were designed to attract young scientists. DST also offered fellowships to those who had migrated to USA and had done well in science there.

Democratic Republic of India converted Imperial Council of Industrial Research into Council of Scientific and Industrial Research (CSIR) and Imperial Council of Agricultural Research into Indian Council of Agricultural Research (ICAR). It also setup Indian Council of Medical Research and several research institutes within it. Later in late 1960s and early 1970s Indian Council of Social Science Research, Indian Council of Philosophical Research and Indian Council of Historical Research were established.

All India Institute of Medical Sciences (AIIMS) was established as the premier referral and research institute. Later on Post Graduate Medical Institutes (PGI) were established in Chandigarh, Pondicherry and Lucknow. Since then several AIIMS and PGI's have been established all over India.

Indian Institute of Technology was setup at Kharagpur, Kanpur, Madras (now Chennai) and Bombay (now Mumbai) and later on several IITs have been set up all over India.

Three Science Academies, namely, Indian National Science Academy (INSA), National Academy of Science India (NASI) and Indian Science Academy (ISA) were established during British rule, Fourth Science Academy, Indian Academy of Social Sciences (now Indian Social Science Academy, (ISSA) was established on August 15, 1974 in order to bring all subjects of Nature-Human-Society under one umbrella and give a new direction to Science and Technology in consonance with the democratic needs, aspirations and creative urges of people of India. Also, Agricultural Science Academy, Engineering Science Academy and Medical Science Academy were established in 1980's.

Democratic Republic of India setup several educational commissions (Mudaliar Commission, Kothari Commission, etc.) with a view to replacing British colonial education system by a new democratic education system in tune with new democratic aspirations of peoples of India. "Education for all", "Free Universal Education" and "Health for All" became the new slogans.

Indian Science Congress Association was established in 1914 by the Indian scientists in British India who also established Association for Cultivation of Science. Indian Academy of Social Sciences, (now Indian Social Science Academy) began organizing Indian Social Science Congress in 1976. It was a new milestone in the realm of science as it brought all subjects of science of Nature-Human society together and termed science as **social** and **indivisible**. It was a unique endeavour to break the current divisions in science and promote the true social nature of scientific knowledge called science of Nature-Human society. Also, there are national, regional and local subject associations of all subjects including languages. Hindi Sahitya Akademi and Lalit Kala Academy too were established.

Jamshedji Tata setup Indian Institute of Science at Bangalore (now Bengaluru). Later on he also setup Tata Institute of Fundamental Research and Tata Institute of Social Science at Bombay (now Mumbai). Government of India established Atomic Research Centre (now Bhabha Atomic Research Centre) after independence. Indian Space Research Organization (ISRO) too was established.

NCERT was established for improving education in Schools. Later each state established State Council of Education, Research and Training (SCERT).

A new Commission called University Grants Commission (UGC) was established by the Parliament. UGC was set up to coordinate and maintain standards in higher education. Later on the government of India also set up All India Council of Technical Education, National Council of Teachers Education, Council of Architecture, Pharmacy Council, Bar Council and so on. These attempted to coordinate, promote and regulate education in their respective areas.

Government of India established Indian Institute of Advanced Study at Shimla. UGC started establishing Advanced or special Study Centers in good University departments in late 1970s. It also established special institutes for interdisciplinary research in selected universities and inter-university centers in Astrophysics and Astronomy, Nuclear Science Centre, Consortium of education Communication, Information and library network, and National Assessment and Accreditation Council. All these attempted to promote research in their respective areas.

A process of creating elite science education and Research Institutes began in late 1980's under the overall leadership of Prof. C.N.R.Rao, who has been later on conferred 'Bharat Ratna' award for it. The new institutes were named 'National Institute of Science Education and Research (NISER) or Institute of Science Education Research (ISER). Science Olympiad was added to it. Homi Bhabha Centre for Science Education emerged under TFIR in 1980's.

Later teacherless education, namely, **Open education, Distance Education, Open University, Adult Education, Sarva Shiksha Abhiyan**, etc., were added. A programme called "**Operation Black Board**" was launched on war footing. Parliament made education the fundamental rights through an Act, though till date it has not been implemented. The World Bank entered Indian Education in early 1980s, although secretly.

With the launching of Structural Adjustment Programmes (SAP) called **Liberalisation, Privatisation, Globalisation** (LPG) in 1991, scene in education changed. Birla-Ambani (the top Indian Industrialists) Report appeared as the new guideline to education in India. Doors of education were wide opened for private players and the corporate world. "Policy of Contract Teaching" on the pattern of "Policy of Contract Labour" in industries and government and Contract Farming in Agriculture was introduced. Thus, began the process of teacherless education and research in Indian Universities, schools, Colleges and Institutions. Coaching Institutions and Online institutions mushroomed all over India, rendering Schools, Colleges and Universities thus redundant.

A process of a making education a saleable commodity, was set into motion by opening the floodgates of privatization. Now corporate capital regulates education. According to Higher Education Survey Report 2017, India has 864 Universities and 40,026 Colleges. Out of 864 universities, 330 are Private Universities. Standalone institutions of national importance including number of IITs and AIIMS has multiplied and reached to 100.

It ought to be noted that several patriotic Indians had set up new Universities and Schools in British India. Nanabhai Bhatt Established Lok Shiksha (Peoples Education) in Amla village in Bhavnagar District of Gujarat. Later he established Lok Gram Bharati Vidyapith at Sanosora. Rabindranath Tagore had created wonderful university called Visva -Bharati at Santiniketan in West Bengal. Pandit Madan Mohan Malaviya established Kashi Hindu University at Banaras. Sir Syed Ahmad Khan established Aligarh Muslim University at Aligarh. Jamia Millia Islamia in Delhi came later. Mahatma Gandhi had established Gujarat Vidyapith in 1918 at Ahmadabad. All these symbolized quest for new democratic education system in opposition to the colonial British Education System.

Question arises: What is status of Science and Technology (S&T) in India today? Is India now self-reliant in S &T? Is Indian S&T superior to European, American and Chinese Science? What is the quality of science Of Nature Human-society in India today? Is science education and research good in India? Is Indian S &T superior or equal to China, USA and Europe? If not, what is wrong with it? What about generation and utilization of scientific manpower? Is the environment for teaching and research in Universities/College/Research Institutes more congenial as compared to 1965-1970. All these and many more questions demand a dispassionate critical and objective appraisal of current science and technology in Democratic Republic of India.

Did India choose a right path just to follow what is happening in western part of world? What about millions of people who are still working hard to meet two meals, shelter, cloth, education, health and dignity of self. Has our scientific endeavor attempted to solve the problems of poverty? Has our science and technology transformed the means of production and distribution in rural areas,? Has our social science addressed the problems



through democratic governance? Has our body politics ensured dignified life to women and downtrodden? Is law and order protecting life of weaker sections?

Indian Social Science Academy and Bengaluru Central University, therefore, propose to initiate a process of critical appraisal of current science of Nature-Human-Society in India during its 43<sup>rd</sup> Indian Social Science Congress.

### 0300 NECESSITY

Question arises: What is the necessity for such a massive exercise?

Indian Social Science Academy has published many books based on deliberations at Indian Social Science Congress. Some of these are: **Impact of Science and Technology, Social Perspective of Development of Science, Generation and Utilization of Indigenous Science and Technology, Microprocessors and Information Technology, Emerging Interfaces of Social Science and Public Policy In India**, etc. What appears is alarming,

(a)- Quality of research in all subjects of science and technology is declining day by day, It is also devoid of power solving the problems of people at large. It is more focused on verifying/initiating what is being done in developed part of world.

(b)-School and University Education systems are in deep crisis. Almost all government schools and Universities are now without required number of teachers and administrative staff.

(c)-Critical mass of creative scientists necessary for the country of India is now very low.

(d)-Thousands of Ph.D holders are either unemployed or working as a contract teachers. Some are willing to work as fourth grade employee, which too is not available.

(e)-UGC supported Advanced Study Centres have either been closed or are on the verge of closure.UGC too is faced with closure. The great universities like Banaras Hindu University and Visva-Bharati are dying.

(f)-Almost all Indian Industries continue depending on foreign science and technology even after 70 years of India's independence. Programmes of digitization of India and 'Make in India' are based on imported technology. Bullet train, passenger and fighter planes are imported. Despite huge establishment of DRDO, Indian Defence System continues depending on imported weapons heavily. Even small service products like trolleys at all airports are imported. Though Indian people make all kinds of mats, yet mats for yoga are imported. Even Statues have to be made by foreign sculptures. Crores of youth holding B. Tech, M. Tech degrees are on the road. Parliament seems to be sleeping at its 1958 SPR resolution. If Science and Technology in India has grown as expected, how to explain that only 101billionaires control over 15% of GDP and bottom 50% have only 5% of GDP of India and Indian Poverty?

(g)-A new virus of appointment of Vice-Chancellors and Teachers on payment has emerged.

### 0400 OBJECTIVES

Tentative objectives of the proposed deliberations on "Current Science of Nature-Human-Society in India" are as follows:

- 0401- To undertake a critical appraisal of researches in all subjects of Science of Nature-Human Society in India.
- 0402- To assess the quality of researches in all subjects of Science in India.
- 0403- To determine the new theory and methods discovered by Indian Scientists.
- 0404- To assess the funding of research in all subjects of science and technology.
- 0405- To evaluate the quality of science education in Schools, Colleges and Research Institutes.
- 0406- To investigate novelty and creativity of research in CSIR, ICAR, ICMR, ICSSA, ICPR, ISER, NISER, AIIMS, PGIs, Medical Universities/Institutes.
- 0407- To understand the nature and quality of World Science today.
- 0408- To investigate the Congeniality of environment for education and research in Indian Universities and Institutes/Laboratories.
- 0409- To determine the impact of alien language on creative education and research.
- 0410- To find out the status of utilization of new scientific and technological knowledge generated by Indian Scientist and Technologists.
- 0411- To assess the contributions of IITs/NIITs/Engineering Colleges to discovery of new technology relevant to the developmental needs of India and its peoples.
- 0412- To examine indigenous S & T base of Indian Industries.
- 0413- To assess the nature of placement of Ph.D. holders as well as M.TECH/B.TECH/MBA holders.
- 0414- To investigate the bond between scientists/technologists and the people.
- 0415- To explore the connection between growth of S&T and growth of poverty, unemployment, diseases, etc
- 0416- To suggest a way out.
- 0417- Any other

#### **0500-MAJOR THEMES**

Following major themes of the focal theme 'Current Science of Nature-Human-Society' are suggested for consideration:

1. Science of Nature-Human-Society in British India
2. Science and Technology Policy vis-à-vis National Goals of Democratic Republic of India
3. Growth of Universities, Research Institutes, IITs, IIITs, AIIMS and National Laboratories/ R&D Organizations in India, Advanced Study Centres, etc.
4. Nature of democratic Congenial Environmental for Research and Development.
5. Discovery of New Science of Nature-Human-and Society in Democratic Republic of India
6. General and utilization of Indigenous Technology
7. Current Status of Science of Nature-Human-Society in India
8. Indigenous Science, Technology and self-reliant Growth
9. Contribution of Indigenous Science and Technology to liberation of India from Hunger, diseases, poverty, unemployment, etc
10. Connections between Indigenous Science and Technology and National Policies
11. Impact of 'Brain-Drain' on growth of Indigenous Science and Technology
12. Alienation of Science, Scientists and technology from Nature, Society and People

13. Impact of English Education on growth of indigenous Science of Nature-Human-Society
14. Science of Real World vs Science of virtual world
15. Contribution of Science to resolution of conflicts and violence
16. Science communication and Scientific Temperament
17. Indigenous S&T Industry and Agriculture
18. Utilization of creative energy of young Scientists
19. Science Academies, Science Associations and Indigenous Science and Technology
20. Science education in Schools, Colleges and Universities
21. What ails science in India?
22. Results of Politicizations of Science
23. India's Dependence on imported Technology
24. Social Imperatives of Science
25. Any other

**0600: THEMES OF INTERNATIONAL/NATIONAL SEMINARS  
SYMPOSIA/SEMINARS/WORKSHOPS/COLLOQUIA**

It is proposed to organize as many national/international Seminars/Symposia/Workshops/Colloquia on the themes of greater relevance to science, technology and society as possible. Themes for all subjects Research Committees will be decided through collective discussion. All are invited to put forward their suggestions, a few suggestions are mentioned below:

**0601: Special National Symposium:** As per proposal of the Bengaluru Central University it is proposed to organize a special National Symposium on 'Social Imperatives of Science' during the XLIII Indian Social Science Congress. It's details will be worked out by Bengaluru Central University.

**0602: NATIONAL/INTERNATIONAL SEMINARS/SYMPOSIA**

Following themes are suggested for International Symposia/Seminars as:

- (I) World Science Today or Frontiers of Science and Future of Societies
- (II) World Health Science and World Peoples Health Today
- (III) World Science and Liberation of World from Poverty, Hunger, Diseases and War
- (IV) Current Space Science, Technology and Society

**Part I****PLENARY PAPERS****ON****CURRENT SCIENCE OF NATURE-HUMAN-SOCIETY IN INDIA****0114001 BABA, M. SAI (School of Natural Science and Engineering, National Institute of Advanced Studies, Indian Institute of Science Campus, Bengaluru-560012). ARTIFICIAL INTELLIGENCE: PROMISE, PERCEPTION AND PREPAREDNESS**

There is no aspect of human life that is untouched by science and technology in some form or another. High technology products and services are no longer the luxuries of the rich. Although the public perceives science as the provider of the solutions to enhance the quality of life: Novel technologies are not always welcomed by the layperson and political fraternity (policymakers). Artificial Intelligence (AI) is identified as one of the emerging technologies which would have bearing on the lives of the people and society in the coming years. In the past, AI has been employed in automated perception, learning, reasoning, and decision making and has become part of our lives. Smartphones one uses understand speech, recognize the faces of the pictures taken. AI enables providing the search results to millions, enables real-time language translation, aids in cars in driving themselves and is helping physicians identify high-risk patients.

While AI has the potential to provide large incremental value to a wide range of sectors, adoption till date has been driven primarily from a commercial perspective. Technology disruptions like AI are once-in-a-generation phenomenon, large-scale adoption strategies, especially national strategies, need to strike a balance between narrow definitions of financial impact and the greater good. Where the full potential of AI is realised in pursuance of the country's unique needs and aspirations. The strategy should strive to leverage AI for economic growth, social development and inclusive growth. Application of AI in the sectors like Health, Agriculture, Transportation and Education would impact the society towards enhanced growth.

As the R&D relating to AI is making major strides, it is important that the research is oriented towards resulting in the enhancement of the quality of life in the society. It is also important to keep the public informed about the developments and the likely impact of AI on society. Government and Media have started extensive discussions on the impact of AI on our society. In its nascent stage, AI evokes mixed responses and there is a need for addressing them and to enable society to make informed decisions. Many argue that if the present level of advancement in AI continues, machines will become super-intelligent and be difficult to control. Several such concerns need logical discussion to be held with a wide cross-section of people of the society including the general public to take stock of the developments and the implications. There is a need to focus on arriving at the methodologies of creating awareness among the public to enable them to absorb the rapidly developing technologies to enable them to make informed decisions. Some of the results of the survey conducted [1] on how AI is perceived by the general public would be presented. The survey covered topics ranging from the source of information about AI to its expected impact on education, agriculture, defence, finance etc. Also, the factors influencing trust and adoption of AI, the role of government in terms of the regulation of AI machines, mitigation of mishaps etc.

**0124002 BHORASKAR, V. N; DHOLE, S. D AND HONG, S. W (Department of Physics, Sungkyunkwan University, Republic of Korea). RECENT DEVELOPMENT IN NUCLEAR TECHNOLOGY AND ITS BENEFITS TO SOCIETY**

The recent developments in nuclear technology have significantly contributed in a number of fields but the impact in medical, industrial and, agricultural fields is astonishing. Moreover, it has improved the quality of human life and national economy. In the country, radioisotopes and accelerator based radiation sources, including nuclear

reactors, are operated and used under adequate security, shielding and by taking all the required safety measures, rules and precautions in to considerations. The required precautions and safety measures taken by the government agencies in the operation of nuclear radiation sources and the beneficial applications of nuclear technology are hardly discussed in the society. In the present paper some of the recent developments in nuclear technology and their benefits to society are discussed.

### **[1] Introduction:**

The technology based on utilization of nuclear radiation and reactions for the benefit of mankind and society, called nuclear technology, has contributed significantly in the development of society and human health care. Nuclear radiation and reactions play an important role in the universe as well as for the survival of humans, animals and living species all over the world. On the earth, the Sunshine during the day and the beautiful stars in the sky originate from process of nuclear fusion reactions. Similarly, naturally occurring radioisotopes exist in the Earth and atmosphere. However, barring events in which persons were exposed to nuclear radiation unknowingly or under radiation related accidents, so far no serious effects of nuclear radiation on common public have been observed. The internal heat of the Earth is caused by radiation from natural radionuclides and responsible for keeping the core of the Earth in liquid state

In general, all over the world public read, hear as well as watch on television frightening news about destructive nature of nuclear radiation and technology. Most of the peoples believe that the nuclear radiation is dangerous and therefore the nuclear related activities should be banned and all the nuclear installations should be closed in each country. The generation of electric power through nuclear reactors has several advantages as compared to other means of power production. Moreover, in each country nuclear reactors are operated by following international rules and regulations related to safety and protection.

The recent developments in nuclear technology have significantly contributed in a number of fields but the impact in medical, industrial and, agricultural fields is astonishing. Moreover, it has improved the quality of human life and national economy. The nuclear radiation emitted by radioisotopes are utilized by a number of industries for various applications, such as for safety, improving productivity, and quality control. In addition, the nuclear technology is being used in chemical engineering, materials analysis, measuring devices, process controls, oil and mineral exploration, pollution control, detection of explosives, elemental analysis, etc.

Nuclear technology has also contributed in the development of various diagnostic and therapy processes for the treatment of different types of diseases. Using special types of radioisotopes, it is now possible to study of functions of human organs through nuclear imaging technique. For the treatment of cancer tumors, in addition to the use of external radiation sources, the recently developed targeted nuclear radiation therapy has been a boon to the society.

In the areas of agriculture, nuclear technology is used to improve food crops, preserve food, and control insect pests. In addition, radiation plays an important role in the measurements of soil moisture content, erosion rate and the efficiency of fertilizer uptake.

For the last few decades, the process of food preservation as well as increasing self-life of fruits and vegetables, by causing delay in delaying ripening period, are being carried out very effectively involving nuclear technology. It has helped in reducing the wastage of food grains from spoilage, particularly in the countries having hot and humid climatic conditions.

In several countries, inspite of the widespread use of insecticides, the losses of crops due the insects are still alarmingly high.

For saving the agricultural crops from insects, nuclear radiation technology has been found effective in controlling the population of insects in the fields including moths, screwworm, tsetse and various fruit flies. For the plant mutation breeding, seeds and cuttings of plants are exposed to nuclear radiation. This process essentially enhances the natural process of genetic mutation and therefore reduces the duration required to attain maturity. In a

few countries, using nuclear technology, new varieties of plants and crops have been developed, in addition to enhancement in agriculture yields.

In this paper societal applications on nuclear radiation and technology in different fields are discussed and benefits derived by the society are reviewed.

## **[2] Development in Nuclear Radiation Technology in different fields:**

From time to time, different techniques have been developed by utilizing characteristics of nuclear radiation and radioisotopes. Some of the important and the recent developments in nuclear technology and their benefits to society are discussed below;

### **[2.1] Medical Field:**

Different types of radioisotopes are extensively used in the therapy of cancer tumors in addition to for the study functions of various human organs.

Recently developed targeted radiotherapy has tremendous potential for treating cancer patients. A number of radiopharmaceuticals have been developed with the capability of direct targeting the cancer tumor in human body. The required radiopharmaceutical is prepared by mixing a radioisotope with other drugs and chemicals.

In this method, a radioisotope, having relatively short-life and decays by emitting alpha-particles or beta-particles, is attached to a biologically active molecule, which has a high affinity for binding to receptors on cancer tumors. The emitted alpha or beta particles deposit energy in the tumor and kill the cancer cells which are close to the radioisotope.

For the radiation therapy, the commonly used radioisotopes are iodine-131, yttrium-90, and lutetium-177. The targeted radiotherapy therapy has been found very effective in treating some specific cancer tumors.

Over the past few decades, advances in the development of nuclear imaging technologies have enhanced the effectiveness of health care and enabled physicians to diagnose different types of cancers, cardiovascular diseases, and neurological disorders in their early stages. These imaging techniques are noninvasive and provide information about the function of some of the major organ system of human body. The important nuclear imaging techniques are positron emission tomography (PET) and single-photon emission computed tomography (SPECT), and are highly sensitive probe for studying functions of some organs. Some of the radioisotopes are used for imaging as well as for the treatment of diseases. For example, I-131 radioisotope is used for the imaging and treatment of thyroids, hyperthyroidism and recently lymphoma. In general, the radioisotopes lutetium-177, iodine-131 and yttrium-90 are used for radiation therapy, whereas fluorine-18, gallium-67, indium-111 and thallium-201 are used for nuclear imaging

### **[2.2] Gamma-rays and Neutron Radiography:**

#### **[2.2.1] Gamma-Ray Radiography.**

The internal structure of objects which are opaque to visible radiation are studied by X-rays and gamma-rays through photography technique, called radiography. The X-rays and gamma-rays are electromagnetic radiation and can pass through solid, liquid and gas medium, however with attenuation in intensities.

The radiography is a well-established technique and being used in industries for the last few decades. Radiography is a non-destructive testing method that uses gamma rays or X-rays for recording images of the objects for detecting defects in casting, on- uniformity in wall thickness, imperfections in welded joints, as well as detecting defects in pressure vessels. This technique is suitable for inspecting objects made of relatively high atomic number materials, such as iron, steel, copper, silver, tungsten, etc. In Radiography testing the object to be inspected is placed between the radiation source and photographic film.

The X-Rays or gamma-rays emitted from the source will pass through the object and finally on the photographic film. The exposure time is decided by the intensity and energy of the radiation emitted by the source, the distance between the source to film, the thickness, density and atomic number of the material of the object being investigated and the speed of the film. The obtaining maximum information about the internal defects of the object from the radiograph, the exposure period must be large enough to allow sufficient number of radiation photons to penetrate the thickest part of the object and reach the photographic film to produce a good density image on the film when developed.

The intensity of both X-Rays and gamma-rays is continuously attenuated during penetration along the trajectories in a medium, which can be described by well-known mathematical expressions. The thickness of any assembly under inspection should be therefore smaller than the range of gamma-rays or X-Rays in that medium. Small changes in thickness and density of the object material have a significant effect on the intensity of the penetrating gamma-rays or X-Rays. The defects, cracks or bubbles in the object changes the intensity of the gamma-rays or X-Rays and according the radiographic image is made of brighter and darker areas on the photographic film.

In a medium, the penetration range of X-Rays and Gamma-rays X-Rays depends on the energies of the radiation and atomic number of the medium. However, the X-ray generators produce X-Rays of maximum energies around 450 keV, whereas the gamma-rays of 100keV to a few MeV are available from radioactive sources of small sizes. The choice of X-rays and gamma-rays for the radiography is therefore made on the basis of the material and dimensions of the object to be inspected. Moreover, the use of gamma-ray radioactive sources is relatively easy because it occupies very small volume and no electronic and mechanical machines are required to produce gamma-rays. Moreover, as compared to X-Ray equipment, gamma-ray sources are much cheaper, required no maintenance cost and portable under appropriate shielding. In industries, the gamma-ray sources are therefore preferred over X-rays for radiography required for inspecting internal defects such as blowholes and cracks in metal casted jobs, welded assemblies and other heavy engineering structures. The commonly used gamma-ray sources are cobalt-60, iridium-192, tantalum -182, caesium- 137 and thulium -170.

Out of these sources, the isotope iridium 192 has been found to have many advantages over other sources. For obtaining good quality and high resolution radiographs, the diameter of radiation sources is kept in the range of less than 1 mm to 4 mm for recording radiograph of objects of thickness around 50 cm. Radiography using conventional photographic film is relatively expensive due to the cost of the film, chemicals required for film processing, etc.

At present radiography based on electronic methods are used which include Real Time Radiography (RTR), Computed Radiography (CR), Computed Tomography (CT) and Digital Radiography (DR). In Computed radiography (CR), instead of conventional photographic film, electronic devices are used to record the image of the object using the same conventional radiography exposure equipment. Moreover, the recorded radiographic image can be viewed on a computer screen without any chemical or physical processing. Similarly, in the computed Tomography (CT), is a radiographic technique in which cross-sectional and 3D images of the object under investigation are provided. These images have greater definition and higher resolution, enabling detailed analysis of the internal structural and defects. The quality of the recorded radiographs is converted into a numerical value, using image Quality Indicators" (IQI) as per international standards.

The Image quality indicators consist of a series of wires of increasing diameters, or a series of small plates of different thicknesses, with holes drilled in them of increasing diameters. The image quality of a radiograph is defined as the number of the thinnest wire that is visible in the recorded photograph. There are set international guide lines for industrial radiography, being followed all over the world, however, some minor variations exist in defining the quality index of radiographs.

Presently, radiography technique is routinely used for non-destructive testing of concrete blocks, different types of welds joints in gas and water pipelines, storage tanks and structural elements. With the development of

recording high quality radiographs, it has become possible to identify internal cracks and defects of extremely small sizes that may not be otherwise possible to identify with any other technique. These special characteristics of radiography have made non-destructive testing a key tool for quality control, safety and reliability for aircrafts, satellites, missiles, ships, railway, and such other industrial fields.

### **[2.2.2] Neutron Radiography.**

Thermal neutron radiography has been developed for the detection of the objects containing explosives stored in trucks, containers or passenger luggage. The thermal neutrons can pass through heavy elements, but absorbed by low mass number elements such as hydrogen, boron and carbon. The neutron radiography technique is similar to X-Ray radiography, in which the X-Ray source is replaced by a thermal neutron source.

For neutron radiography direct exposure and transfer method are used for recording neutron radiograph. In direct exposure method, the photographic film is placed in close contact with the converter, made of thin sheet of gadolinium or dysprosium. The converter and the photographic film together are kept behind the object to be radiographed. Thermal neutrons are incident on the object for radiography. The thermal neutrons pass through the high z elements but absorbed or scattered by low z elements present in the object. As per the distribution of low and high z elements in the object, the converter film becomes radioactive on the locations bombarded by neutrons and emits electrons, which directly fall on the photographic film. The variation in the intensity of the electrons on the photographic film produces image of the internal structure and distribution of low and high z elements in the object. The irradiated converter sheet is removed and put on a photographic film. The electrons emitted from the radioactive areas produce image of the object, which can be seen after processing the film.

The neutron radiograph is used to find the defects and cracks in addition to distribution of low z and high z elements in the object, using standard methods. Neutron radiography is very power technique to identify hidden explosives in a container made of high z material. Similarly, it is widely used for the testing of turbine blades used in aircrafts, several components used in satellites, nuclear reactor, etc. Since neutrons can penetrate high-density material in a way that X-rays cannot, neutron radiography is widely used for testing critical aerospace components with thick outer shells, such as turbine blades and energetic fuses, which are difficult to inspect using X-rays. Neutrons can also be used to detect water and moisture within components, as well as archaeological specimens encapsulated in material that X-rays cannot penetrate.

### **[2.3] Detection of Explosives by Neutron Activation Analysis.**

A number of countries, including India, are facing problems related to use of different types of explosives for mass destruction by antisocial persons. Though there are some well known methods being used to detect explosives, however, detection of landmines remains a challenge before the society for the last several decades. Even today, in many countries explosives are being used for targeting defense and security personnel, and therefore pose threat to national security for many countries. Identification of explosives by X-Ray scanning techniques has its own limitations and moreover becomes ineffective for inspecting large size and heavy steel containers at check posts. Interrogation by high energy gamma ray imaging method is effective for goods containing heavy elements, but not a viable solution for detection of explosives made of low mass elements. It is therefore rather difficult to detect explosives stored in container of steel or lead by gamma-ray imaging technique, because most of the explosives are made of low-Z elements such as carbon, nitrogen, oxygen, chlorine and aluminum. Even today, identification of explosives and contraband materials hidden in cargo containers is therefore a challenge before national security agencies of our country. Similar problem exists for the detection of landmines hidden under public roads and other remote areas. Neutron based techniques for identification of explosives provides solutions for these problems. Prompt neutron activation analysis techniques based on neutrons provided by indigenously developed 14 MeV neutron generator was developed and successfully used in the Department of Physics, S.P. Pune University, Pune, for the analysis of explosives at laboratory scale.

Neutrons of 14 MeV can be obtained using a portable small accelerator. When an explosive sample is irradiated with 14 MeV neutrons, the radioisotopes of elements present in the explosive, namely carbon, oxygen,



nitrogen, chlorine and aluminum are produced through nuclear reactions. The respective radioisotopes emit prompt gamma-rays characteristics of elements. By analyzing the spectrum of these prompt gamma-rays recorded by NaI (TI) detector coupled to electronic systems, it is possible to identify whether the material in the cargo container is explosive or not. This is a very powerful and effective method to identify the explosives, including landmines hidden below public roads and remote areas.

#### **[2.4] Sterilization of medical devices and consumables.**

Gamma irradiation is a physical means of sterilization single use disposable and reusable medical devices required in hospitals and other places for health care. The basic principle involved is that medical devices, both disposable and reusable, already packed in plastic or cardboard boxes are irradiated with gamma-rays or electrons at a preset radiation dose. Gamma-rays or bremsstrahlung pass thorough the packages. In the process of irradiation, the DNA of bacteria are damaged and therefore bacteria are killed, inhibiting bacterial division. Similarly, pathogens responsible for causing contamination are also destroyed during irradiation. The process of irradiation does not create any kind of radioactivity in the irradiated samples made of solid, liquid or gas. Now a day, the processes of irradiation with gamma-rays and bremsstrahlung are considered as principal methods of sterilization and routinely used in industries.

The main advantage of this method is that all the medical products such as devices, raw materials and disposables, even fully packaged or sealed in plastic or cardboard boxes can be sterilized all together without physical handling. Moreover, this process of sterilization is safe, reliable, and highly effective for treating items required for human health care. All over the world, in several countries disposable medical products, such as syringes, hypodermic needles, scalpels, surgical blades, adhesive dressings, surgical gloves, cotton, dressing materials, etc. are sterilized using gamma-rays from Co-60 radioactive source or electrons and bremsstrahlung radiation using electron linear accelerator. In addition, reusable small surgical tools such as knife, scissor, fork, cutter, etc., are also sterilized using suitable radiation source. The standards for radiation sterilization of medical products, outlining rules for the validation methods, quality controls and sterilization processes, are set by the International Organization for Standardization, 1995. If required, these standards are modified by the international organization.

#### **[2.5] Irradiation of Food and agricultural products.**

Food sterilization by irradiation is a technology that improves the safety and extends the shelf life of foods by reducing or eliminating microorganisms and insects and therefore make food safer for human consumption. An International body, called, Food and Drug Administration is responsible for regulating the sources of radiation that are used to irradiate food.

The main objectives of food irradiations are as follows;

(i) Inhibit sprouting in potatoes, onions, yams, garlic, (ii) delay in ripening of strawberries, potatoes, banana, (iii) prevent insect infestation in grains, spices, cereals, coffee beans, spices, dried nuts, dried fruits, dried fish, mangoes, papayas (iv) extend shelf-life of fish, seafood, refrigerated and frozen food items and (v) reduce the risk of pathogenic and spoilage microbes in spices, poultry products. And meat. In many countries, to prevent the spread of pest and diseases across borders it is mandatory to sterilize fruits and vegetables before exporting to other countries. Irradiation of food items by gamma-rays from Co-60 source or electrons of 2 MeV does not make any food item radioactive. However, marginal changes in the food quality may occur in terms of nutritional contents, taste, texture, and appearance of food. It is difficult to make out if the food is irradiated just by testing, as the changes made are at minimal level.

As per the international rules, each packet containing irradiated food for human consumption must have a sticker of the international logo for irradiation, called Radura, along with a written statement "Treated with radiation" or "Treated by irradiation". Bulk foods, such as fruits and vegetables, are required to be individually labeled or to have a label next to the sale container. Irradiated foods need to be stored, handled, and cooked in the

same way as non-irradiated foods, because they could still become contaminated with disease-causing organisms after irradiation if the rules of basic food safety are not followed.

The Radura logo, is used as a symbol to show public that the items packed are irradiated with gamma-rays or electrons. The FDA has evaluated the safety of irradiated food for more than 30 years and has found the irradiated food is safe for human and animal consumption. The World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC) and the U.S. Department of Agriculture (USDA) have also endorsed that the gamma-ray and electron irradiated food is safe for consumption by human and animal consumption.

## **[2.6] Electric Power Generation by Nuclear Radiation.**

Radioisotopes are used for generating electric power, using two methods; (i) radioisotope thermoelectric power generation and (ii) battery based on collection of charge from radioisotope.

### **[2.6.1] Radioisotope Thermoelectric Generator.**

Radioisotope thermoelectric generator is an important low power source for applications where conventional electric power, including solar energy, is not available. Examples of such situations are undersea mission, space missions, isolated location on high altitude mountains, flashing light buoy's, lighthouses etc. Radioisotope thermoelectric generator is an electrical power source based on conversion of heat energy into electric energy, based on well-known Seebeck effect. Radioisotopes emit nuclear radiation namely beta particles, alpha particles and gamma-rays, of varying energies over 100 keV to a few MeV. When a small size of metal or ceramic plate is exposed to high flux of nuclear radiation such as alpha particles or beta particles of energies around a few MeV, the kinetic energy of the nuclear particles will get converted into heat energy. The temperature of the plate can rise continuously with exposure and may exceed 200<sup>o</sup> C.

Thermoelectric generator typically consists of two major components; the heat source in the form of alpha particle radioactive source and an array of thermocouples elements for transforming heat energy into electric power. In Radioisotope thermoelectric generator, the radioisotopes such as are Plutonium-238 (Pu-238), Strontium-90 (Sr-90), Polonium-210, Americium-241, etc., can be used. However, out of these Plutonium -238 offers several advantages over other sources and therefore widely used.

The working principle of radioisotope thermoelectricity is based on Seebeck effect, in which heat energy, provided by radiation emitted by a radioisotope, is converted into electric power by thermocouples. The thermocouples consist of wires of two dissimilar metals, of which one each end is joined to form a junction. The other free end of each wire is connected separately across a resistive load through electrical terminals, kept at room temperature. The junction of these two dissimilar metal wires is connected to a metal plate, which is heated by alpha particles emitted by a radioactive source, mostly Plutonium -238. After achieving a particular temperature by the metal wire junction, a voltage is generated between the two ends of the wires kept at room temperature, and therefore current flows through the resistive load. The generated voltage depends on the type of the dissimilar metals wires and temperature of the junction.

For obtaining relatively high power from thermoelectric generator, the thermocouple wires are replaced by small size p-type and n-type semiconductor rods. One rod of p-type semiconductor and other rod of n-type semiconductor are connected through a metal strip, whereas the other end of each rod is separately connected to metal strips, maintained at room temperature.

The most widely used semiconductor materials in order of increasing temperature capability, are Bismuth Telluride (BiTe); Lead Telluride (PbTe); Tellurides of Antimony, Germanium, and Silver (TAGS); Lead Tin Telluride (PbSnTe); and Silicon Germanium (SiGe). However, for practical applications, three different types of semiconductors, silicon germanium (SiGe), lead telluride (PbTe) and bismuth (Bi<sub>2</sub>Te<sub>3</sub>) telluride in the form of rods or strips, are commonly used for thermoelectric generators. The power output of a Radioisotope Thermoelectric

Generator is increased by connecting a number of p-type and n-type rods electrically in series and parallel combination to obtain maximum electric power.

A Radioisotope thermoelectric generator has efficiency around 5-8% for current generation and therefore the continuous power output is limited to 110 to 120 watts, under optimum operational conditions. For the first time a Radioisotope Thermoelectric Generator was used in the Voyager mission in 1977. Similarly, during the last fifty years the Radioisotope Thermoelectric Generators of different designs have been used successfully in a number of monumental and historic space missions such as the Apollo missions to the moon, the Viking and Curiosity missions to Mars, the New Horizons mission to Pluto and the Kuiper Belt and the Cassini mission to Saturn.

### [2.6.2] Nuclear Battery.

Another important contribution of nuclear radiations lies in its application involving the development of Nuclear Batteries. These are devices which use energy from the decay of radioactive isotopes to generate electricity. Basically, it converts the energy from radioactive decay into electrical energy, in contrast to the conventional batteries, where the chemical energy is converted into electrical energy. Radioactive sources continuously emit nuclear radiation like alpha, beta or gamma radiations, which is effectively used to generate power in nuclear batteries by converting charge into electric energy. A typical nuclear battery has a lifetime of at least twice the half-life of the radioactive sample used. If the half-life of radioactive sample, for example, Tritium is 12 years then the battery developed using it can be used at least for 24 years. Compared to other batteries they are very costly, but have an extremely long life and high energy density, and so they are mainly used as power sources for equipment that must operate unattended for long periods of time, such as spacecraft, pacemakers, underwater systems and automated scientific stations in remote parts of the world. Over the last several years, attempts are being made to develop different types of nuclear batteries particularly for low electric power applications. Advancements in nanotechnology and electronics require next generation power sources of the order of micron size that can provide long service life. Thus there is an ever increasing demand for micro-scale energy systems to supply power to majority of micro electromechanical systems (MEMs) devices, such as remote MEMs sensors and implantable medical MEMs chips, which are required for long term operations.

In the S.P. Pune University, Pune, four types of nuclear batteries have been successfully designed, fabricated and used for low power applications.

Each battery can provide continuous power capacity around a few  $\mu\text{W}$  power for more than ten years. These batteries are (i) Direct Charge Collection based on charging semispherical and hemispherical capacitor by beta particles (ii) Beta-Voltaic based on Schottky Junction type batteries using microcrystalline as well as nanocrystalline SiC, and nanotubes of  $\text{TiO}_2$  (iii) Schottky Junction type batteries using  $\text{TiO}_2$ : Sandwiched structure using  $\text{TiO}_2$  arrays on Ti foil with radioisotope  $\text{Sr}^{90}$  planar source on Ni substrate (iv) Photovoltaic Nuclear Batteries using light from Tritium radioactive source and photovoltaic solar cells.

### [2.7] Other fields.

The nuclear technology is being used in several other fields, such as polymerization, chemical engineering, materials analysis, measuring devices, process controls, oil and mineral exploration, pollution control, paint technology, smoke detection, dating of ancient objects., however, these fields could not be covered in this paper.

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**0124003 BURTE, PRAKASH (Flat No 2, Building No. 7, Rahulnagar, off Karve Rd., Konkan Express Lane, Kothrud, Pune). GDP FETISHISM STRANGULATES DEMOCRACY, SUSTAINABILITY AND HUMAN DEVELOPMENT**

Many economists give Gross Domestic Product (GDP) far more credit than it deserves. They tend to consider fiscal and monetary policy to be positive if these policies increase GDP. Unfortunately, they often fail to ask, whether the same policies increase or reduce welfare. Giving GDP such a sacred place is a typical symptom of 'GDP fetishism'. The paper then explores the impact of GDP fetishism on democracy and sustainability of the very human existence. This exploration shows many instances of such a GDPism strangulating the very human existence caused by Global warming aslo. The process of such strangulation is mediated through skewed income distribution leaving large part of the Indian population helpless in the face of globalisation. The paper discusses ways out of this morass as suggested by world-renowned thinkers to achieve human development beyond GDP fetish. Lastly, the paper concludes with emphasising that an understanding avoids GDP fetishism will help to carry out better economic analysis, and propose better policies for welfare of society.

The title of this paper written in 21<sup>st</sup> century naturally assumes that the "rise of capitalism" is crucial and it has taken place. However, the rise of market economy is not a natural extension of basic instincts of human beings.

It is not a simple linear evolution from the desire of the very earliest homo sapiens of enlargement of their horde to a desire for a constant GDP Growth by the homo sapiens of 21<sup>st</sup> century.

During much of the human story of around 300,000 years, societies were nomadic or semi-nomadic, and organized only for the food eventualities of say few days and not more. The larger food storages would have been a barrier to their mobility essential to search food. The measures that such societies used to reduce the risks of scarcity centered on knowledge of the environment, and interpersonal relationships to share the resources. In extreme scarcity, using muscle power also might be a norm. The concept of “Growth of Food Resources” was not at all on their horizon.

After the discovery and spread of agriculture some 10 to 12 thousand years back, humans started settling. It was Mesopotamia (modern Iraq) where agriculture first evolved in Eurasia and then spread westward across North Africa and Europe and eastward to the Indus River Valley. With spread of agriculture Homo sapiens settled in agriculture villages. They invented few forms of division of work, experimented with kingdoms and wars. In this period, storage of grains and domesticated animal for meat and milk became a practice. Farmers occupied nearby lands, some tax (mostly in the form of grains) was extracted in return for the protection given by the kings, merchants amassed wealth by way of trade, and rulers extended their domains just like farmers increased land size. Merchants traded mostly in barter system and then converted the wealth in to the form of precious metals or stones after invention of ‘money’. The oldest discovered metal, Gold, achieved importance as a measure and status of a king’s and trader’s wealth. Major religions arose in this period (none of the major religion is older than around six thousand years). At least 70 percent of British India, until first half of 20<sup>th</sup> century, was living in agricultural villages and agriculture was a major economic activity. Of course, many of the artisan skills were rooted until then. In this second longest period dominated by agriculture as an economic activity, the Global human population for the first time is estimated to have crossed the limit of one billion (100 *crore*) in CA 1804.

#### **Rise of Capitalism:**

However, the story of Europe had taken much different turns. The enchanting Sindbad or the famous Gulliver is of course the fictional sailors for whom the wonders of the distant lands were always waiting. The authors portrayed them as courageous men battling with Seas and unknown humans. The base of the stories is a period consisting of risky travels of European mercantilism. Mercantilism thrived under the shadow of empires helped by the religions that preached peace. There were of course wars, but they resulted in creating larger kingdoms or big empires, within which peace prevailed. Of course, around 5th century the decline of widespread mercantilism in Europe was a reality. Later another centre arose in Arabia. Arabs were predominantly Islamic and geographically well situated for profit as goods moved along Middle Eastern trade routes between Egypt, Persia and the later Roman and Ottoman Empires. The main plank of this economic system of mercantilism was that the wealth is nature-given and so was limited. One can buy and sell the goods and through that redistribute wealth. The rapid spread of Islam in the 700s brought the practice of mercantilism to Africa, Asia and parts of southern Europe. From Spain and Portugal, mercantilism spread to the rest of Europe.

#### **No limits to Growth:**

From 14<sup>th</sup> to 19<sup>th</sup> century, Europe experienced the upheavals caused by renaissance, age of discovery, industrial revolution, period of European colonialism and modern science. From the perspective of ancient and medieval Western civilization, the known world extended from northern Europe to the Sahara Desert, from the Atlantic Ocean to India and to some extent China. When Columbus discovered America, it was naturally called “New World”. Initially, the foremost motivation for these efforts was the search for overseas trade routes with India and China. Amongst the European kingdoms, Portugal initiated the global exploration and empire building. Earliest to join the race was Spain followed by Britain, France, and Netherlands. On many voyages, a Captain for the ship, the crew and armed men to fight pirates used to be present, but in addition many missionaries, few curious scientists, and people from other disciplines also accompanied these sea voyages. Only during the nineteenth century, Britain became the naval superpower. In this phase, coal was discovered. Soon the coal was running the ginning and weaving mills, supplying energy to the newly developed engines of the boats and was rotating the wheels of European

railways. The motivation in this period was to get control on cheap raw material and external markets. In 18<sup>th</sup> and 19<sup>th</sup> century, Europe arrived at a realization that nature or God is not the reason of wealth; wealth is the result of human labour and ingenuity and since human ingenuity has no limits and every new machine replaces human labour, there exists no limit to wealth. That was a human centric concept of economic system. This period experienced births of many ideologies where human being is always at the center. Naturally, the Sikh religion, formed in 1469 by Guru Nanak was the last of the world's major religion.

#### **Measuring economy:**

The image of man's control over nature is deeply rooted in modern Western thought. It first appears in the Book of Genesis at least in two contrasting forms. In the story of genesis an ideal of garden par excellence is the Garden of Eden and equally ideal image of man is that of Adam, the God's special creation. God has trained him in heaven for his role on Earth. After the Fall of Adam to Earth, he is trying to mimic the same role of creating an order in nature for his own welfare. The British philosopher and political leader Sir Francis Bacon sees a similar role for human beings that of control and use nature for his comfort. The European industry and the capitalist class assumed the raw materials and energy supply will not dry at all. After the fall of Soviet Union in 1991 and China adjusting to state capitalism, capitalism became the most dominant economic system in the world. Before the period of capitalism, there was no conception of 'an economy' that can grow, still less of one that tends to be infinite.

#### **Invention of GDP, the "Magic Number":**

The rise of the single statistical figure of GDP had a backdrop of First World War (WW I), followed by The Great Depression and the looming shadow of a possible still more disastrous world war. During this period the Bureau of Economic Analysis, U.S. Department of Commerce (or the Office of Management and Budget) undertook important project 'Making estimates of national income and product'. Russian born US economist Simon Kuznets is often best remembered and quoted for his creation of the U.S. national accounts. However, he received Nobel Prize (1971) for his "empirically founded interpretation of economic growth, which has led to new and deepened insight into the economic and social structure and process of development." This work under the leadership of Kuznets in the late 1930s, helped establish a modern branch of economics called 'Macroeconomics'.

In the thick of WW II, delegates from 44 nations met from July 1 to 22, 1944 in Bretton Woods, New Hampshire, USA with an objective to agree upon a series of new rules for the post-WWII international monetary system. This meeting is known as the **Bretton Woods Conference 1944**. It declared the formation of the **World Bank** (officially known as World Bank Group), along with the **International Monetary Fund (IMF)**. The World Bank started operations from June 1946. An organization named "**The North Atlantic Treaty Organization (NATO)**" as an alliance between 29 North American and European countries signed the treaty on 4 April 1949. In 1945, representatives of 50 countries met in San Francisco at the United Nations Conference to draw up the United Nations Charter. The United Nations officially came into existence on 24 October 1945 after majority of the 50 Nations ratified the charter. These organizations made GDP a catchword and put the US economy on the path of a 'Great Success'.

#### **Fetishism of Indian ruler:**

Here is a recent Indian example of GDP misuse. The story begins in the year 1991. Dr. Manmohan Singh, as a finance minister in the Narsimha Rao ministry, opened up Indian economy to the world to some extent. Later, it so happened that during the Prime Ministership of Manmohan Singh in UPA I period India achieved the average GDP growth rate of 8.1%. The UPA I also delivered the only instance of double-digit annual growth in modern Indian history for the year 2006-07. That prompted Indian leaders to look forward to becoming a "World Super Power number 3", after USA and China. That euphoria was the first Indian misuse GDP. It eventually melted during the first term of Narendra Modi government. That helped vaporize the talk of making India a world super power.

However, Modi was sworn in as a Prime Minister for second term on May 30, 2019 in a largest event the *Rashtrpati Bhavan* had ever seen. He immediately on June 15 made an announcement of a new goal that of making economy of

India worth \$5 trillion or Rs 340 *lakh crore* GDP by the year 2024. The occasion for the announcement was a governing council meeting of NITI *Aayog*. That magically became a mandate for the *Aayog*. Subsequently, the economic survey and the full annual budget tabled on July 5, 2019 incorporated a discussion on ways to achieve this ‘ambitious’ goal. Just ten days later, UP Chief Minister Adityanath trumpeted that UP has the potential to become the country’s first trillion-dollar state economy. He also emphasised that he will take this challenge to make it a reality. The slogan kept a host of economists, business analysts and lay-people busy discussing, debating and propagating the issue of making India the third largest economy in the world. However, nearly none raised a question that how a \$5 trillion worth Indian economy is going to improve the life of ordinary Indian citizen substantially. Instead, a slogan like reducing the gap substantially between the rich and poor within India would have been a good welfare measures. Above course of events was a clear example **fetishism of Indian rulers**.

### Discussion:

Joseph Stieglitz, a Nobel laureate in economics, in his recent article titled “It’s time to retire metrics like GDP” says in the opening statement, “The world is facing three existential crises: a climate crisis, an inequality crisis and a crisis in democracy.” Will we be able to prosper within our planetary boundaries? Can a modern economy deliver shared prosperity? In addition, can democracies thrive if our economies fail to deliver shared prosperity? These are critical questions, yet the accepted ways by which we measure economic performance give absolutely no hint that we might be facing a problem. These three crises warrant a serious discussion. The first section presents a criticism on GDP from many angles. The second section outlines enormity of environmental crisis leading to global warming that is posing a big question regarding sustainability of humans. The third section goes on to discuss the phase of challenges to democracy making the question of human sustainability more acute. These three topics are vast, interdependent and complex.

1. **Critique of GDP:** GDP is the total value of products (goods) and services produced within a specified Domestic boundary (normally a nation-state) in a specific period — (normally) an annum or a month or quarter as indicated, along with the data. However, the value of products and services produced and purchased for consumption gets realized only through the market. As a result, (in capitalism) market helps realize the value of every product and every service produced and purchased. Thus, market has become an essential component to register all the economic transactions to consider them for computation of GDP.

Soon after the invention of GDP, the concept became target of criticism. That is because GDP cannot consider the certain economic transactions that help introduce errors in the GDP number. The way we assess economic performance and social progress seems to be wrong, and the climate crisis has brought these concerns to the surface.

There exist many peculiarities regarding production of goods and services and their consumption in every nation. Of course, from nation to nation the extent of variation of the peculiarities does change. Rationally normalizing these differences is a pre-requisite to draw meaningful and reliable inferences.

For example, normalizing GDP for inflation in many countries involve huge data collection and resolving the problems of non-availability of data. The GDP corrected for inflation is ‘Real GDP’. Normally, per capita Real GDP, that is GDP divided by population of a country, is taken as a better measure of country’s economy size. Another tricky difference is the purchasing power parity and correcting the GDP for it. That is called GDP (PPP) and it largely assumes that people in any country can purchase same basket of products and services in the same amount of money. In short, one can say that the essential normalization processes give various derivatives of GDP. With this, the paper proceeds to narrate various criticisms on GDP.

| <b>Table -1:</b> List of few countries by the GDP (PPP) and GDP (PPP) /Capita for the year 2017 computed by World Bank. |  |                |  |                |
|---|--|----------------|--|----------------|
| <b>Country / Territory</b>  | <b>GDP(PPP) for the year 2017 (millions of current Int\$) #1</b> | <b>Rank #1</b> | <b>GDP(PPP) for the year 2017 /Capita (millions of current Int\$) #2</b> | <b>Rank #2</b> |
| World   | 12,77,23,794   |                | 16,961   |                |
| China   | 2,33,00,783  | 1              | 16,807   | 76             |
| United States   | 1,93,90,604  | 2              | 59,532   | 11             |
| India   | 1,19,48,659  | 3              | 7,056  | 120            |
| Japan   | 54,87,161  | 4              | 43,876   | 25             |
| Germany   | 41,87,583  | 5              | 50,715   | 16             |

#1 List of few countries by GDP (PPP) for the year 2017; From Wikipedia, the free encyclopedia; URL  
Ref.:[https://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_GDP\\_\(PPP\)](https://en.wikipedia.org/wiki/List_of_countries_by_GDP_(PPP))

#2 List of same countries by GDP (PPP) per capita; from Wikipedia, the free encyclopedia; URL  
Ref.:[https://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_GDP\\_\(PPP\)\\_per\\_capita](https://en.wikipedia.org/wiki/List_of_countries_by_GDP_(PPP)_per_capita) ;

The normalization is relatively simpler for period (same year) year, population of the countries and currency of the countries (accurate exchange rate). The Table -1 gives the Real GDP (PPP) and Per capita GDP for few countries. If one looks at only GDP, India stands 3<sup>rd</sup> in the world, where as because of Per Capita GDP it stands 120<sup>th</sup> in the world. The reason behind why the per capita GDP is a better measure of economies of countries is self-explanatory.

- 1.1. **Kuznets' warning:** The man behind the concept of GDP, **Simon Kuznets, had warned** that GDP was not a suitable measure of a country's economic development. He understood that GDP is not a measure of welfare. It is not a measure of how well people of a country are all doing. It just counts the products and services that we are buying and selling. David Pilling comments, "Simon Kuznets, who practically invented GDP, had doubts about his creation. He did not like the fact that it counted armaments and financial speculation as positive outputs. Above all, he said, GDP should never be confused with well-being." However, we all have totally ignored Kuznets' warning and have imparted global importance to GDP by making it a magic number.
- 1.2. Economist **Moses Abramovitz** in 1959 becomes one of the first to question whether GDP accurately measures a society's overall well-being. He further cautions that "we must be highly sceptical of the view that long-term changes in the rate of growth of welfare can be gauged even roughly from changes in the rate of growth of output."
- 1.3. **Limits to Growth, 1972:** The central theme of the report is described in the following words: 'Valuable resources are procured from nature by the input end of the economy; the resources flow through the economy, being transformed and manufactured into goods along the way; and invaluable waste and pollution eventually accumulate by the output end. The recycling of material resources is possible, but only by using up some energy resources as well as an additional amount of other material resources; and energy resources, in turn, cannot be recycled at all, but are dissipated as waste heat.' The publication shook the intellectual foundations of social theory and challenged the very premises on which modern



economy and prosperity are based. Once set in motion, it led to a revolutionary re-evaluation of human aspirations and economic activities. Among its many consequences, it has stimulated creative minds to look freshly at the underlying processes governing the wealth and welfare of nations. In a matter of one year, the report went for five prints.

1.4. **Voluntary unpaid Labour:** The first problem that creeps in the computation of GDP is that of voluntary unpaid labour. This labour produces services and products but has no value in the market. Naturally, they are not considered in computation of GDP and its derivatives. Examples of such labour are numerous :

- Doing agriculture for self consumption;
- Cooking and serving food to eat at home;
- Washing our own clothes, cleaning vessels, or dusting and cleaning own house;
- Nursing the sick children, young relatives, and old people at home;
- Taking care and bringing up children who later become next generation working people;
- Doing yoga, exercises workouts at home or in the public garden;
- carrying out variety of errands;

In real world, the list is very long. Women carry out bulk of the work from above list and indicating an existence of strong gender inequality world over, only the extent differs. If a family decides to purchase such services and products from market, citizens will have to spend more money and so earn higher income by demanding higher salary or slog for longer time at the cost of health. Thus, a choice by unorganized women of the families to provide voluntarily unpaid services and products amounts to paying subsidy to the capitalist economy. The methods, the institutions employ for GDP computation, do not acknowledge this subsidy. It is extracted silently. That introduces distortions in estimating the size of an economy, the policy decisions based on it and the gender bias.

1.5. **Evasion of Taxes:** Many times one comes across products and services that are sold and purchased without receipts with the sole purpose to avoid Taxes. In such transactions, the seller avoids paying taxes to the government and purchaser purchases products or services at lower costs. It is a 'win-win' game for both and also for few Tax collectors. But the casualty is the total tax collection by government. The much enlarged role 'Tax Heavens' play in the economy is a similar one. Both these activities are called "Black market" in popular parlance. In reality, it is a "Black hole" eating up large number of economic transactions, resulting in lowering of GDP. The methods of estimation of GDP and the institutions computing GDP do not want to voluntarily acknowledge the existence of black market and its size. These effects of tax evasions cause distortions in computing GDP, reflecting in the distortions in estimating the size of an economy and the distortions in arriving at proper policy decisions.

1.6. **Standard of Living vs. the Skewed income and wealth distribution:** Normally, per capita GDP is taken as an index for Standard of Living. Here only the material things are counted and not emotional things associated with them. In standard of living there exists neither any consideration for how useful are some of the possessions, nor do they enrich people as human beings. Within these limits it is not difficult to find an empirical relation between Per Capita GDP and standard of living in a limited range. That is because even buying more and perhaps unwanted goods and services according to the fashion of the day may not necessarily help us find true happiness, true love, or true enlightenment. Based on this assumption the advocates assume that Per Capita GDP of a nation is a good indicator of material Standard of Living. It tells how prosperous a country feels to each of its citizens.

However, a relation proved empirically valid in a limited region to be valid, generalising it as a universal statement or a law without any theoretical backing is more likely to be wrong. Not bothering about this logical fallacy, there exists a general understanding that 'Per Capita Real GDP' of a country is an all right (toned down version) measure of a country's standard of living. One can find very many such references. Earlier sub sections have already dealt with the distortion they cause in GDP

measurement due to unpaid labour and evasion of Taxes. Similarly, distribution of wealth in society, changes in the quality of life, changes in the quality of goods and services etcetera are not accounted for in the estimation of GDP. However, many authors dealing with this topic ignore these limitation even of Per Capita GDP and take that as a some what quantitive indicator of Standard of Living. They even trespass the meaning of that term and relate Per Capita GDP to terms like wellbeing, quality of life and happiness

- 1.7. **Devos annual meet, 2016:** The opening statement of the report on Devos annual meet 2016 says, “Three leading economists and academics, namely, IMF head Christine Lagarde, Nobel Prize-winning economist Joseph Stiglitz, and MIT professor Erik Brynjolfsson, at Davos agree unanimously that the GDP is a poor way of assessing the health of our economies and we urgently need to find a new measure.” That is because it measures only the size of an economy at best but not its health.
  - 1.8. **Who pays for the health effects of pollution?** : During the processes of production of goods and creation of various services many air born, water born or solid pollutants do get created. The pollutants by definition can cause related health problems. That result in expenses towards treatment, loss of working hours and loosing part of salaries as well. The health effects and the related expenses are many times out of the GDP computations. These expenses are born by citizens and helps increase the GDP causing additional errors in GDP, the magic number.
- 2 **Environmental Crisis:** In most of the production processes of goods and creation of services fuels like Coal, petrol-diesel, natural gas, and similar fuels are used. These fuels are called ‘Fossil Fuels’ because thousands of years back the biomass of forests got buried under ground. The high pressure and high temperature there converted this biomass in to these fossil fuels. A natural process called ‘**Photo Synthesis**’ is responsible for the biomass production. By this process plants produce food for self. Some animal feed on plants and others on other animals. In other words, existence of both flora and fauna is possible because of photo synthesis.

All bodies having temperature above ambient temperature radiate energy. Heat a wire of iron or aluminum or a glass rod on the kitchen gas burner. As the object gets heated it become red and then yellow etc. That is because it emits visible light. Take this object away from gas burner. The colour changes fast in reverse way. Even when the body is not emitting light, the body can be hot enough. This observation is applicable to celestial bodies as well.

The Sun is a closest hot star radiating energy in all directions, mainly in the form of visible light and a negligible fraction consisting of microwave, ultraviolet and X-ray radiations. A small fraction of this energy reaches the atmosphere of Earth based upon the Earth-Sun distance and the diameter of earth. That much energy is sufficient to warms it up. Earth either reflects or scatters back some energy it receives mainly as visible light. However, the average temperature of Earth being too low compared to that of the Sun, the energy Earth radiates has nearly single component as microwave radiation and nearly zero visible component.

The atmosphere of the Earth consists of many gases, water vapor and dust particles. Interestingly the gases like methane, nitrous oxide, carbon dioxide and water vapor in the atmosphere of earth are nearly opaque to microwave radiation but very transparent to visible light. This property does not allow microwave radiation to escape in to space. That keeps our earth warm like the traditional **Green House**. Therefore, these gases are called **Green House Gases** and the effect to keep the Earth warm is called **Green House effect**. Without the small proportion of carbon dioxide before the industrial revolution, life on the Earth would not have been possible.

During the period of the Industrial Revolution, humanity discovered energy dense Coal. The industrial revolution gave a ever increasing boost to coal mining. Slowly the other fossil fuels also started turning the wheels of mainly vehicles and to an extent industry. The Earth had stored the carbon in the form of fossil fuels in its mines and kept safe out of natural carbon cycle for thousands of years. The fossil fuels supplied the much-needed energy to the industrial revolution. The rate of coal mining and subsequently burning has been on

rise and hence the level of emitted Carbon dioxide gas in the atmosphere. The ever-rising proportion of this Green House Gas is the cause of **Global Warming**.

**2.1 Effects of Global Warming:** Climate Change due to global warming is the defining issue of our time and we are at a defining moment. From shifting season patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic corrective action today, adapting to these impacts in the future will be more difficult and costly. Following are the effects of Global warming if drastic corrective measures are not taken:

- **Melting ice:** Projections suggest that within the next 100 years, if not sooner, the world's glaciers will have disappeared, as will the Polar ice cap, and the huge Antarctic ice shelf, Greenland may be green again, and snow will have become a rare phenomenon.
- **Rising sea levels:** Average sea level around the world rose about 8 inches (20 cm) in the past 100 years; climate scientists expect it to rise more and more rapidly in the next 100 years. If the Greenland ice cap and/or the Antarctic ice shelf collapses, sea levels could rise by as much as 20 ft (6 m), inundating many of the coastal cities of the world.
- **Torrential downpours and more powerful storms:** While the specific conditions that produce rainfall will not change, the amount of water in the atmosphere will increase producing violent downpours instead of steady showers when it does rain.
- Hurricanes and typhoons will increase in power, and flooding will become more common. Anyone in the United States who has tried to buy storm and flood insurance in the past few years knows that the insurance industry is completely convinced that climate change is raising sea levels and increasing the number of major storms and floods.
- **Heat-waves and droughts:** Despite downpours in some places, droughts and prolonged heat-waves will become common. Rising temperatures are hardly surprising, although they do not mean that some parts of the world will not "enjoy" record cold temperatures and terrible winter storms. (Heating disturbs the entire global weather system and can shift cold upper air currents as well as hot dry ones.
- **Changing ecosystems:** As the world warms, entire ecosystems will move. Already rising temperatures at the equator have pushed such staple crops as rice north into once cooler areas, many fish species have migrated long distances to stay in waters that are the proper temperature for them. In once colder waters, this may increase fishermen's catches; in warmer waters, it may eliminate fishing; in many places. Farmers in temperate zones are finding drier conditions difficult for crops such as corn and wheat, and once prime growing zones are now threatened. Warming will soon fundamentally change the forests; in Europe. Hundreds of plants and animal species will disappear and hundreds more will move far away.
- **Reduced food security:** One of the most striking impacts of rising temperatures is felt in global agriculture, although these impacts are felt very differently in the largely temperate developed world and in the more tropical developing world. Different crops grow best at quite specific temperatures and when those change, their productivity changes significantly. The productivity of rice, the staple food of more than one third of the world's population, declines 10% with every 1°C increase in temperature.
- **Pests and disease:** Rising temperatures favour agricultural pests, diseases and disease vectors. Pest populations are on the rise and illnesses once found only in limited, tropical areas are now becoming

endemic in much wider zones. In Southeast Asia, for example, where malaria had been reduced to a wet season only disease in most areas, it is again endemic almost everywhere year around. Likewise, dengue fever, once largely confined to tropical areas, has become endemic to the entire region.

- **Ocean acidification:** Rising temperature and rising CO<sub>2</sub> levels are making the world's oceans more acidic (lowering their pH). More acidic sea water damages the ability of sea creatures to make shells. Shelled species, tiny and large, are the base of the ocean food pyramid and their loss threatens the food producing potential of the oceans.
- **Sixth Extinction:** The previous five extinctions had occurred over the last 450 million years, due mainly to meteorites and volcanic eruptions. The sixth extinction, however, has to do with human beings. "Human activity, the consumption of fossil fuels, the acidification of the oceans, pollution, deforestation, and forced migrations threaten life forms of all kinds. It is estimated that one-third of corals, freshwater molluscs, sharks, and rays, one-fourth of all mammals, one-fifth of all reptiles, and one-sixth of all birds are heading towards extinction". This resounding paragraph taken from the book *The Sixth Extinction* (2015) by journalist and Pulitzer Prize winner Elizabeth Kolbert is a good summary of the current situation of the natural biodiversity on planet Earth.
- **Human Cost:** Climate Change is the defining issue of our time and we are at a defining moment. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly. In October 2018 the IPCC issued a special report on the impacts of global warming of 1.5°C, finding that limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society. With clear benefits to people and natural ecosystems, the report found that limiting global warming to 1.5°C compared to 2°C could go hand in hand with ensuring a more sustainable and equitable society. While previous estimates focused on estimating the damage if average temperatures were to rise by 2°C, this report shows that many of the adverse impacts of climate change will come at the 1.5°C mark.

**3 Challenges to Democracy:** If one goes by the number of countries that are officially democratic then one definitely can be complacent. That is because democracy has enjoyed a good ascent after renaissance. The trend continued. Four decades ago around a third of the world's nations held free elections. Compare that with the data a decade back, nearly two thirds of the countries are democratic. Capitalism has become with passing decades remarkably responsive to what people want as individual consumers. In contrast, democracies have struggled to perform their own basic functions: to articulate and act upon the common good, and to help societies achieve both growth and equity. The reasons are the policies adopted by the governments and even by world bank. According to an article in The Washington Post, "The World Bank bails out repressive regimes on a regular basis. There is no anti-tyrant U.N. task force, no Sustainable Development Goals against tyranny, no army of activists." The environmental crisis led Anthropogenic global warming (AGW) is a human rights issue. Similarly, "Equality can exist only amongst equals", as the saying goes in the name of the great British author George Orwell, the skewed income distribution is causing a challenge to democracy. The extent of unequal distribution has been brought out vividly by the 1) World Inequality Report 2018 and 2) Oxfam Report. Just one quote from an article in The Guardian will suffice to make a statement that the democracies world over are of the rich, for the rich and by the rich. Quote: "The growing concentration of the world's wealth has been highlighted by a report showing that the 26 richest billionaires own as many assets as the 3.8 billion people who make up the poorest half of the planet's population." Lastly, the inward looking leadership has come to power in many countries in the first two decades of 21<sup>st</sup> century. That leadership ignores the crisis caused by Global warming and skewed income distribution and is a direct challenge to democracy.

**3.1 Global warming is bound to violate the rights of future Generations:** Global warming is bound to violate the rights of future Generations, especially, the poor people in developing countries. Lancet

Countdown on health and climate change has warned that “A rapidly changing climate has dire implications for every aspect of human life, exposing Convergent evidence from diverse approaches suggests that 2°C Anthropogenic (man made) Global Warming (AGW), caused by burning one lakh crore ( $10^{12}$ ) tonnes of carbon (equivalent), will kill roughly a billion ( $10^9$ ) people over a period of one to two centuries. Therefore, one future person is killed every time roughly a thousand tonnes of carbon are burned. This “**1,000-tonne rule**” implies that every fossil fuel industry whose productivity can be expressed in millions of tonnes of burnt carbon is causing the premature deaths of thousands of future people. Consider the following example: Every year, Australia exports  $4 \times 10^8$  tonnes of coal. If that coal is 80% carbon, the country is exporting about  $3 \times 10^8$  tonnes of carbon per year. When that coal is burnt,  $3 \times 10^5$  future deaths are caused every year. Clearly, this and comparable industries must rapidly be wound down to protect the rights of future generations.

- 3.2 Measuring income inequality:** Under the heading “Criticism on GDP” and sub-heading “Standard of Living vs. Skewed income & wealth distribution” we had seen that GDP does not take in to account skewed income distribution. Pranab Bardhan, in his review of the book “Capital in the Twenty-First Century” (Cambridge, Massachusetts: Harvard University Press), 2014, while revealing a secret of wealth-income inequality comments, ‘Piketty uses a rather loose inclusive definition of capital, to include all non-human tradable assets net of debt, including land and real estate, finance, intellectual property rights in the form of commercial patents and, of course, physical capital. He observes in the data that over the long span of history the rate of return (he denotes it by  $r$ ) to capital in this broad sense has been larger than the rate of growth (he denotes it by  $g$ ), except in the period 1910-50. In the long run (“steady state”) wage incomes will rise at most at the rate  $g$  (growth of even the merit-based high incomes will be limited by this  $g$ ), whereas incomes from wealth will grow roughly at the rate  $r$  (barring the small drain of capitalist consumption). As long as  $r > g$ , income and wealth of the rich will grow faster than the typical income from work. He calls  $r > g$  the central element (“contradiction”) of capitalist dynamics that drives inequality.’

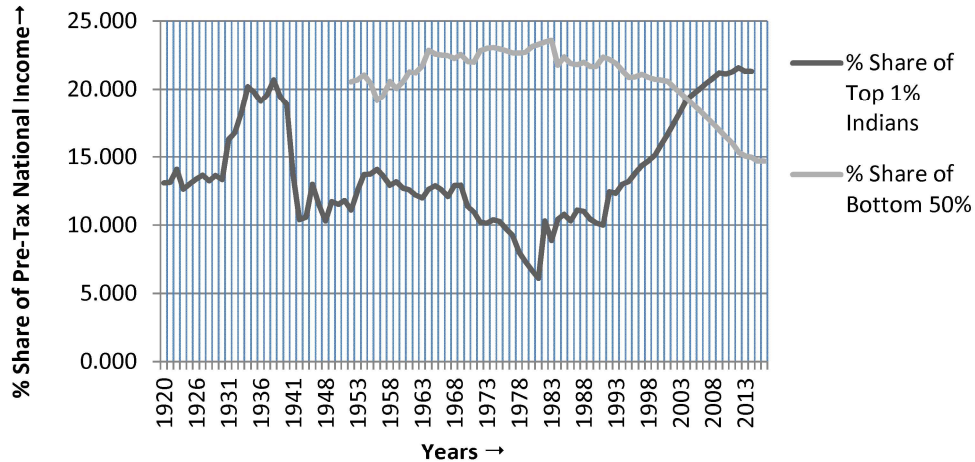
A simple measure of the income or wealth distribution is **Gini index**. The index number varies between 0 to 1 that expressed in percentage between 0% and 100%. A Gini index number “0” represents an absolute and total equality of either income or wealth as the case may be and index value of “1” (in terms of percentage 100%) refers income or wealth in the hands of one individual. In other words, higher Gini index indicates greater inequality. However, a statement, “the Gini index say of USA in the year 2016 was 0.415 or 41.5%” fails to give extent of skewed distribution. Compare that with another statement, “In the year 1985, Top 1% of Indians had as large a share as 10.452 % of the pre-tax national income. In the same way, bottom 50 % of Indians had a share of merely 21.917 % of pre-tax national income.” One will realise that the later is far richer in content. That statement prods a person to look in to the fiscal and tax policies taken by the government in the few prior years.

Further, if one looks at the Figure No. 1, it shows the trend of income distribution between ‘Top 1%’ and ‘Bottom 50%’ of Indians for over one hundred years (1922 to 2015). This trend raises many questions regarding many aspects of the past almost 100 years and the respective rulers. For example what was so special about the years around 1929-41, that the top 1% of the rich people could roughly double their share in pre-Tax national income of India? Why there is no data available for the bottom 50% of people? Was that the period of Great Depression and of war clouds gathering of the European and US sky? However, what that has to with India far away from both of these continents? Was the effect transferred British power in to Indian colony? Take second period between around 1950 and 1980.

**Figure No.-1: 1922-2015 Trends of Pre-Tax Income Distribution For India**

URL Ref.:

[https://wid.world/data/#countrytimeseries/sptinc\\_p99p100\\_z;sptinc\\_p0p50\\_z/IN/1943/1968/eu/k/p/yearly/s](https://wid.world/data/#countrytimeseries/sptinc_p99p100_z;sptinc_p0p50_z/IN/1943/1968/eu/k/p/yearly/s)



During this period, the 50% poor people started appearing in this figure. What was responsible for it? Was it independence? Were the Indian governments under Jawaharlal Nehru and later India Gandhi responsible for the decline of the share in the national income of the rich 1% population from around 13.5% in 1955 to about 6.7% in 1982? Around the same time, the share of bottom 50% poor people rose from 19% to around 23.5%. Were the policies pro-people? To what extent was the pre-tax national income growth in this period? When we come to the most recent third period from 1990 to 2005, we see that the share of rich 1% in the national income is once again rising and that of bottom 50% people is declining. Was the decision taken by the Narsimha Rao Government to open the Indian economy to the developed world responsible for this reversal? In the last decade represented in this figure, the same pro-rich trend seems to be continuing. It means such analysis of the economy is a positive step. This is expected of democratic governance. Unfortunately, this analysis has not come from Indian soil. Below the title of the figure, a reference is given for the curious readers. This welcome step invites leadership of nations to cross over their limits by taking a quantum jump.

- 3.3 Crisis of capitalism:** “Ancient *Mauryan* engineering has brought water back to the undulating and rocky terrain of *Magadh*, the grain bowl of *Bihar* that had turned almost entirely arid because of abortive modern irrigation policies.” The *Mauryan state* used technology of networking *pynes* (channels carrying water from rivers) and *ahars* (low-lying fields with embankments that act as water reservoirs) to stabilize agrarian economy. The life of needy people was thus improved. Such a foresight helped build the *Mauryan* empire. In the modern period the ancient technology was revived by Rabindra Pathak, who taught *Pali* and Sanskrit at a college in Arwal, Bihar and implemented by voluntary work of thousands of small farmers under the banner of “Magadh Jal Jamaat (MJJ)”. According to this article this work has stopped large scale migration of the rural poor people from *Magadh* region. A very similar lesson was learnt by many learned people.

Here few well-known random names with passing comments on their work are worth quoting. When nobody was in position to explain the causes of the severe worldwide economic collapse or to provide an adequate public policy solution during the period of the Great Depression of the 1930s, a British economist named John Maynard Keynes spearheaded a revolution in economic thinking. The central tenet of his thought is that state intervention can stabilize the economy, if it could impart purchasing power to the citizens on large scale through socially useful job creation. President Roosevelt struck a 'New Deal' on the lines of Keynesian line but not through State but a private company. Late Dr. V. M. Dandekar the then Director of Gokhale Institute of Politics and Economics, Pune who lead the pioneering work of poverty estimation in India first time along with his junior colleague Dr. Neelkanth Rath also learnt and taught similar lesson during the first half of 1980s decade. That Changed the pattern of the work provided under the Minimum Income Rural Employment Guarantee Scheme of Maharashtra government. That was the story of the period of severe draught in large parts of Maharashtra around 1973. On similar lines, a scheme was declared under the Mahatma Gandhi Rural Employment Guaranty Act- 2005 on national level. Another name that comes to mind is that of Vinay Bharat Ram an industrialist and an economist as well. The context is the year 2008, a year of the turmoil in the US financial markets, and its ripple effects on the world level. In that article, he makes a mention of Marx, Keynes and Friedman for having asked a question that is being asked in 2008 also, and having given an answer with amazing insight. The capitalist economy holds to the belief strongly that the market will take care of all the economic problems eventually and so the state should not interfere with market mechanism is very strong. However, all these names are recent compared to *Mauryan* empire building effort of around 2500 years back.

In the present stage of capitalism world over, the economists invite state intervention to bail out the capitalists. Such an intervention helps concentrate wealth in the hands of the companies small to corporate ones. The actual suffering people receive only frustration. Even during the Roosevelt era, World War II helped stabilize the US economy and not the "New Deal" as much. With smaller or larger intensity, the story of crisis repeats throughout the world. The trend of rising frustration is common amongst citizen that is accelerating the process of lupenization. This has clear link with the trend of present day undemocratic, war mongering and closed vision regimes in China, India, Russia, Turkey, Venezuela, USA, and many more countries.

**3.4 Alternative Indicators:** The last section discusses only two of the important alternate indicators out of the multitude of invented indicators to GDP in brief:

- **Gross National Happiness:** Upon being named king of Bhutan, **Jigme Singye Wangchuck** had declared in 1972 that his aim is not to increase GDP, but GNH — "gross national happiness." Since then the idea of GNH has influenced Bhutan's economic and social policy, and also captured the imagination of others far beyond its borders. The GNH Index includes both traditional areas of socio-economic concern such as living standards, health and education and less traditional aspects of culture and psychological wellbeing. It is a holistic reflection of the general wellbeing of the Bhutanese population rather than a subjective psychological ranking of 'happiness' alone. The first World Happiness Report (WHR) was released on April 1, 2012 by the UN. The report outlined the state of world happiness, causes of happiness and misery, and policy implications highlighted by case studies. In 2013, the second WHR was issued, and since then has been issued on an annual basis. The World Happiness Report 2018 had some grim news for India. Of the 156 countries, India ranked 133 — a steady decline from 111 in 2013. The ranking is based on a Gallup survey where respondents are asked to rate their lives on a scale of 1 to 10, with 0 being the worst possible life.
- **Human Development Index:** The major efforts by United Nations Development Program are that of Human Development Index (HDI). Pakistani economist Mahbubul Haq created HDI in 1990 which was further used to measure the country's development by the United Nations Development Program (UNDP). Calculation of the index combines four major indicators: life expectancy for health, expected years of schooling, mean of years of schooling for education and Gross National Income per capita (a derivative of GDP) for standard of living. Every year UNDP ranks countries based on

the HDI report released in their annual report. HDI is one of the best tools to keep track of the level of development of a country, as it combines all major social and economic indicators that are responsible for economic development. India climbed one spot to 130 out of 189 countries in the latest HDI ranking released today by the United Nations Development Programme (UNDP). India's HDI value for 2017 is 0.640, which put the country in the medium human development category. Between 1990 and 2017, India's HDI value increased from 0.427 to 0.640, an increase of nearly 50 percent – and an indicator of the country's remarkable achievement in lifting millions of people out of poverty.

**Sustainability of the Human Existence:** Apart from developing the complex indicators of developments, there are attempts to construct the structure of alternate economic systems. Though it is not the scope of the present paper, it prompts debates at least on some other platform. Few random examples of this type of efforts are Steady state economy, Sustainable economy, Green economy, New Climate Economy... etc. A group of economist and of other enthusiasts work for every one of the new invented systems of economy. The economic growth, rising affluence and a growing world population are the major contributors to the current environmental crisis. However, that is the economy operating in the world with of course some variations. In such an atmosphere, a talk of limiting the growth of economy amounts to a treason. Nobody from ruling fraternity wants to get out of fetish of GDP, its growth and Capitalism. Despite four decades, if not more, of political discussion about the urgency of climate change, the rising global emissions of green house gases have not reduced a bit. The environmental crisis can kill large section of poor people because they have far less resources to face the calamities compared to the economically rich strata of global population. Democracies have retained only the garb of elections, otherwise the extent of income and wealth would not have been as alarmingly skew as it is at present. The democratic system world over is losing its soul. As George Orwell has said in his famous novel, "All are equal, but some more equal." We are experiencing that. Few media barons manage to manufacture a consensus for the undemocratic leaders of the world. If GDP keeps on rising with acceleration, the environmental crisis will catch us and there will not be any democracy left to take decisions in the interest of humanity. Like the members of the Russell- Einstein manifesto, we should en masse give a call not as citizens of this nation or that, followers of this religion or that, and subscriber to this ideology or that, but in the interest of at least all present and future human beings. Degrowth of the advanced capitalist countries is an essential step in this process.

Perhaps, it is easier to imagine the end of the world than to imagine the end of capitalism. We have to revise that statement now so that we may equip ourselves to witness the end of capitalism, so that we will not be forced to witness the end of the human world.

### Conclusions

With the help of so many authors of the world writing on Limitations of the concept of GDP, Environmental crisis and Challenges to Democracy, the author of this paper draws following conclusions:

1. Considering all the limitations pointed out in this paper and elsewhere and the strong fetish surrounding the GDP, its use in the form of Per Capita Real GDP (PPP) only should be used to measure the size of economy. That also should have a footnote, "The extent to which the income and wealth distribution is unequal, will distort the averages and the aggregate values."
2. As on the environmental crisis, world governments should adhere to the Intergovernmental Panel on Climate Change (IPCC) recommended 1.5 °C temperature rise in the average Earth temperature compared to her pre-industrial revolution era average temperature (according to IPCC it is average of 1850-1900). Every citizen of the world must understand that this recommended rise in temperature is not a rise in local temperature, nor it is a limit below which (i.e. say temperature rise of 1.499999°C) one need not worry at all. That is because people of the world are already experiencing some of the disastrous Global warming effects, irrespective of whether we know them or not. Global emissions were roughly 52 billion tonnes of carbon equivalent CO<sub>2</sub> gas (denoted as 52 GtCO<sub>2</sub>e) in 2016. These green house gas emissions are projected to between 52-58 GtCO<sub>2</sub>e by 2030. Against these projections, annual emissions need to be about



half that (25-30 GtCO<sub>2</sub>e/yr on average) by 2030 to limit warming to 1.5°C. It is high time the world governments gear up to find ways and means to reduce use of fossil fuels drastically, avoid generating waste and if not avoidable, recycle the generated wastes to avoid the terrifying environmental crisis.

Democracy in true sense, and not this ism or that ism, is an essential factor for sustainability. That is why democracy that makes rich individuals richer is not a democracy we should aspire. Like equal opportunities to all irrespective of casts, religion, gender, skin colour, language, nationality etcetera, democracy should strive for equal opportunities for all to earn for one's livelihood irrespective parents wealth or income status. That is possible only when wealth and income distribution is drastically less skew. We the citizen of World should aspire for that democracy and to achieve that must keep our pressure on the existing governments.

**0124004 DATTA, DEBABRATA (Radiological Physics and Advisory Division Bhabha Atomic Research Centre, Mumbai). IMPACT OF 'BRAIN-DRAIN' ON GROWTH OF INDIGENOUS SCIENCE AND TECHNOLOGY**

What is the importance of science? Why we should culture for science? We search for answers of these queries and we felt that the science is recognized as an economic driver from the point of its importance. Developed countries are focusing on strengthening science increasingly. A developing country should produce good scientist and at the same time country should develop a scheme to retain them. Statistics prove that in the developing world birth of one renowned scientist in 8 takes place. The main evidence says that in the world, a large number of brain drain takes place from a developing country. The extreme size of this brain drain makes it a valuable context for studying brain drains. Ever since the developing countries embarked on building modern scientific and technical structures, the problems associated with the process of brain drain became a stumbling block in building local-national S & T capacities for development in many emerging fields of research. It also makes an analysis of scientific brain drains essential for understanding the scientific performance, knowledge production and diffusion of knowledge to developing countries. Scientific brain drains are also interesting because exceptionally rich, longitudinal data are available on scientists' locations, making it possible to estimate brain drains over the life-cycle. By contrast, aggregate statistics is the basis of most of the existing work on brain drains. Population determines the pool of potential scientists and may affect the incentives to innovate and small countries experience larger brain drains per capita. Training scientists in high tech and frontier fields of research without the existence of a certain viable number of research groups or specialist communities (in a sociological sense of the term), in the first instance, results in the migration to places which offer a better professional climate and which have created a demand for intellectual capacities. As one of the leading Indian chemical scientists observed, "The brains go where the brains are implying brain goes where there is a challenge and brain goes where intellectual achievements are valued". The status of scientific communities and the professionalization of science and technology fields of research is closely associated with the phenomena of brain drain and brain gain - the features being the two faces of the same "coin". Beyond the central focus of the concept of scientific communities and professionalization in understanding the problem of brain drain, the perspective of networks is also used to map the structure of biotechnology field for its research-academia-industry-market connectivity. It is seen that this network emerged in three stages over a period of two decades. As elsewhere in the world the emergence of biotechnology industry in India is seen to have created a demand for absorption of scientific and technical personnel.

### **1. Growth of Indigenous Science and Technology**

Science is the pursuit of knowledge and methodology to gather this knowledge is culturally relative. Traditional knowledge is incorporated by indigenous science. Perspective of indigenous development in the science and technology compared to non-Indigenous scientific approaches are commonly recognized as Western science. Indigenous perspectives are holistic and founded upon interconnectedness, reciprocity and the utmost respect for nature. Historical evidence provides the fact that indigenous peoples have been responsible for the development of many technologies and have substantially contributed to science.

It is always useful to notify the development of science and technology in India. India Brand Equity Foundation [2] notifies that India ranks 8<sup>th</sup> in the world in terms of number of students graduating in science and

engineering stream. Continuing the notification from the same web portal, it is envisaged that modern India has had a strong focus on science and technology realizing that it is a key element of economic growth. In the field of scientific research, India is among the topmost countries in the world and positioned as one of the top five nations in the field of space exploration. The country has regularly undertaken space missions, including missions to the moon and the famed Polar Satellite Launch Vehicle (PSLV). Some of the recent developments in the field of science and technology in India are as follows: In the field of nuclear reactor technology, India has mastered the design, implementation operation and regulation on pressurized heavy water reactor (PHWR), fuel fabrication, fuel reprocessing and radioactive waste management. In the field of nuclear technology, India has grown substantially. Let us discuss about the nuclear power program of India.

### **2.1 Development of Technology associated with Nuclear Power Program of India**

The Indian nuclear programme is based on unique sequential three-stages. Associated technologies essentially were to aim at optimum utilization of the indigenous nuclear resource profile of modest Uranium and abundant Thorium resources [3]. The spectrum of the significant activities associated with atomic energy program of India contains R &D in Nuclear Sciences and Engineering, Exploration & Mining of Radioisotopes, Nuclear energy development and implementation, application of Nuclear Energy, Bio-Agricultural Research and Medical Sciences etc. The commercial nuclear power program of the first stage (comprising of PHWRs and imported LWRs) is implemented by Nuclear Power Corporation of India Limited (NPCIL), and the second stage (comprising of Fast Breeder Reactors) by Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI), both companies owned fully by the union government in accordance with the provisions of the act [3]. The sequential three-stage nuclear program is based on a closed fuel cycle, where the spent fuel of one stage is reprocessed to produce fuel for the next stage. The closed fuel cycle thus multiplies manifold the energy potential of the fuel and greatly reduces the quantity of waste generated. The first stage comprises of Pressurized Heavy Water Reactors fuelled by natural uranium. Natural uranium contains only 0.7% of Uranium-235, which undergoes fission to release energy (200MeV/atom). The remaining 99.3% comprises Uranium-238 which is not fissile however it is converted in the nuclear reactor, to fissile element Pu-239. In the fission process, among other fission products, a small quantity of Plutonium-239 is formed by transmutation of Uranium-238.

The second stage, comprising of Fast Breeder Reactors (FBRs) are fuelled by mixed oxide of Uranium-238 and Plutonium-239, recovered by reprocessing of the first stage spent fuel. In FBRs, Plutonium-239 undergoes fission producing energy, and producing Plutonium-239 by transmutation of Uranium-238. Thus the FBRs produce energy and fuel, hence termed Breeders. FBRs produce more fuel than they consume. Over a period of time, Plutonium inventory can be built up by feeding Uranium-238. Thorium-232, which constitutes world's third largest reserves in India, is not fissile therefore needs to be converted to a fissile material, Uranium-233, by transmutation in a fast breeder reactor. This is to be achieved through second stage of the program, consisting of commercial operation of Fast Breeder Reactors (FBRs).

In the second stage, once sufficient inventory of Plutonium-239 is built up, Thorium-232 will be introduced as a blanket material to be converted to Uranium-233.

Considering the sequential nature of the indigenous nuclear power program, and the lead time involved at each stage, it is expected that appreciable time will be taken for direct thorium utilization. Therefore, innovative design of reactors for direct use of thorium is also in progress in parallel to three stage program. In this context, the frontier technologies being developed include the Accelerator Driven Systems (ADS) and Advanced Heavy Water Reactor (AHWR) [3]. The ADS essentially is a subcritical system using high-energy particles for fission. One of the significant advantages of this system is small quantity of waste production. The quantity of waste in this system is greatly reduced in comparison to the existing reactors as Actinides produced in ADS are 'burnt' out [3].

The AHWR is another innovative concept, which will act as a bridge between the first and third stage essentially to advance thorium utilization without undergoing second stage of the three stage program. It uses light water as coolant and heavy water as moderator. It is fuelled by a mixture of Plutonium-239 and Thorium-232, with a sizeable amount of power coming from Thorium-232 [3].

In India, nuclear energy development began with the objectives of peaceful uses of atomic energy in improving the quality of life of the people and to achieve self-reliance in meeting the energy needs. The commercial Nuclear Power program, started in 1969 with the operation of TAPS 1&2 (BWR), currently shares about 3% country's installed capacity. Thus playing a complementary role in meeting the country's energy demand. However, in long term, it is expected to play a significant role in meeting the huge electricity demand of the country [3].

For faster nuclear power capacity addition, in parallel to the indigenous three stage program, additional components based on imports have been introduced. Two Light Water Reactors (LWRs) of 1000 MWe each are under construction at Kudankulam in technical cooperation with the Russian Federation [3]. As capacity addition through the indigenous route is guided by the fuel cycle linkages of the sequential three stage program, faster capacity addition in the near term to meet the electricity needs of the country will be possible through these additionalities. Current status in this direction can be framed in the following way.

The first stage consisting of pressurized Heavy Water Reactors (PHWR) has reached a state of commercial maturity and the second stage of Fast Breeder Reactors (FBRs) has been commercially launched with the construction of 500Mwe Fast Breeder Reactor (FBR) at Kalpakkam. The third stage systems (using U233 – Thorium-232 obtained from spent fuel of second stage) have been developed at pilot scale. The development of commercial technology of third stage is under way currently. However, the commercial deployment of this technology is expected to take appreciable time.

As of March 2018, **India** has 22 **nuclear** reactors in operation in 7 **nuclear power plants**, having a total installed capacity of 6,780 MW. **Nuclear power** produced a total of 35 TWh and supplied 3.22% of **Indian electricity** in 2017. ... As of 2017, the lifetime weighted **energy** availability factor of the **Indian** fleet is 63.5% [3].

### 2.1.1 Development of Nuclear Power Technology [3]

The first stage program went through stages of technology demonstration, indigenization, standardization, consolidation and finally commercialization. While the first stage began with 220 MWe reactors supplied by AECL, Canada, the subsequent PHWRs have all been indigenous. The Canadian assistance was withdrawn in 1974, even as the second unit of Rajasthan was under construction. It brought an international technology denial regime and isolation of the country from the rest of the world. Under such difficult and challenging circumstances, the Indian scientists and engineers rose to the occasion and with their untiring and innovative efforts, not only RAPS –1 but the design, construction and commissioning of the other unit too (RAPS-2) could be successfully completed. Subsequently, MAPS units 1&2 were designed, constructed and commissioned with indigenous efforts. The design of 220 MWe PHWRs was standardized, and NAPS 1&2 & KAPS 1&2 set up. Kaiga 1&2 and RAPS 3&4 were also set up with further improvements in design. The standard 220Mwe design was scaled up to 540 MWe and TAPP 3&4 (2x540Mwe) have been set up. The 700 MWe PHWR design, using the same core of 540MWe, has been developed and construction of eight such reactors is planned to be taken up in the XI Plan (200712).

The country has developed comprehensive capabilities in all aspects of nuclear power from siting, design, construction, operation of nuclear power plants. Comprehensive multidimensional R&D facilities have been set up. Capabilities have also been developed in front and back ends of the fuel cycle, from mining, fuel fabrication, storage of spent fuel, reprocessing and waste management. Infrastructure for other inputs heavy water, zirconium components, control and instrumentation etc. has been established. Excellent Human Resource and training infrastructure has been developed for the specialized skills needed for nuclear power. At present 17 reactors with a capacity of 4120 MWe are in operation and six with a capacity of 3160 MWe are under construction. Nuclear Power plants have registered high availability factor, safety performance and longest continuous operation comparable to international standards. The Indian nuclear power plants have also performed at par with international benchmarks. Figure below depicts the performance of NPCIL units vis-à-vis others worldwide: The performance of Indian nuclear power reactors in terms of safety has been excellent, with 282 reactor years of safe, accident free operation. The health assessment of Tarapur Unit #1&2 has been carried out using the latest and advanced techniques. Based on these studies, the plant life has been extended by replacing the important equipment/components. This includes replacement of Secondary Steam Generators (SSGs). In addition to this, safety upgradation of the units have also

been completed successfully. The Tarapur units after renovation and modernization are operating with availability Factors near 100%.

### **2.1.2 Developments in Renovation and Modernization [3]**

NPCIL has developed and carried out unique R&M activities in its stations, namely Enmasse Coolant Channel Replacement (EMCCR) which has been successfully carried out at four reactors (Rajasthan Atomic Power Station –2, Madras Atomic Power Station 1&2 & Narora Atomic Power Station -1) with indigenous technology [3]. En masse Feeder Replacement (EMFR) was carried out for the first time in the world in a PHWR at MAPS-1. It has been carried out subsequently at Narora Atomic Power Station-1 & is presently underway at RAPS-2 [3].

## **2. Development of Computer Technology in India [4]**

In the field of computer technology, a substantial growth has taken place. Computers in the form of personal desktop computers, laptops and tablets have become such an important part of everyday living that it can be difficult to remember a time when they did not exist. In reality, computers as they are known and used today are still relatively new. Although computers have technically been in use since the abacus approximately 5000 years ago, it is modern computers that have had the greatest and most profound effect on society. The first full-sized digital computer in history was developed in 1944. Called the Mark I, this computer was used only for calculations and weighed five tons. Despite its size and limited ability it was the first of many that would start off generations of computer development and growth. Technological evolution and generation wise development of computers are depicted in sections 3.1. – 3.5.

### **3.1 First Generation Computers**

First generation computers bore little resemblance to computers of today, either in appearance or performance. The first generation of computers took place from 1940 to 1956 and was extremely large in size. The inner workings of the computers at that time were unsophisticated. These early machines required magnetic drums for memory and vacuum tubes that worked as switches and amplifiers. It was the vacuum tubes that were mainly responsible for the large size of the machines and the massive amounts of heat that they released. These computers produced so much heat that they regularly overheated despite large cooling units. First generation computers also used a very basic programming language that is referred to as machine language.

### **3.2 Second Generation Computers**

The second generation (from 1956 to 1963) of computers managed to do away with vacuum tubes in lieu of transistors. This allowed them to use less electricity and generate less heat. Second generation computers were also significantly faster than their predecessors. Another significant change was in the size of the computers, which were smaller. Transistor computers also developed core memory which they used alongside magnetic storage.

### **3.3 Third Generation Computers**

From 1964 to 1971 computers went through a significant change in terms of speed, courtesy of integrated circuits. Integrated circuits, or semiconductor chips, were large numbers of miniature transistors packed on silicon chips. This not only increased the speed of computers but also made them smaller, more powerful, and less expensive. In addition, instead of the punch cards and the printouts of previous systems, keyboards and monitors were now allowing people to interact with computing machines.

### **3.4 Fourth Generation Computers [5]**

The changes with the greatest impact occurred in the years from 1971 to 2010. During this time technology developed to a point where manufacturers could place millions of transistors on a single circuit chip. This was called monolithic integrated circuit technology. It also heralded the invention of the Intel 4004 chip which was the first

microprocessor to become commercially available in 1971. This invention led to the dawn of the personal computer industry. By the mid-70s, personal computers such as the Altair 8800 became available to the public in the form of kits and required assembly. By the late 70s and early 80s assembled personal computers for home use, such as the Commodore Pet, Apple II and the first IBM computer, were making their way onto the market. Personal computers and their ability to create networks eventually would lead to the Internet in the early 1990s. The fourth generation of computers also saw the creation of even smaller computers including laptops and hand-held devices. Graphical user interface, or GUI, was also invented during this time. Computer memory and storage also went through major improvements, with an increase in storage capacity and speed.

### 3.5 The Fifth Generation of Computers [5]

In the future, computer users can expect even faster and more advanced computer technology. Computers continue to develop into advanced forms of technology. Fifth generation computing has yet to be truly defined, as there are numerous paths that technology is taking toward the future of computer development. For instance, research is ongoing in the fields of nanotechnology, artificial intelligence, as well as quantum computation.

### 2.6 Development in Information Technology in India

India's IT Services industry was born in Mumbai in 1967 with the establishment of the Tata Group in partnership with Burroughs [6]. The first software export zone, SEEPZ – the precursor to the modern-day IT park – was established in Mumbai in 1973. More than 80 percent of the country's software exports were from SEEPZ in the 1980s.

The Indian economy underwent major economic reforms in 1991, leading to a new era of globalization and international economic integration, and annual economic growth of over 6% from 1993–2002. The new administration under Sri Atal Bihari Vajpayee (Posthumus) (who was Prime Minister from 1998–2004) placed the development of Information Technology among its top five priorities and formed the Indian National Task Force on Information Technology and Software Development. Wolcott & Goodman (2003) report on the role of the Indian National Task Force on Information Technology and Software Development: Regulated VSAT links became visible in 1994. Desai (2006) describes the steps taken to relax regulations on linking in 1991. In 1991 the Department of Electronics broke this impasse, creating a corporation called Software Technology Parks of India (STPI) that, being owned by the government, could provide VSAT communications without breaching its monopoly. STPI set up software technology parks in different cities, each of which provided satellite links to be used by firms; the local link was a wireless radio link. In 1993 the government began to allow individual companies their own dedicated links, which allowed work done in India to be transmitted abroad directly. Indian firms soon convinced their American customers that a satellite link was as reliable as a team of programmers working in the clients' office.

#### 3.6.1 Leadership in Artificial Intelligence in India [7]

Artificial Intelligence (AI) refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making. Initially AI based technology is conceived as a technology that could mimic human intelligence. AI has evolved in ways that far exceed its original conception. With incredible advance made in data collection, processing and computation power, intelligent systems can now be deployed to take over a variety of tasks, enable connectivity and enhance productivity. As AI's capabilities have dramatically expanded, so have its utility in a growing number of fields. The truly transformative nature of the technology, yet the nascent stage of its adoption worldwide, provides India with an opportunity to define its own brand of AI leadership. The strategy should strive to leverage AI for economic growth, social development and inclusive growth, and finally as “Garbage” for emerging and developing economies. While AI has the potential to provide large incremental value to a wide range of sectors, adoption till date has been driven primarily from a commercial perspective. One can apply AI in solving societal needs [7]:

- (a) Healthcare: increased access and affordability of quality healthcare.
- (b) Agriculture: enhanced farmers' income, increased farm productivity and reduction of wastage.

- (c) Education: improved access and quality of education
- (d) Smart cities and infrastructure: efficient and connectivity for the burgeoning urban population, and
- (e) Smart mobility and Transportation: smarter and safer modes of transportation and better traffic congestion problems.

### 3. Definition: Brain Drain

The Oxford Advanced Learner's dictionary defines Brain Drain as: "**Movement of highly skilled and qualified people to a country where they can work in better conditions and earn more money**" [8].

In a simple concept, brain drain occurs due to movement of educated, professional workers from one working place to comparatively better working place (generally skilled person goes to abroad). It may also occur from the public to the private sector and also from the private sector to the public sector.

Brain drain may also occur if they leave a place or company to seek a benefit from better pay, working conditions, lifestyle and sometimes work-life balance. In other words, we can say that brain drain occurrence takes place on a sliding scale and may affect one company or an entire country.

Additionally, brain drain has also been defined as the loss of human capital, since it involves people with myriad specialized skills leaving their home country.

Industries may also experience brain drain if employees of the industry perceive the industry as backward, lack of innovation or repressive with regard to rules and regulations. Development of a country is always possible if we have a continuous growth of scientific, technological and industrial development. However, looking towards the development of science and technology, skilled people movement takes place. So, it is mandatory to highlight the growth of Indigenous Science and Technology in India. Section 3 presents an overview of this aspect.

### 4. Brain drain from India: A reason

The phenomenon of brain drain from India is nothing new. It can be traced to the British colonial era. Indian craftsmen were relocated in England and other British colonies where their skills could be used in various industries. In recent times, brain drain from India has several factors: such as a) *Very high salaries paid in foreign countries*, b) *Lack of adequate employment opportunities in India*, c) *Non availability of avenues to utilize education and skills*, d) *Hope of a better and comfortable lifestyle abroad*, e) *Prestige involved in working in foreign countries*, f) *To acquire financial well-being and capability to buy assets in India*, g) *Belief that working abroad improves marriage prospects in India*, h) *Prospects of continually learning newer technologies and upgrading skills* [9]. As an example, we can quote the little country Goa. The tiny Indian state, Goa, with an estimated population of 1.5 million, accounts for some of the highest brain drain from India. In 2016, an average of 11 residents of Goa per day, gave up their Indian nationality to become citizens of Portugal. Residents of Daman and Diu also traded their Indian citizenship in favor of Portugal. Goa, Daman and Diu were colonies of Portugal till December 19, 1961, till they were overrun by the Indian Armed Forces. These territories became part of the Indian republic [9].

### 5.1 Location of Brain Drain [10]

Some of the topmost countries where Indian brain migrates are: (i) USA, (ii) Saudi Arabia, (iii) United Arab Emirates, (iv) Canada, (v) Australia, (vi) Newzeland, (vii) European Union. As can be seen, the US remains topmost destination for Indians. Thousands of Indian citizens travel to the US for higher studies. However, upon completion, they prefer to stay and work in the US. Engineers and experts in all fields work in the US. However, in recent years, Information Technology and software experts from India form bulk of migrants to the US (Fig. 1)..

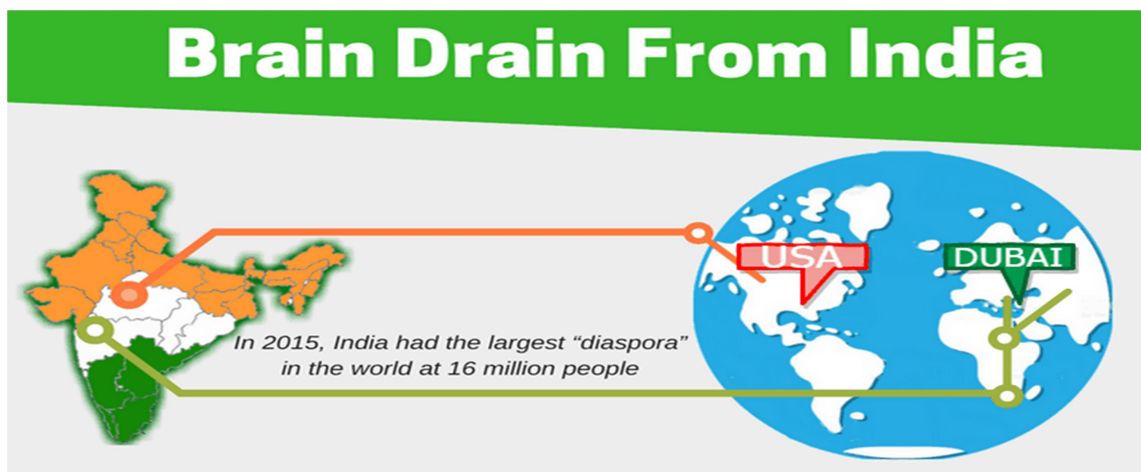


Fig. 1

### 5. Brain Drain in the field of Biotechnology [10]

Biotechnology is generally defined as the “application of science and engineering principles to the processing of materials by biological agents to provide goods and services”. What is also recognized is the feature that the fostering of biotechnology is closely related to various basic science specialities such as molecular biology, biochemistry, microbiology, chemical engineering, genetics etc. In other words, without a strong professional base in these basic science areas, the application and commercialization of biotechnological processes are difficult to emerge and sustain. This feature is reflected from the Indian experience. Though the Indian basic research base in the conventional biological sciences can be traced to the turn of the present century, creation of basic research base with recognizable research groups in the disciplines of modern biology (excluding biotechnology) took place during the late 1960s and 1970s. It is only after the growth of modern biology specialities during this period, the specialist community created a demand for fostering the field of biotechnology which is intimately connected to molecular biology.

The spin off from the professional growth of biotechnology and closely related fields of research has been the expansion of biotechnology industry in the country. Recognizing the growing status of the biotech industry in the areas of chemicals, drugs, agriculture, medical and health, diagnostics etc., the DBT in collaboration with financial institutions like Industrial Development Bank of India and the private sector companies set up an organization called the Biotech Consortium India Ltd (BCIL) in 1990. The major objective of this organization is to facilitate the transfer of biotechnology processes into the industry and aid its commercialization. There are over 175 biotechnology industries in India, of which 160 are in the private sector and 15 in the public sector. The future expansion of biotechnology industry is likely to create a further demand for the absorption of trained scientific and technical personnel in India. With the expansion of the biotechnology industry and the professional competence in the field, some multinational corporations have entered into the Indian market by setting up research and development units and as well as began commercial operations from India. In this growth of biotechnology industry, the role of basic research groups in the national laboratories has been remarkable in the recent years.

### 6. India tops in brain drain of scientists, engineers to the US

A report released by the US-based National Science Foundation states: “*Indian-origin scientists and engineers in the U.S. grew 85percent between 2003 and 2013, says a report by the National Science Foundation, a key funder of research in the United States as well as a monitor of demographic change among scientists and technologists.*” Nearly a million scientists and engineers of Indian origin reside in the US alone, it adds. Among Asian countries, India continues its trend of being the top country of birth for immigrant scientists and engineers to

the US, says a latest report, adding that with 950,000 out of Asia's total 2.96 million, India's 2013 figure represented an 85 percent increase from 2003. These figures are clear indicators that India is facing a massive brain drain [10].

Overall, the number of immigrant scientists and engineers in the US has risen to 18 per cent from an earlier 16 per cent and 57 per cent of those were born in Asia. From 2003 to 2013, the number of scientists and engineers residing in the US rose from 21.6 million to 29 million. This 10-year increase included significant growth in the number of immigrant scientists and engineers, from 3.4 million to 5.2 million, said the report from the National Science Foundation's National Centre for Science and Engineering Statistics (NCSES). In 2013, 63 per cent of US immigrant scientists and engineers were naturalized citizens, while 22 per cent were permanent residents and 15 per cent were temporary visa holders. Over 80 per cent of immigrant scientists and engineers were employed in 2013, the same percentage as their US-born counterparts. Among the immigrants in the science and engineering workforce, the largest share (18 per cent) worked in computer and mathematical sciences, while the second-largest share (eight per cent) worked in engineering. Three occupations -- life scientist, computer and mathematics scientist and social and related scientist -- saw substantial immigrant employment growth from 2003 to 2013, the report said.

Present technology in the same field often talks of a predictive model, which explores the real world. The reason behind this transformation is due to a fact that computation is often described as digital disruption. But an aspect of this transformation that can easily be overlooked is that computing has been disrupting itself. The current trends of technology towards the development of computer science and engineering are on Artificial Intelligence (AI), Machine Learning (ML), Robotics (application of drones) and data science. The following section presents the India's approach to leadership in AI

It is a fact that computing in various branches of science, economics and technology continues to change our world. It shapes how objects are designed, what information we receive, how and where we work, and whom we meet and do business with. In short, computing changes our understanding of the world around us and the universe beyond. In this some examples can be evidenced.

Computers were initially used in weather forecasting in an efficient way to assemble observations and do calculations. But today our understanding of weather is almost entirely mediated by computational models. In biology, once research was done entirely in the lab (or in the wild) and captured in a model.

## 7. Brain drain patterns from India [11]

### *USA*

As can be seen, the US remains topmost destination for Indians. Thousands of Indian citizens travel to the US for higher studies. However, upon completion, they prefer to stay and work in the US. Engineers and experts in all fields work in the US. However, in recent years, Information Technology and software experts from India form bulk of migrants to the US.

### *Arabian Gulf*

India's brain drain to member states of the Gulf Cooperation Council (GCC) is usually in the form of highly qualified engineers in petroleum, petrochemical and natural gas sectors. Other sectors include telecom and banking. Skilled nurses and physicians from India are also in great demand in the six GCC states that include the Kingdom of Bahrain, State of Kuwait, Sultanate of Oman, Kingdom of Saudi Arabia, State of Qatar and United Arab Emirates.

Generally, highly qualified professionals from India working in GCC states apply for immigrant visas to Canada, Australia and New Zealand, after gaining experience in their chosen fields.

Technologies used in these oil rich countries are comparable with those in the US and Europe. Hence, thousands of Indian migrants utilize their stay in Arabian Gulf states to acquire skills required for migrating.



### ***Australia and New Zealand***

Over the last decade, Australia and New Zealand have become one of the favorite destinations for Indians to pursue higher studies. Furthermore, Australia and New Zealand also have fairly liberal immigration policies. Consequently, thousands of Indian students settle and work in Australia after completing their studies. Additionally, Australia as well as New Zealand welcomes skilled migrants from various parts of the world. Therefore, hundreds of Indians migrate to Australia and New Zealand annually and acquire citizenship of these countries.

### ***Canada***

Canada is yet another country favored by Indian immigrants. The country also welcomes highly skilled Indian citizens. With fairly liberal immigration policies, Canada attracts thousands of Indian migrants, adding to India's brain drain.

### ***European Union***

Europe is currently facing population imbalance. Meaning, most citizens of various European Union states are above the age of 35 years. These countries have a large population of people aged above 50 years. There is a shortage of younger people required for specific jobs. Consequently, Indian nurses, physicians, care givers as well as IT and software experts are welcomed by various EU member states. However visa policies of various European states continue to remain stringent. Therefore, Indian brain drain to EU is somewhat limited.

### **The bright sides**

Brain drain from India however has a few bright sides too. According to a recent report released by the World Bank, India is expected to receive whopping US\$65 billion in remittances from the Indian diaspora abroad by December 2017. This makes India the largest receiver for foreign remittances and adds to the country's foreign exchange reserves. Secondly, several Indians living abroad are opening businesses here in India. The Indian government is offering incentives for Non Resident Indians and Overseas Citizens of India to open businesses in various sectors in the country. The government promises easier and faster licensing to such entrepreneurs.

### **The current scenario**

#### ***USA***

*If you are planning to study in the US or migrate there for work, here is a word of caution. Following his victory, President Donald Trump of the US is moving towards tightening the H1B visa for all nationalities. Indians are the largest beneficiaries of the H1B visa, which allows working in the US and eventual naturalization as an American citizen. Stringent rules proposed by President Trump means, fewer Indians will be able to migrate to the US.*

#### ***Arabian Gulf***

All six GCC states are now empowering their citizens for higher studies in the US and UK. Consequently, all top and mid-level positions in the government and private sectors of these countries are by law reserved for highly qualified citizens of these countries.

GCC states are also imposing curbs on import of manpower- skilled, semi-skilled and unskilled- from India.

### *Australia and New Zealand*

In recent years, Australia and New Zealand have raised the bar for skilled Indian migrants. Meaning, unless you hold exceptional skills and qualifications, you will not be issued a migrant visa.

### *European Union*

As explained earlier, work visa and residence rules for member states of the European Union continue to remain strict. Some countries issue work visa for limited, one or two year duration only. They also adopt very strict procedures for granting migrant status or citizenship.

## 8. Whether India gets benefit?

Admittedly, brain drain from India cannot be curbed fully. However, with modern technologies arriving in India, incentives offered to start own enterprises and start-up companies, highly skilled Indian professionals may find it lucrative to work here rather than migrate. Here are some indicators that brain drain from India may ebb over the coming years:

- *Indian companies now pay salaries comparable with their foreign counterparts.*
- *Stricter visa regulations by the US, EU and other countries means, skilled Indians will find it difficult to migrate.*
- *The Make In India initiative has seen scores of foreign companies open business in India. Their pay scales meet international standards. Hence, Indian brains can find well paid jobs without leaving the country.*
- *Investor friendly policies adopted by the government will most likely see skilled Indians launching their own start-up ventures that can compete with their foreign rivals.*
- *Policies of America First adopted by President Donald Trump of the US is likely to cause thousands of highly qualified and skilled Indians to return home and launch their own ventures.*

## 9. Reasons of Brain Drain from India [11]

Brain Drain is the emigration of highly trained or intelligent people from a particular country. In last decade, brain drain is happening at an alarming rate, and the stats will open your eyes more clearly. Among the Asian countries, India continued its trend of being the top country of birth for immigrant scientists and engineers, with 9,50,000 out of Asia's total 2.96 million. India's 2013 figure represented an 85% increase from 2003. India is a developing country so why our young engineers, entrepreneurs and scientists are flying off to foreign countries. *Why are they not working here? Why are they not living here? Why do they think foreign is better than India?*

### 10.1 There exist five reasons for India's Brain Drain [11]

#### (a) Unemployment in India

Unemployment in India is a serious social issue. Millions of engineers are graduated every year in India and among that only 4% gets a good job and rest 60% remain unemployed. **The number of unemployed persons in India decreased to 39963 thousand in 2009 from 39974 thousand in 2007. Unemployed persons in India and Kenya averaged 36933 thousand from 1985 until 2009, reaching an all-time high of 41750 thousand in 2001 and a record low of 24861 thousand in 1985 (Wiki). This is the main reason for brain drain in our nation.** Corruption and Government are destroying most of the finest talents of our country.

#### (b) Policies in India

If you are an entrepreneur, then it's challenging to work here as the economic condition of our nation is very bad. Obviously, you want to earn a lot of money, but in India, taxes like wealth tax and inheritance tax change

the game. In India, for every profit of Rs 100 you made, you are supposed to give away 98 INR to government and keep only Rs 2 for yourself (via). Why would entrepreneurs of our nation work in such a ridiculous condition? **Our talented entrepreneur does not want to leave our nation, but policies drag them out.**

**(c) No Value of Talent**

Sundar Pichai is the CEO of Google; Satya Nadella is the chief executive officer of Microsoft, and Indra Nooyi is the chief executive officer of PepsiCo. All the CEO here has one similarity they all are Indians, and now one question arises that if they can become CEO in the USA so why can't they become CEO in India. Because in India, there is no value of talent; rich will become richer and poor will become poorer and it's damn true. In India, you can get any Job with just a recommendation from a higher officer that's it. You don't get a job by clearing exam and interview because this is India. Therefore, there is no surprise why our **people are more successful in foreign because they value talent, not money.**

**(d) Population**

The population of our country is 1.2 billion and granting job to the whole of the youth of this nation is next to impossible. Millions of engineer are graduating every year in India, so it's nearly unbearable to give a job to every engineer graduating. Jobs are not matching the growing population, and thousands of engineer remain unemployed, and they have no option to fly to foreign as they welcome them with joy.

**(e) Better Lifestyle and Currency Difference**

The lifestyle of foreign is better than the lifestyle of India. In foreign countries, you have new advancement and new technology, and moreover, there is no corruption and rape percentage is few as compared to India. The technology that India is introducing today has already been in action in other parts of the world. Currency difference between Us Dollar and Indian Rupee is very high (1 INR = 0.015 US Dollar). So, if you work even as a Cashier or on petrol pump in USA or Canada, still you going to earn more than an average engineer in India. Doing these type of work and getting more money than the average engineer of India what else you want.

## **10.2 Types of Brain drain Primary**

### **External brain drain**

It occurs when human resources leave their country (such as India) to go and work overseas in developed countries such as Europe, North America and Australia.

### **Secondary external brain drain**

It occurs when human resources leave their country (such as India) to go and work elsewhere in the nearer region e.g. Sri Lanka, Malaysia and Singapore.

### **Internal brain drain**

It occurs when human resources are not employed in the fields of their expertise in their own country or when human resources move from the public sector to the private sector or within a sector. Many of our own IIT engineers take up banking jobs with alacrity. Money ultimately beckons and our companies ask for a management degree everywhere.

### **Push and Pull factors**

The lack of opportunities, political instability, economic depression, Poor infrastructure, Corruption, health risks in India and rich opportunities, political stability, academic freedom, best research facilities and freedom,

developed economy, better living conditions in host countries are the main push and pull factors. The individual reasons like family influence, peer pressure and personal preference: preference for exploring, ambition for an improved career can also be considered: Higher education, employment and lack of opportunities.

### **Socio – Economic Aspects of Brain Drain in India**

India– the brain reservoir in the new knowledge based economy

The growth in knowledge intensive activities in the developed world has led to a growing demand for Science and Engineering professionals. With an important reserve of trained people in this domain, India is becoming a major supplier of human capital for the advanced economies. India is sending large number of these specialists compared to the other important origin countries.

#### **Indian students: an important source of labour for developed economies**

An important place in the flows of well-trained Indian migrants is taken by Indian students.

Increase in the immigration of Indian migrants to the European Union (EU) due to favourable Policies

The European Union has been seeking to put in place measures which comprise effective integration policies addressing education and labour market issues.

India a supplier of young and well trained-people:

The tremendous demand for psychiatrists abroad and the obstacles for setting up a practice in the in the country are two of the primary reasons for the specific type of brain drain. The gap between supply and demand was being met by “faith healers” who do not treat the patients scientifically.

#### **Implications of Brain Drain**

The under-developed countries are spending millions of rupees on the training of these experts. But the advanced countries are utilizing their service without spending any money on their training.

The emigration of health professionals has negative effects on India, especially in rural areas where the density of doctors is lower than in urban areas.

Most of the students who go abroad for higher studies do not return to India. After seeing, the affluent life of foreign countries they lose all interest in their own country.

There is another attraction of leading a higher standard of living in foreign countries, because the technical experts and intellectuals are given special facilities there.

The government must take speedy steps to attract back home these talented sons of India who are living abroad.

These experts can surely help in making India a great power in the world.

#### **Schemes by the Indian government**

**The Ramanujan Fellowship:** Innovation in Science Pursuit for Inspired Research (INSPIRE) Programme: To encourage scientists and engineers of Indian origin from all over the world to take up scientific research positions in India, especially those scientists who want to return to India from abroad.

**The Ramalingaswamy Fellowship:** For providing a platform to scientists who are willing to return and work in India.

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**0105005 KAR, SANTOSH K (Former Professor of School of Biotechnology, Jawaharlal Nehru University, New Delhi-110067). DOING SCIENCE OF NATURE IN INDIA TODAY**

No one will deny that Science has changed the world that we live in today. The developments that has taken place in the field of Space exploration, Communication, Material Science, Health care and diagnosis as well as Agriculture to mention only a few are phenomenal. All the discoveries which are impacting our life now became possible only because some curious and dedicated individuals worked passionately in understanding natural phenomena so that at appropriate time it can be used for societal benefit.

About one hundred years ago no one knew what was the genetic material of all living beings and how one cell under normal condition divides to give rise to two identical cells. Working on to decipher it when Frederic Griffith in 1928 showed it to be DNA it was an outstanding observation. But no one believed him. Every body felt that proteins with twenty different amino acids as the building block has all the attributes to store genetic information and therefore DNA with four nucleotides as the building block could not be the genetic material. With great patience doing the same experiment in a more precise manner when Oswald Avery in 1944 reached the same conclusion people were sceptic till the DNA structure was elucidated few years later by Francis Crick and James Watson explaining how DNA can replicate. It not only established the earlier observation of Oswald Avery that DNA is the genetic material but it revolutionized biology. The work done by Griffith in 1928 and Oswald Avery in 1944 became acceptable to other scientists. These Scientists worked passionately to understand a natural phenomena which widened our knowledge base. When Fred Sanger sequenced the first protein hormone Insulin the structure of Insulin was not known. He started the sequence work using pure molecules of Insulin which was available commercially. He also believed that DNA can not be sequenced as when isolated from cells it is mostly a heterogenous mixture of many DNA molecules. For sequencing Insulin, the first protein to be sequenced, Fred Sanger got the Nobel Prize in Chemistry in 1958. Years later when it became possible to clone DNA molecule and obtain pure homogenous molecules he developed the method for sequencing DNA for which he got the second Nobel Prize in Chemistry in the year 1980. When Fred Sanger was interviewed after getting the second Nobel Prize he humbly accepted that he never thought about the Nobel Prizes but did the experiments as he enjoyed doing them. When Max Perutz and John Kendrew were working in Cambridge on the crystals of Hemoglobin and Myoglobin they never imagined how their work will open up the field of protein crystal structure. Chemists first thought that crystals of proteins did not exist in nature and are artefacts but it became acceptable when the crystal structure of hemoglobin could explain certain abnormal properties of the molecule. When GN Ramachandran and Gopinath Kartha were elucidating the structure of Collagen in their laboratory in Madras they were not confident that they will be successful but the final coiled coil structure of collagen explained many unusual properties of collagen as it existed in nature. Like children going on a treasure hunt Scientists go ahead in doing what they enjoyed doing most and when the results come it enriches our knowledge base and brings laurels to them.

Paul Ehrlich, the father of Immunology and a German Physician who got Nobel Prize in Physiology or Medicine in the year 1908 had said that scientists need four things to be successful in their efforts. That is skill (Geschick), patience (Geduld), money (Geld) and luck (Gluck). Most successful scientists would probably attribute their success to patience and persistent hard work but there were many other factors which made them successful. Only one Indian scientist CV Raman working in India has got a Nobel Prize in Physics in the year 1930. Why no one after that has got it again. For this we must try to find the answer. For that we may have to go back almost one hundred fifty years into the way research institutions developed in India.

In the year 1876 a remarkable beginning was made in Calcutta, the capital of British India, with the establishment of the first Research Institute of India, Indian Association for cultivation of Science, a private enterprise by Dr. Mahendralal Sircar an acclaimed medical practitioner of Bengal to conduct research on basic sciences like Physics, Chemistry and Biology. It was started in a private building at 210, Bowbazar Street and Dr. Mahendralal Sircar became the founder secretary to the Association, with the first Trustee Board comprising of persons like Pandit Ishwarchandra Vidyasagar and Keshab Chandra Sen. During the early years, the IACS received handsome patronage from other eminent personalities of that time like Sri Gurudas Banerjee, Raja Rajendralal Mitra, Sir Surendranath Banerjee and Raja Peary Mohan Mukherjee. The original mandate of delivering lectures in science was materialized soon when Father Lafont, Sir Jagadish Chandra Bose, Sir Asutosh Mookerjee and Rai Bahadur Chunilal Bose began teaching in the Association.

With a modest beginning, but an ambitious foresight, the Association catapulted itself into a centre of repute, which found Mahendralal's creation firmly embedded into the history of science in India. Streams of luminaries who were associated with the institute in the early years were stalwarts like Sir Nilratan Sircar, Sir Jnan Chandra Ghosh, Dr. Syamaprasad Mookerjee, Professor Satyandranath Bose and Professor M.N. Saha. The best time for the Institution came when the Nobel Prize for Physics for the year 1930 was awarded to CV Raman for the work done there.

Chandrasekhara Venkata Raman was born on November 7, 1888, in Tiruchirapalli, Tamil Nadu and obtained his BA degree from Presidency College Madras in 1904 with first rank in the University and gold medal in Physics and English. His teachers recommended that he should go to England for further studies. But due to ill health he could not do so and instead he did his MA in Physics from the same college. Describing his life at that time with his professor of physics he said that he enjoyed a measure of academic freedom which was incredible. Those years shaped his future. Then he got married to Lokasundari and moved to Calcutta in 1907 when he was only 19 years of age to take up the job of Assistant Accountant-General with a good salary to work under the Government of India in Calcutta. During this time the diverse and scientific and cultural atmosphere of Calcutta was very conducive and Raman was able to give full expression to his scientific creativity.

As the story goes, one evening while returning from work, he spotted the sign of the Indian Association for the Cultivation of Science at 210, Bowbazar Street and his scientific curiosity made him to knock their door. Soon Raman started visiting the laboratory after office hours and started doing experiments in optics.

Activities of the Association at Bowbazar Street, Calcutta, in the very early years were supported by generous public contributions. It was conceived and planned in the backdrop of the great cultural and intellectual awakening of the nineteenth century Bengal. The original objective of the Association, which continues even today, was to cultivate science in all its departments with a view to its advancement by original research and its varied applications to the arts and comforts of life.

In 1917 after serving for about 10 years, Raman resigned from his government service and took up the newly created Palit Professorship in Physics at the University of Calcutta. Simultaneously, he continued doing research at the IACS, where he became the Honorary Secretary. He fabricated the equipments that he needed for his research and therefore managed his research with meager funds. Raman used to refer to this period as the golden era of his career. Many talented students gathered around him at the IACS and the University of Calcutta. He was president of the 16th session of the Indian Science Congress in 1929. By that time Raman had been elected fellow of the Royal Society in London in the year 1924 and was knighted by the British empire in the year 1929. Then came the award of Nobel Prize in Physics to Raman in the year 1930 for his work done at the Indian Association for Cultivation of Science. This brought glory to Raman and to IACS. The reputation of IACS spread overseas so much so that Arnold Sommerfeld a well known Physicist remarked that "India had suddenly emerged in competitive research as an equal partner with her European and American sisters".

We can divide Raman's time at IACS into two phases i.e. pre 1930 period and post 1930 period. Raman expected that after publication of his paper in 1928 the Nobel Prize in Physics for the year 1929 would be awarded to him. But it was awarded to Prof. Louis de Broglie for establishing the phenomena of wave-particle duality. He

was very restless. But he was so confident that the next year's Nobel Prize in physics will be awarded to him that he had purchased a ticket to go to Stockholm by Ship, as commercial air travel had not started by then, to receive the Nobel Prize much before it was announced. When the 1930 Nobel Prize in Physics was awarded to Raman he was very happy. Success always breeds envy and Raman's success was no exception. Why after receiving the Nobel Prize in 1930 Raman left Calcutta so abruptly baffles many. There is indication that several painful incidents with his colleagues at IACS forced Raman to leave Calcutta. Anonymous letters appeared in the press making the allegation that he favours south Indian students over Bengali students and Physics over other disciplines. His decision to appoint his own student who worked on the Raman effect with him to the newly created Mahendralal Professorship at IACS did not go down well with others particularly because Prof. M N Saha was interested to come back from Allahabad to work at IACS taking that position. Raman was stripped of from his position of Secretaryship of IACS by concerted effort of his colleagues including Dr. Syama Prasad Mukherjee, a Barrister and a politician who was linked with IACS. Thus individual rivalry resulted in Raman's early exit from Calcutta.

Fortunately for him, precisely at that time there was an invitation to become the Director of Indian Institute of Science at Bangalore.

Now we should move out of Calcutta with Raman as he joined the Indian Institute of Science at Bangalore in the year 1933 as the first Indian Director.

**Indian Institute of Science (IISc)** is a public institute deemed to be University for research and higher education in science and engineering, located in Bangalore in the Indian state of Karnataka.

The institute was established in 1909 with active support from Jamsetji Tata and Krishna Raja Wadiyar and thus is also locally known as the "*Tata Institute*". It was granted the deemed to be university status in 1958 and the Institute of Eminence status in 2018.

As the recorded history goes an accidental meeting between Jamsetji Tata and Swami Vivekanand on a ship in 1893 where they discussed Tata's plan of bringing the steel industry to India, Tata wrote to Vivekananda five years later: "I trust, you remember me as a fellow-traveller on your voyage from Japan to Chicago. I very much recall at this moment your views on the growth of the ascetic spirit in India. I recall these ideas in connection with my scheme of Research Institute of Science for India, of which you have doubtless heard or read." Impressed by Vivekananda's views on science and leadership abilities, Tata wanted him to guide his campaign.

Vivekananda endorsed the project with enthusiasm, and Tata, with the aim of advancing the scientific capabilities of the country, constituted a Provisional Committee to prepare a plan for setting up of an Institute of research and higher education. The committee presented a draft proposal to Lord Curzon on 31 December 1898. Subsequently, Sir William Ramsay a Nobel Laureate, was called on to propose a suitable place for such an institution who suggested Bangalore as the best location.

Raman was a brilliant physicist and had got most of the laurels one would dream to have before he came to Bangalore in 1933. He arrived at the Institute with the idea of making it a centre of science of International standard. He found it to be a quiet sleepy place and many people whom he talked were of the opinion that it was a nice place where people drew high salary but did not do any work.

Raman believed that excellent research work can be done only by excellent and dedicated people working in a conducive atmosphere. Therefore he wanted to recruit fresh blood and establish a vibrant atmosphere at the Institute. He started to establish a new Physics department, tried to restructure the existing departments and reorganize the workshops. For revamping the departments he needed money, staff and students. While Raman had no problem in getting very good and motivated students he found it difficult to get good staff and money. At that time a lot of very good physicists were fleeing Hitler's Germany and he had persuaded Max Born to join the Institute leaving Cambridge where he had a temporary appointment. But there was stiff opposition to his move. While all the reforms Raman wanted to bring at IISc were well intentioned it was probably too soon and therefore it

boomeranged. He had difficulties in finding money for research and he allocated most of the money he got from the Tata endowment for the Physics department. For this he was charged with embezzlement of funds. He antagonized some senior Professors of Chemistry and Electrical Engineering Department. These professors resigned in protest. Raman's battle was between excellence and mediocrity where excellence lost. One of the charges leveled against Raman was that he was antagonistic to applied research while Jamshedji Tata wanted Industry to collaborate with Scientists of the Institute to promote applied research. But Raman's view was that while consultancy to Industry should be left to the choice of individual scientists the Institute should give emphasis on fundamental research. Raman himself was involved in consultancy with Railways and many industries of the princely states only after working for many years on fundamental problems. He did not want young people should only be involved in solving mundane problems of the Industry in the absence of any original research. May be many people were not that capable to tackle fundamental problems and therefore they went against Raman's idea. Tata's one of the prime benefactor of the Institute did not support Raman on this as the Director. This created problem for Raman and he faced criticism from his opponents.

A committee was set up which found him guilty and he was asked to resign from the position of Directorship of the Institute in the year 1936 barely three years after he had joined it. Raman resigned as Director but continued as a Professor in the Physics department till his retirement in 1948.

Unlike many of his junior colleagues like Prof M N Saha and Dr. Syama Prasad Mukherjee who were opposing him, Raman was not politically oriented and he refused to be a member of the National Planning Committee of Congress when it was formed before independence.

Raman was made the first National Professor by the Government of India after independence in 1947 an honour which he did not acknowledge. Government of India offered Raman funds for running Raman Research Institute after his retirement but he refused to accept it because he did not wish to be under Government Control.

After independence when Jawaharlal Nehru Started to expand research infrastructure in the country under the specialized institute by being guided by Prof. S S Bhatnagar, Raman was very critical and termed it as Nehru-Bhatnagar effect. He said that like Shah Jahan built Taj Mahal to bury his wife Mumtaz, Bhatnagar is building the specialized institute to bury the instruments that he will buy to equip them. He always emphasized that Universities where research on fundamental science should be going on should be generously funded and the people involved in doing such work should be insulated from the Government and Industry. Today after about seventy years we all realize how correct Raman was and it was a mistake to ignore Universities and promote only applied research. Fundamental research is a prerequisite to applied research and only when we have carried out research to find solutions to our problems in our Universities we then can try to translate them to solve our problems. We have very excellent applied research in the areas of space science and atomic energy for which we have been able to become world leaders and explore space. But where are the Universities where one can go to do fundamental research? Our excellent Space Research was possible due to the dedication of Dr. Vikram Ambalal Sarabhai who is acclaimed as the father of India's Space Research Programme. Very Interestingly he was a doctoral student of Raman at the Indian Institute of Science.

India has done very well in atomic energy research. This was because of the dedicated effort of Dr **Homi Jehangir Bhabha** known as the father of the Indian nuclear programme. He was the founding Director of Tata Institute of Fundamental Research (TIFR) at Mumbai where all research related to nuclear weapons development were carried out. Bhabha was also the founding director of the Atomic Energy Establishment, Trombay (AEET) which is now named as the Bhabha Atomic Research Centre in his honour. TIFR and AEET were the cornerstone of Indian development of nuclear science and weapons which Bhabha also supervised as director. Interestingly Dr. Bhabha after getting his Ph.D from Cambridge, UK started his career at the Physics Department of Indian Institute of Science, which was then headed by Raman.

After joining the Indian Institute of Science in 1933 Raman founded the Indian Academy of Sciences in 1934 and requested the Maharaja of Mysore to give land for the office and conference premises of the Academy.



Maharaja of Mysore was generous in allocating a 10 acre plot very near the Indian Institute of Science. It is in this plot that the Raman Research Institute was built and Raman shifted there after retirement from the Institute of Science in 1948. Raman had started an English Language peer reviewed multidisciplinary scientific journal named Current Science in the format of the popular journal Nature in the year 1932, just before moving out of Calcutta so that scientists working in India can get a platform to publish their work without interference from abroad. He then established the Indian Academy of Sciences at Bangalore in the year 1934 even though he knew that Prof. MN Saha had established the first National Academy of Science in Allahabad four years earlier in 1930. Raman felt the need of starting another Academy of Sciences at Bangalore so that he can build it like the Royal Society of London and publish the Current Science like the popular science journal Nature. This would give him a better control of Indian Science. Raman was the first Indian Scientist to be awarded the highest civilian award the Bharat Ratna by the Government of India in the year 1954. The story goes that when Pandit Jawaharlal Nehru, the then Prime Minister of India wrote to Prof Raman requesting him to come to Delhi to receive the Bharat Ratna, Raman replied that at that moment he was busy in correcting the Ph.D thesis of his student and therefore he would come only after the Ph.D thesis of the student would be submitted.

In October 1970 Raman became sick and was moved to the hospital where the doctors treating him gave him four days to live. He survived and returned back to his laboratory but died soon after on 21<sup>st</sup> November 1970 aged 82 years.

While he was in Indian Institute of Science he had identified a student G N Ramachandran who he had described as a man with enormous potential.

Gopalasundaram Narayana Ramachandran was born in 1922 to Lakshmi Ammal and G R Narayan Iyer who was a well known mathematics professor of his time. His father had got GN Ramachandran admitted for a masters degree to the Electrical Engineering department of Indian Institute of Science when Sir CV Raman noticed him. G N Ramachandran had met Sir C V Raman and had expressed his desire to work with him. With a lot of difficulties Raman could take GN Ramachandran as his Ph.D student in the Physics department and with that a remarkable career in science was initiated. Ramachandran obtained his first doctorate degree working with Raman in Indian Institute of Science in the year 1947. Ramachandran then went to Cambridge for a second doctorate at Cavendish Laboratory. Raman was not very happy that GN Ramachandran after getting a prestigious doctor of science degree under his supervision should go to Cambridge to get another degree. But GN Ramachandran went to Cambridge to get a second doctorate and then returned to Indian Institute of Science at Bangalore as an assistant Professor in charge of the X ray diffraction laboratory in the department of Physics in the year 1949. Raman had left the Indian Institute of Science by then and therefore GN Ramachandran did not have his patronage. Prof. R S Krishnan was the head of the department and several bright young students like Gopinath Kartha joined Dr. Ramachandran's group and they started their work on structural biology..

The University of Madras at that time had a wonderful visionary and educator Sir A Laxmanswamy Mudaliar as the Vice Chancellor who wanted to start a post graduate department of Experimental Physics in his University. He invited Raman to head it. But Raman declined the offer and recommended the name of G N Ramachandran. Dr. G N Ramachandran joined Madras University as a professor in the year 1952 to start a glorious period of X Ray crystallography at Madras culminating in elucidation of the structure of Collagen. At that time Sir Lawrence Bragg was the Director of Cavendish laboratory at Cambridge. He had gathered a group of extremely brilliant persons under the leadership of Max Perutz to solve structures of many proteins which also included Collagen. When in 1952 Dr. G N Ramachandran had joined the Madras University as a professor Prof. Linus Pauling from Cal Tech had published his paper on alpha helical structure of proteins for which eventually he got the Nobel Prize in Chemistry in the year 1954. Prof. G N Ramachandran from his Ph.D days with Raman had hoped that one day he will work on an outstanding problem in Biology. As is known that Prof. J D Bernal an outstanding crystallographer from Birkbeck College London visited GN Ramachandran soon after he joined the Madras University and Dr. Bernal had suggested that Ramachandran should work on collagen one of the most abundant mammalian proteins. Soon a sample of Kangaroo tail collagen was obtained from nearby Central Leather Research Institute and beautiful X ray pictures of Collagen was obtained and analysed.

When in 1955 G N Ramachandran and Gopinath Kartha published their first paper on collagen no one had heard about them. The publication of the collagen paper by GN Ramachandran and Gopinath Kartha in Nature took unusually long time while that by Alexander Rich and Francis Crick took much less time. In their paper Rich and Crick had mentioned that and I quote "Very recently Ramachandran and Kartha have made an important contribution by proposing a coiled coil structure for collagen. We believe this idea to be basically correct but the actual structure suggested by them to be wrong" This actually sealed the fate of the Collagen paper of GN Ramachandran as the scientific community did not accept the structure till it was proved to be correct by further work by G N Ramachandran himself. The criticism that it is stereochemically unsatisfactory and the presence of gly-pro-hydro sequence in collagen is not compatible to the proposed structure prompted GN Ramachandran and V Sasisekharan to develop a general method for describing the stereochemical criteria for polypeptide structure and proteins which they called Ramchandran phi-psi diagram or Ramchandran plot. It provided a basis for describing all stereochemically possible structures of polypeptides. This proved that his collagen structure was right.

Elucidation of Collagen structure should have given Ramachandran a Nobel Prize and his subsequent development of Ramchandran plot to verify collagen structure was enough for making his claim much stronger. But he missed it because he lived and worked in India quietly and he was not in league with protein structure groups in Cavendish Laboratory in England as well as that of Caltech in USA. Further Francis Crick who had not got the Nobel Prize for elucidation of the structure of DNA till then saw him as a rival. It became very clear that excellent research alone will not bring recognition.

The Vice Chancellor of Madras University Sir Laxmanswamy Mudaliar had provided the freedom and funding to Prof. Ramachandran to travel abroad and to interact and to work on any problem he chooses.

After some time when Sir Mudaliar retired the next Vice Chancellor interfered in GN Ramachandran's work. Feeling suffocated Prof. Ramachandran left Madras University and returned back to Indian Institute of Science in 1970 again. Prof Satish Dhawan the eminent mathematician and aerospace engineer was the Director of Indian Institute of Science at that time. Prof. Dhawan requested him to build the Molecular Biophysics group at the Institute. Prof Ramachandran came with his associates like V S R Rao, V. Sasisekharan, C. Ramakrishnan and others. Few others joined him and a good team was established at Indian Institute of Science at Bangalore. But unlike Charles Dickens famous story the Tale of Two cities the story of Madras and Bangalore remained unfinished. Prof. Ramachandran had remarkable success in Madras but his work at Bangalore did not take off. Why? Analysis reveals that Prof Satish Dhawan was too busy with many important assignments including that of ISRO as a result of which he could not give time to solve the funding problems of Prof. Ramachandran. Prof. Ramachandran got a lot of talented and motivated persons to work with him but there was paucity of funds. He applied to UGC to support him to set up another Advanced Centre for Biophysics like he had set up at Madras University earlier. After a lot of discussion the bureaucrats struck back and refused to grant him funds for another advanced centre. Fortunately Prof. Ramachandran had a grant from National Institute of Health, USA which provided him support but soon that was over. At this stage if there would have been a little support to raise funds then Ramachandran's lab would have survived. Prof. Ramachandran used to visit Chicago University when he was in Madras University where he was a visiting professor. After a stint abroad when ever he used to return to India he used to be depressed as he was not able to do what he could do abroad. But the visit to Chicago used to revive energy. But he could not visit Chicago after joining the Institute at Bangalore.

Thus due to lack of money his work suffered but the bureaucracy did not budge. After the death of his wife Rajalakshmi in 1998 Prof Ramachandran's health deteriorated he passed away on 7<sup>th</sup> April 2001 at the age of 79 bringing an end to a glorious career.

Therefore it is very clear that even with talent and hard work it is the people around you who can help you at difficult times. There are a lot of mediocre people who would not allow you to be successful. That is what happened to Sir CV Raman and to Prof G N Ramachandran at Indian Institute of Science.

There are three Science Academies in India which were established one after another between 1930 and 1935. These Academies are supported by funding from Government of India and if they would have created

laboratories, where Fundamental research could have been promoted insulated from interference from outsiders like what use to happen in early days at IACS in Calcutta, then may be there would have been few Centres of excellence built around a small group of talented individuals which would have existed today.

These Science Academies elect Fellows every year and there is intense competition to become Fellows as once you become a Fellow of two Academies or get the Bhatnagar award you get financial benefits from the Government till you are 65. India is probably the only country where this happens.

The gaint structures like CSIR, ICMR and DST have numerous laboratories built by Government support but are they vibrating with new ideas and research activities. One would like to know about their contributions in promoting applied research. These gaint structures were built depriving funds to people like Raman and Ramachandran and many others in Universities. Therefore now we do not have small University like set up vibrating with ideas and energy.

Therefore in order to do science in India one needs not only to have Geschick (skill), Geduld (patience), Geld (money) and Gluck (luck) but also a God father who should be a brilliant and generous person. Where are those type of persons now?

What Raman Could do in Indian Association of Cultivation of Science in Kolkata due to unique cultural and academic atmosphere prevailing in Kolkata during his time, Prof Ramachandran could not do in Indian Institute of Science Bangalore. He never received any recognition for his work from Government of India. While all kinds of civilian awards were given to lesser endowed people, GN Rmachandra was never given any award. The people around him at the Institute of Science let him down.

It is very interesting to note that inspite of significant contribution to India's scientific effort not only Prof. G N Ramachandran but also Prof. Vikram Sarabhai and Prof Homi J Bhabha were not given Bharat Ratna the highest civilian award. This can not be explained.

**0124006 MALLESH, K. S AND AKHILESH, K. S (Department of Physics, Regional Institute of Education, Mysuru-570006). SPIN SQUEEZED STATES: A DETAILED STUDY**

Towards the end of 19th century, classical theory based on Newtonian ideas failed to explain several experimental facts such as the nature of black body radiation, the structure of Hydrogen and other atoms and their spectra, temperature variation of specific heats of solids at very low temperature and so on. Max Planck, Neils Bohr and others came out with ideas radically different from the classical notions and succeeded in explaining these. Later on these new ideas were properly incorporated to propose a new theory called Quantum mechanics. There are several features in this theory which make it distinct from classical theory. Prominent among them are the probabilistic notion associated with measurement of observables, Heisenberg uncertainty principle and the concept of entanglement. The Heisenberg uncertainty principle suggests that the variances associated with observables are such that the product of them for a pair of observables in any state can't be less than certain limit set by what are called coherent states. There also exist quantum states for which the variance of an observable can be quite smaller than that for a coherent state and these are called Squeezed states. In the past two decades several studies have been made on these states in the case of light and multilevel quantum systems in order to focus on the cause for the occurrence of squeezing and also for their realization. In the context of spin systems, this nature is referred to as Spin squeezing and the corresponding states are called Spin squeezed states. Squeezed states are known to play a central role in the manifestation of entanglement and in a quite altogether different context, studies indicate that spin squeezed states can aid in minimizing the noise which may lead to practical improvements of state-of-the-art atomic clocks and frequency standards. The concept of squeezing was first introduced in the case of harmonic oscillator and subsequently it has been extensively studied to other multilevel quantum systems. The work by Kitagawa and Ueda is worth noting in the context of spin squeezing as it not only makes a critical examination definitions of squeezing but also proposes a criterion for squeezing which aims at identifying squeezing as an intrinsic property of a spin system. Wineland et al, Puri and Agarwal have also come up with physical basis for giving equivalent criterion for spin squeezing.

In our work, we have shown that among the two classes of spin assemblies, the oriented spins do not exhibit squeezing where as vector polarized non-oriented systems can exhibit squeezing. We have also analyzed the nature of spin-spin correlations among the squeezed spin states. Our study shows that the existence of correlations is only a necessary condition for the squeezing to be present. We have extended our discussion on spin squeezing to coupled quantum systems. Our study indicates that squeezing for such states with no sharp value of the angular momentum needs a generalization of the squeezing criterion owing to the requirement that the squeezing nature should be associated with the spin-spin correlations. Giving this generalized criterion we have also subsequently looked in to possible Hamiltonians using which squeezing can be generated. Majorana had proposed an elegant geometric representation of multi-level quantum systems as constellation of points on the Bloch sphere. This has enabled us to investigate the squeezing behaviour for higher spin systems. Dicke states, formed out of permuted combination of two distinct orthogonal spinors, are represented by poles on the Bloch sphere. These states are oriented states, therefore, do not exhibit squeezing. However, the symmetric states consisting of two non-orthogonal spinors with any degenerate configurations exhibit squeezing behaviour. In this context, we have also shown that the reduced density matrix technique as well as direct calculation method to detect squeezing give identical results.

**0124007 MITTAL, A. K (Department of Physics, University of Allahabad, Prayagraj-211002). REFORMING SCIENCE EDUCATION FOR ‘BETTER SCIENCE’**

As a consequence of the dramatic positive impact of technological advances in many walks of life, we value science for its potential to solve all our problems from poverty and disease to inequity and injustice. Unfortunately, the science has not benefitted everyone; a significant fraction of humanity continues to live in conditions of extreme deprivation and indignity. More alarmingly science has brought all of humanity perilously close to extinction.

In this paper, the term ‘Better Science’ means not only creation of more reliable knowledge, but also better use of scientific knowledge for human welfare. Reforms in science education should have two objectives. First, to ensure proper conceptual understanding of content knowledge along with inculcation of scientific temper. Second, to develop the ability to make value judgements related to the use of this content knowledge.

There is a need to promote extensive subject specific education research, which seeks to explore issues related to teaching a specific subject in a scientific manner. In particular, such research helps in identifying students’ misconceptions and explore instruction techniques that can help students overcome their misconceptions. Subject specific education research has also demonstrated the importance of teaching explicitly about scientific thinking, science methodology and scientific temper in the context of specific science topics.

Subject based education researchers are also concerned with reliable and validated assessment of learning outcomes. Findings from such research should guide reforms in examinations to make them more meaningful, purposive and scientific. Just as objective measurements in science requires standardizing the scale of measurements, standardization of the testing scale is essential for unambiguous measurement of learning. Learning needs to be measured by the thinking and doing skills acquired rather than the duration of the course and marks obtained in exams of doubtful validity. Despite the pivotal role that examinations have in the educational system, most teachers are not even aware of the existence of extensive scientific literature on assessment techniques. Examination reforms should also address unhealthy ‘exam anxiety’ which has assumed alarming proportions. Repeated low stake formative tests around a specified learning goal till a student demonstrates mastery, can ensure that desired learning outcomes are achieved without exam anxiety.

However, pursuit of subject based education research requires flexibility in the education system to allow for different teaching and assessment techniques. Flexibility in education is also required to develop and utilize the wide diversity in aptitudes, interests, abilities and goals of students to meet the diverse needs of society. Multiple decentralized educational systems should be allowed to emerge in response to this diversity. Edu-diversity is as important as bio-diversity and eco-diversity. Unfortunately, there is a tendency in education for increasing centralization, uniformity and control, which instead of harnessing human potential into socially useful directions, helps sustain ritualistic, hierarchic, competitive and greedy society.

Incorrect perception of science, as the study of specific subjects like Physics, Chemistry, Biology etc. makes the teaching of science facts in specific subjects the main goal of science education. Presently science education almost exclusively focuses on development of technical expertise in some science subject. There is very little emphasis on inculcating scientific temper. The emphasis is on the products of science and not the process of science. But it is the process of science that ensures a continual improvement in our understanding of how Nature works. Science education should emphasize this process of science. Scientific inference is based on explicit and tacit assumptions; it is never final and is always tentative. Yet, contrary to its true nature, science is presented as a body of certain knowledge, discouraging a questioning attitude and exploration of alternative ideas. As a result, students emerge through science education without proper appreciation of the true nature of Science.

Moreover, science education creates an attitude of indifference towards how science is used. Thus, aided by other socio-economic forces, science education helps produce large numbers of specialists in narrow fields. They form communities of practitioners with their own rules of transactions, having little concern for scientific temper or how their expertise gets used.

Science education should also impart an understanding of social issues pertaining to application of science. Value Education should be an integral part of Science Education. It should encourage cooperation and not competition.

**0104008 NANJUNDIAH, VIDYANAND (Centre for Human Genetics, Bangalore). COOPERATIVE BEHAVIOUR IN MICROORGANISMS AS A CONSEQUENCE OF 'SOCIOLOGY', NOT JUST GENES**

Highly organised group life is common to humans and cells, but we view the phenomenon very differently in the two cases. The views can be described as sociological and genetical, respectively. How can we understand the evolution of group living? In the case of microbial life, two types of explanation have been offered. The first is, again, a gene-based explanation. It invokes natural selection acting on the consequences of new genes that make group living, or sociality, possible. The second explanation stresses the novel ("emergent") behaviours that simple interacting units that can exhibit when put together. The second explanation can be termed 'sociological'. It is common in the physical sciences too, and – curiously – also in the social sciences. What are the relative merits of gene-based and individual-based explanations for the origin of sociality in microbes? And what lessons can we draw from that for understanding aspects of group life in other organisms, including those aspects that fall under what is called culture?

**0103009 PARANJAPE, BINDA (Department of History, Banaras Hindu University, Varanasi-221005). LANGUAGE AND CULTURE: SHIFTING PARADIGMS**

Interface between language and culture is multidimensional. The abstract elements of culture can be comprehended primarily through language. One may claim to have an experience of spiritual ecstasy but if it comes to communicate that experience, it will eventually be through language. Any communication other than the linguistic one has immense limitations. Language communication takes place in a realm where the coding and decoding of the messages are regulated by a system shared by the same language speakers. Aspects of material culture, for the convenience of the study of culture are separated from the abstract elements like thoughts, so as to understand the nuances of human involvement in creating objects out of the natural elements available around them. All such objects have names to differentiate one from the other, and name is essentially a linguistic category. Thus both the aspects of culture, material and abstract are embedded in, and communicated through language. In Indian tradition some philosophers tried very hard to imagine something beyond the formula of 'name and form' (Nama-rupa) by introducing the idea of a 'Supreme Brahman'. Brahman is said to be a principle beyond any definition. Interestingly volumes of literature are produced to say how Brahman can not be defined. Since the entire discourse on Brahman can not be separated from the medium that is language through which it was presented, the upholders of the idea of Brahman attached a lot of mysticism to language. Brahman is said to be everything, logically then language is also Brahman and Brahman is 'Anirvachaniya'. In this formula the impossibility of definition of

Brahman is taken as a limitation of language. The question is how to communicate even this idea that there is something beyond human language? This issue to some extent was resolved by the Indian philosophers by accepting the principle of understanding reality on two planes, as 'Laukika' and 'Alaukika' by which a major breakthrough was achieved. According to this classification of the levels of reality, the 'Laukika' could include language as a tool for reaching up to the ultimate reality and 'Alaukika' was to be understood as something beyond the capacity of humans to reach up to. (Ordinary and Extra-Ordinary Perception of the Nyaya system) Had it not been the case any objective study of language would not have been possible. Since language was brought under the rubric of theoretical postulates an important branch of study of language, viz. Grammar could develop in India. All kinds of collections of codes, the 'Shatras' as they are called also could be compiled by keeping the idea of non definable 'Brahman' intact. Coming to the discourse on culture, the Indian model of perceiving reality on two planes helps us to understand the use of language by the Indians in codifying the social norms, aspirations, ideals and many more of the cultural paradigms.

In ancient India, the earliest evidence of recognizing language as a cultural category is found in the Vedas. Vedic people attempted to make lists of the words in the Vedic literature, there were painstaking exercises in etymology and of ensuring phonetic precision, (Padapathas, Nighantu, Nirukta), grammar was included in the group of auxiliary sciences (Six Vedangas: Shiksha, Kalpa, Chhanda, Nirukta, Vyakarana, Jyotish) essential for Vedic learning. All these provisions point out towards a conscious effort in maintaining a strict control over the transmission of the Vedic texts. One was to be worthy for getting a custody of the Vedas. Preservation and transmission both were bound by the rules, supposedly agreeable to all the members of society. One important social function associated with this set of literary works was the ritual of sacrifice. Performance of sacrifice was at the nucleus of all the socio-cultural activities. It was advocated for the maintenance of the cosmic and natural orders. The sacrifices were considered essential for ensuring the timely rains, good progeny, many cattle, winning the wars, etc. But it can yield these desired fruits when the rituals and more importantly the chanting is done properly. Some special power was attributed to words, thus in Nirukta, Yaska developed the science of etymology and has tried to fix meanings of the words of the Vedic hymns. The change of the meaning acquired by a word subsequently may not be the one that was intended by the original composer or the Rishi (seer), and in that case the desired effect will not be achieved. Through different endeavours safeguards were created to guarantee the non alteration in the Vedic texts. This is indicative of two hypothetical possibilities, one that there was a threat of interpolation attempted by the people belonging to the same cultural and linguistic groups or people belonging to other culture and linguistic group trying to create a parallel system of knowledge and establish its legitimacy.

Historically speaking the people who preserved the Vedas as their sacred and secret knowledge were having conflict with other cultural groups for the supremacy over lands or for the possession of each others animal herds. What we learn from the Vedic texts is that the otherness of the non Vedic groups was expressed in terms of their non impressive physical features and their language. The people identified as others could be either incorporated by sharing the language or by performing certain rituals and make them worthy of inclusion. Marriages can be another assimilative process. Conflicts over the possession of lands or animal herds and the assimilation of different culture groups was taking place simultaneously throughout the Vedic period. One can get a glimpse of these processes through some of the dialog hymns contained in Rigveda. For example the famous Sarama-pani dialogue. (Rigved X.108.1) Sarama is probably a female dog or a goddess and Panis were the non Vedic people. Sarama is undoubtedly a mythical character, but what about the Panis? Their act of the stealing the cows gives an impression that they must be some cattle raiders and the dog, usually accompanying the animal herders is sent for the search of stolen cows. The question here is in which language these two groups communicated with each other? Is it a mere coincidence that Sarama is also said to be a deified speech? The exact identity of Sarama is difficult to be fixed, none the less if it is taken in the sense of human speech it can be conjectured that the hymn refers to the difficulty in communication in absence of common language, hence Sarama, the speech goddess is invoked to have dialogue and negotiations with the Panis, speaking the non Vedic language.

The post Vedic period marks one very important development. It starts searching for the alternative ways for knowing the nature-human relationship. Vedic deification of the natural forces and prescription of sacrifices for their appeasement through chants was still recognized but the power of speech was supposed to have increased by the element of Tapas. Thus a Tapas could pronounce a curse to punish the Supreme God like Indra for his misdeeds.

Deified natural elements like Surya (Sun) or Vayu (Wind), was expected to produce progeny from a human female with the help of chanting of a Mantra given by a Tapas/ Rishi. This power of speech described in the Vedic and more in the Epic literature was never brought under the scrutiny of linguistic enquiry. The combination of human speech and divine powers was accepted without questioning it.

During the post Vedic period there arose a tendency of questioning the validity of the Vedic rituals. Vedic chants and mythologies along with the sacrifices started getting replaced by respecting the value of sharing. The sacrifices were still performed but by and large society was moving away from it. The principles of non killing and developing an institutional nexus between the ascetics and lay followers started empowering people from different walks of life. New elites, different from the royalty and priesthood emerged due to vibrant trade activity and vast stretches of land coming under plough. Jains and the Buddhists emerging approximately in sixth century B.C., evolved a set of teachings where a person is responsible for one's own spiritual and material progress. (Dhammapad) There is no need for any priest to perform rituals to ensure the well being of people. These teachings showed the way for doing away with Vedic rituals and Sanskrit language. Both Mahavir and Buddha adopted languages other than Sanskrit and subsequent to the life time of these preachers enormous mass of Buddhist and Jain literature was produced in the Prakrit variety of languages.

Over a period of time Prakrit started gaining royal patronage. It became a language of literary creations. Non religious texts like romantic tales, didactic tales, biographies, heroic poems were written in Prakrit languages. It was also used for the royal announcements and donation charters. Asokan inscriptions in Prakrit is a valuable treasure of Indian epigraphy. During post Mauryan period many rulers used Prakrit for the inscriptions. Many lay followers making donations to express their faith in Jainism and Buddhism are recorded on the hard rock surfaces giving us a glimpse of the use of non Sanskrit languages. Many poets have expressed their pride in the expertise in Prakrit language. Prakrit as a language seem to have taken a challenge of countering the hegemonic position of Sanskrit. In Gauda Vaho, Vakpati the composer of this Prakrit biographical text (approximately dated to eighth century A.D.) praises the Prakrit language and shows how it is more powerful than Sanskrit. In his words, "New subjects, rich compositions sweet on account of the softness of their words: these have nowhere abounded, since the world began, except in Prakrit. All languages enter Prakrit, all languages are derived from it; for all waters resort to the ocean alone, and, from the ocean alone all waters take their origin." (Verses 92-93) ----- "For those who have remained ignorant of the excellent features of the Prakrit, we only have pity, but no sad feelings." (Verse 95).

Thus, before presenting the main text the composer is conferring an exalted position upon Prakrit. On the other hand one finds stereotypical comparisons of Prakrit with Sanskrit. Rajashekhara a great scholar of Sanskrit poetics, in his Prakrit drama Karpurmanjiri, describes Sanskrit as hard and Prakrit as soft like the tough man and delicate woman. However, this does not do away with the dominance of Sanskrit, given the patriarchal society of Rajashekhara's times. (Tenth century A.D.)

As a result of the proliferation of Prakrit, probably Sanskrit started becoming more and more rigid and restricting its reach only up to a certain class of society. Sanskrit drama is a best case to study how the social hierarchy of the characters is expressed through the language they spoke on stage. Women and commoners are marked by their use of non Sanskrit languages in the drama. This exclusivity given to Sanskrit by the Sanskrit scholars created a big gap between the world views shaped by the learned people in India and of those who largely remained uneducated and illiterate. Between the Sanskrit educated and those who were totally away from the formal schooling, there was a layer of those who preferred Prakrit for their literary creations, and appear to be very proud of their mastery over Prakrit. Here one may see Rajashekhara a great scholar of Sanskrit poetics as an example. Rajashekhara wrote Karpurmanjari a drama in Prakrit and unlike the convention of Sanskrit drama, all the characters in the drama speak in Prakrit. There is no distinction in class so far as the language is concerned. (A history of Indian literature (500-1399) from courtly to the popular, by Sisir Kumar Das, Sahitya Academy Delhi 2005, p. 61). Having quoted that, one still has one question to answer, that is regarding the occasional use of Sanskrit by women and the lower class characters in the classical Sanskrit dramas. It is certainly not common but one can see an example of it in Abhijnana Shakuntalam of Kalidas. In this drama Priyamvada uses Sanskrit only in one scene. It is interesting to see the plot here. Priyamvada is quoting a prophecy and that being a divine announcement she uses

Sanskrit. The point is that she is not using it for herself. Therefore, even in this example, the exclusivity of Sanskrit is highlighted. It goes without saying that some formal training of Prakrit must have been there and there must have existed academies of experts to appreciate the works composed in Prakrit. Due to Royal patronage and the centers of learning having their own source of sustenance non Sanskrit learning also flourished in India during the early medieval and medieval periods.

Question can be asked regarding the relation between Sanskrit learning and Prakrit learning. From the literary source available to us it seems that those who used Prakrit as the language for their literary activity also knew Sanskrit very well. They almost use the same imageries and very often same themes. Thus the change of language in true sense does not usher a change in the world view of the formally educated persons. May it be any genre, the tendency to copy the Sanskrit counterpart is pretty evident. Comparing Prakrit with Sanskrit and saying Prakrit is more beautiful by the Prakrit poets is more a cliché than a real comparison. In such a situation the historians have to look at alternative sources more carefully to understand the level of language learning in the formal way. A vast majority of people appear to be out of the learned circles. Access to education for such people was restricted to their professions in an informal way and for the society at large it was through the professional story tellers and religious preachers. A fact that the quality of professional training was very high can be testified with examples coming from the field of architecture. Huge and enigmatic by appearance, the monuments of different historical periods provide a window to know about the training received by the craftsmen and engineers. Constructions of different kinds of water reservoirs, wells, step wells, temples of magnificent sizes and exclusively decorated, forts, monasteries, all point out towards skill training on a large scale taking place in India. Some of the inscriptions mention the names of master craftsmen and the architects, and majority of those mention the patrons of that activity. There are Sanskrit texts on the architecture and engineering called the Shilpashastra texts but all the creations are replete with the individual choice of designs and forms. This can be interpreted in two ways, one that these texts were mere guidelines for a general planning of the activity and the scope for improvisations was kept intact. Second interpretation can be that the majority of the architects have a notional connection with the texts and they had their own ways of training the apprentices and creating their own set of helpers. If it was not the case then one has to accept that Sanskrit was taught to all such aspirants who wanted to take career of an architect, but that does not appear to be the case. Some historical source material is available for understanding the training given in languages other than Sanskrit. A recent book in Kannad language written by S. Settar, titled 'Prakrit Jagdvalaya' (Prakrit Universe) has a whole chapter on architectural and aesthetic terms developed by Buddhist sculptures and architects. Settar dates it prior to Sanskrit and Pali texts on the subjects. (Book review in The Hindu, 15/11/2018)

The spread of knowledge about the religious faith was through the sculptural narrative panels and probably some professional were there to verbally narrate stories about the saints and the preachers from the past. Mass education of this kind is still common in India. Large number of people congregate to listen to the preachers learned in the religious philosophy and having the skill of effective communication. They create an awe by quoting from the Sanskrit texts, which the commoners are far away from, and their main teachings will be in the language of the people who are gathered. Thus the exclusive position of Sanskrit remains intact and a subtle message is passed on that it is not for the consumption of the commoners. A major challenge to the hegemonic position of Sanskrit was posed by the medieval Varakari and Nirgun saint poets of medieval period. Majority of the the Brahmins held Sanskrit as the language of the Gods, since the Vedas were composed in Sanskrit, and by corollary it is the language of pure knowledge. Eknath, a medieval saint poet questions this position in strong words, he asks, "If Sanskrit is created by the Gods, then is Prakrit created by the thieves?" Tulasidas, also has expressed reservation about the people who were upholding Sanskrit as the superior language and their view that the languages other than Sanskrit were not fit for any divine revelations.

Tulasidas is credited with composition of Ramayana in Avadhi language, originally a Sanskrit classic and there by empowering the people of Avadhi speaking belt with the knowledge of their cultural heritage. The question is how much and to what levels this text was received? Did people appreciate and honour Tulasidas because he gave a blow given to the authority of Sanskrit in the field of practicing religion or it is because the structures of hierarchy more evident in the upper classes could gain legitimacy for its creation and perpetuation among the lower strata of society? For those individuals who were feeling the helplessness before the oppressive forces of power, Ramacharitmanas of Tulasidas created an opportunity to give vent to their feelings in their own language. This could have served two purposes, one that it did not invoke challenge to the authority of the upper castes in the realms of their intellectual pursuit and second that it could bring such people together for forming their own sectarian niches.



Coming to the present day situation, neither Sanskrit nor other languages serve the purpose of imparting formal education to a large section of Indian population. In a land of multitudes of illiterates today, does it really matter, whether, during different periods of the historical past people held some strong views regarding Sanskrit or languages other than Sanskrit? It does matter, because the language is intrinsically related to the social positions in India. Sanskrit as the language of empowerment was soon replaced by English as soon as the British supremacy was established. Prior to that during the pre-British period Persian was a court language throughout North India and it was mastered by the elites of the society. It is interesting to see a proverb popular in the Hindi speaking belt, 'Hath Kangan ko arasi kya, padhe likhe ko Farsi Kya?' (one does not need a mirror to see the bracelet, in other words it is too simple to know, and there is no difficulty in knowing a written document to a learned person even when it is written in Persian). In other words may it be Sanskrit or Persian, the language of formal education was much away from the reach of the commoners.

The choice of language as medium of instruction for schools during the British period was a matter of debate. Many of the the educated youth felt a sense of pride in being English educated. By and large vernacular languages were preferred for primary levels and for matriculation and further levels of higher education one needed to take examinations in English. Thus English and higher education became synonyms. Soon the divide between vernacular educated and English educated started widening. There were two reasons for this divide. First that the education in English opened up access to some of the Government records and court proceedings. The second reason is peculiar to a multilingual situation like Indian one, that the English language became a lingua franca for the Indians who were experiencing a new awakening of Indian Nation. English was the window for communication with and resistance to the British power. Braving against the British oppression was possible by writing in English and making it known to the world. There is a subtle recognition of the British folk having the power of political domination by way of accepting English as a powerful language. Vishnu Shastri Chiplunkar almost hundred and fifty years ago called the English language as the milk of tigress. Though there were Indians who started advocating the cause of regional languages as early as the close of eighteenth century but those voices got subsumed in to the larger design of Hindu religion trying to retain its supremacy in the days of western, non Hindu influences on one hand and Muslims on the other. So far as the Hindi language is concerned it was pushed back by Urdu and subsequently by English and raised the anxiety of the Pandits at places of traditional learning, like Varanasi. In 1868 Shiv Prasad alias 'Sitara-E-Hind' a Joint Inspector for schools under the British, expressed his concern regarding British policy of not introducing English for the masses. According to his views if not English it will be Persian/Urdu as an alternative and that primarily, due to script, keep a large mass of people out of the orbit of formal education. Another visionary from Varanasi, Bharatendu Harishchandra also shows alertness regarding the language for formal education, however, in a different direction. He upheld the banner of Indian languages like Hindi and emphasized on the richness of those. He championed the cause of Indian mother tongue and opined that the knowledge can be acquired from any direction but it must be internalized through mother tongue.

“निज भाषा उन्नति अहै, सब उन्नति को मूल ।बिन निज भाषा-ज्ञान के, मिटत न हिय को सूल ॥  
विविध कला शिक्षा अमित, ज्ञान अनेक प्रकार।सब देसन से लै करहू, भाषा माहि प्रचार ॥“

[“Progress is made in one's own language (the mother tongue), as it the foundation of all progress. Without the knowledge of the mother tongue, there is no cure for the pain of heart. Many arts and education infinite, knowledge of various kinds. Should be taken from all countries, but propagated in the mother tongue.”]

**- Bharatendu Harishchandra, 'Taken from his famous poem, मातृ-भाषा के प्रति (For the Sake of Mother-Tongue or Towards Mother-Tongue)'**

However, these kind of sentiments did not culminate in enriching the so called native languages so as to prepare the native language speakers to face the challenges of the western domination in the field of knowledge. Sanskrit Pandits and Persian scholars continued getting respect but the regional language speakers had to always wait for their turn sitting in the back row. India had to wait for a few more decades to gain self confidence vis-à-vis

language, and truly speaking the Indians are not yet completely out of the inferiority complex vis-à-vis their mother tongues.

The pride and power associated with English is still seen in India. It is considered to be a source of empowerment of the marginalized. The challenge before the upholders of this view is how to bring the marginalized to formal stream of education and that too in English. Ambedkar's message of 'Educate, agitate and organize' along with his strong support to English language teaching for the Dalit was to be materialized. Christian missionaries are imparting education in English and a number of Dalits send their children to those schools but it is not sufficient to create a mass awareness regarding English education among the Dalits. Some Dalit thinkers tried to propagate it through religious affiliation. A temple dedicated to Goddess English in the village Banka, Lakhimpur Khiri district, Uttar Pradesh as a mark of Dalit Empowerment is a classic example of such an attempt. New iconography, new rituals, all point out towards discarding the existing structure of oppressively exclusionary caste system and the recognition is given to English language as an emancipator. (A temple for a language, article by Mini Krishnan in *The Hindu*, April 2017) The activity of this temple building started in the year 2010 and soon media took a note of it from many places including BBC. (An 'English goddess' for India's down-trodden By Geeta Pandey BBC News, Banka village, Uttar Pradesh, *South Asia*, 15 February 2011) An interesting comment coming from a Muslim lady reported in media says that she wanted an English Mosque where the Namaz will be offered. The general perception of English language as a liberator for the lower caste people is absolutely evident in day today life. Majority of Indian population is in favour of English medium schools. Many renowned schools, originally having local languages as medium of instruction got converted in English medium schools, completely or partially. In November 2019 Government of Andhra Pradesh took a decision of introducing English medium Government schools. Dalit organizations welcomed the decision by organizing rally having teachers, students, parents participating in it. Interesting to note that the right to education is modified as right to English Education here. (Introducing English medium in govt schools for benefit of poor: AP Education Minister, India Today, 19<sup>th</sup> November 2019. "There is a Right to Education in the country and now Jagan government has upgraded it to Right to English Education," Suresh said. Andhra Pradesh Education Minister Adimulapu Suresh.)

From visionary like Mahatma Gandhi to many thinkers and writers of different languages have time and again highlighted the importance of mother tongue as the medium of instruction for school education but they seem to be ineffective in present times in India. The reasons for this failure are in various spheres. The state policies, curriculum building, economic compulsions can be a few of those. It is not just for the Dalits even for the tribal people the use of English language for schooling is considered to be desirable, as has been mentioned earlier in case of tribals of Andhra Pradesh.

Another issue with language is related to regional identities getting translated in formation of states in India. Majority of states in India are formed considering common language as the predominant feature. As will be expected in this kind of political and administrative division the people who do not share the language with majority, become marginalized. One of the glaring examples of this kind is the Belgavi issue related to Karnataka-Maharashtra boarder. Even after almost sixty years, in the year 2018 and 2019 appeals were made to the Prime minister of India to resolve the problem. The practical difficulties enumerated in these appeals are related to property verification papers, Government schools of Kannada medium and not of Marathi medium, public information like the destination boards on the state transport buses being in local language, etc. The demand is of including Belgavi town and 865 villages in the state of Maharashtra. The case is pending in the court for more than fifteen years. Thus the boarder dispute is for many a linguistic identity issue, in its core. For the political parties thriving on the ideology of identity politics the boarder related linguistic issues come handy at the time of elections. Such parties make emotional appeal to the voters that their party, if in power, will ensure the protection of respect of your language will remain prime on their agenda. The question is of assessing the impact of these appeals on the voters. Gradual increase in the power of the regional parties hint at the success of such identity politics at regional levels at least in a few states of India.

In the history of struggles related to linguistic issues in India Konkani language certainly deserves a commendation. The people of Goa showed a high degree of conviction towards an independent status of their language and succeeded in proving it by having it included in the eighth schedule of constitution in 1992. It is

interesting to see how the Konkani language speakers fought against the historical convention that Konkani is a dialect of Marathi and not an independent language. In addition to creating literature in various genres like, short stories, novels, poems, etc they undertook strenuous work of bringing the Indian classics in their own language. Epics like Mahabharat and the biography of Buddha can be quoted as examples. The credit of this movement is not restricted to the net outcome of inclusion of Konkani in the eighth schedule of the constitution, the Goans are also showing alertness about the future of this movement and they are critically examining the present status of their language. They are posing questions related to creation of knowledge in Konkani and suggestions are coming forward in regards of interdisciplinary studies through Konkani. A realization that the present activity of language limited to the field literature and linguistic studies will not suffice if the language is expected to survive in the age of Euro-centric discourses and technological advancements. The lack of classics could be resolved with effort since the literary skills were in place, but for facing the challenges of forever widening horizons of knowledge this hind glance will not be useful. New vocabulary, new style of discourses, multidimensional knowledge sharing is required and the Goan intellectuals are expressing concerns about it. In Goa, the earlier generation people spoke their language at home, studied in Marathi medium schools, and a few of them gained higher knowledge in Portuguese. Now the situation has changed, there are Konkani medium schools, the official language of the state is Konkani, but the creation of knowledge in Konkani is still a far off dream. (Dr. Yugank Nayak in 'Jag' a Konkani magazine, Year 43, issue 1, August 2019.)

Other than the state languages there are a number of linguistic minority groups in India, and all are facing serious challenges vis-à-vis cultural enrichment through language. Cultural festivals, cinema, magazines and news papers, television serials are some of the fields claiming to have potential of giving life to the minority languages, but in true sense they mere perceptions than being real. Partition of India posed a real threat to one of the rich and vibrant language of India, viz. Sindhi. A Pakistani newspaper headline on 21 July 2018, 'Is Sindhi an 'endangered language' also is true for Indian Sindhi speakers, or more so for Indian Sindhis. (Mazhar Ali Dootio, Daily Times) Similar concern about a language being endangered is expressed about the language of a minority population of the Parsis in India. Originally from Iran and a Persian speaking community, adopted Gujarati as their language, however, the language they speak is not Gujarati *per se*. It has a character of its own. A Russian scholar is making oral archives of Parsi Gujarati since he feels the fear of this language loss. (Written by Bhavya Dore on Anton Zykov, in Live Mint, 8 April 2019)

Language loss is perceived as a culture loss by many thinkers. However, very often the discussion starts getting coloured by various biases like, religion, caste, levels of perceived sophistication, etc and invariably the concluding remarks sound Utopian. The concerns are real but the solutions are many a times, impractical. Will that mean that the language loss is to be accepted as destiny of a language and the speakers of a particular language or it means that more thought and efforts in the right direction are required? State certainly has a big role to play, but the increased awareness of the people from different walks of life has to create a foundation for the state policies to be decided and implemented. In this regard, some experts in the field of technology show confidence in their ways of language preservation by way of machines. But those who lay emphasis on the living experience of language show scepticism about the mechanized preservation of language. Another set of experts believe that the countries who brought the knowledge related to various sciences and technologies developed in the foreign languages speaking areas in their own can serve as a model for India, and Indians also should try to upgrade their languages so as to suit modern sciences and technologies and discourses related to that. But that has a danger of promotion to aping culture. As the languages so are the sciences and technologies rooted in the soil. Adoption of foreign technologies through foreign language or even through the information transmission in indigenous/ local language, the possible danger of unidirectional flow of knowledge is inevitable.

One more issue related to language and culture is of scripts. In India a number of languages are spoken but those have not developed their independent scripts. The example can be again of Konkani as a standard language of a state. It was earlier written in different scripts like Devanagari, Kannada and Roman, however when it was included in the eighth schedule Devanagari was accepted as its script. Now the question is how to keep the contact of Konkani language with the Kannada and Roman script knowers intact? Also how to equip the Konkani speakers with the knowledge that is written in the scripts other than Devanagari? There are some languages which have a script of their own and those have been placed in the eighth schedule also, but there is no enforcement of the script

associated with it. Santhali is an example of this problem. (The constitution (ninety second amendment) Act, 2003) In whichever state Santhali is taught the script of that state is adopted for this language. This situation certainly points out to two major challenges the Santhali speakers can face. One is of the dominance of the state language over Santhali and there by the Santhali speakers and another issue is regarding the trouble that the Santhali speakers will be facing in written communication. Santhali is a language spoken primarily by a tribal community. The other tribal languages are likely to face the same problems if the proper policies are not developed and strictly implemented.

In all the discussions related to language and culture something that demands an immediate attention is the the deaths of languages. These days one hears about the interfaith dialogues very often, more so in a volatile situation created by mob frenzy leading to eruption of violence, but the interlanguage dialogues are not that common. Social inclusive policies must create platforms for such dialogues, so as to build confidence in the minds of the marginalized. The acute pressure on the minds of the refugees or certain minorities targeted by the hate politics are forced to change their speech. Other serious concerns are regarding the English medium schools. Children are forced to speak English at home when the other members of the family freely use their mother tongue for communication. This is another site where the language death takes place. Some English medium schools go to the extend of punishing the students for speaking in a language other than English. All these are potential situations for violence and conflict. Restrictions of this kind legitimize violence in the name of discipline or in the name of larger interest. Peace building through interlanguage dialogue can be a new paradigm in India, where the languages are dying and so are the speakers of many languages. One of the strengths of India is a large number of spoken languages, which means more experiences, more wisdom and more achievements to the human kind. The need of the hour is to rise up to the challenge of language deaths and try to stop it.

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MINERALS SCIENCE – FOR SOCIETAL APPLICATIONS AND SUSTAINABLE DEVELOPMENT**

In this talk, recent advances in mineral chemistry and its applications to environmental issues and other societal needs are reviewed. Mineral chemistry and recent research filed nano-geoscience require the adaptation of the most modern nano-scale analytical experimental methods in understanding the role of different molecular species in improving environmental sustainability using naturally occurring minerals . This is a trans-disciplinary research with immense applications involving overlapping research fields such as Geochemistry, Environmental Geology, and mineralogy. Anthropogenic inputs of toxic elements and pollutants into our environments are ever increasing , and the role of minerals in the biogeochemical cycling of toxic elements, natural nanoparticles, are most important in reducing the harmful effects of toxicity and improvement in sustainable development. We shall discuss the role of naturally occurring hydrous minerals and other select hydrous minerals in environmental applications with a specific reference to hazardous chromium and arsenic management.

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**Key word: Environmental management, Earth sciences, Water future, Future Earth, Sustainable development, Mineralogy, Deccan Trap.**

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**0125011 Ramamurthy, V. S (National Institute of Advanced Studies, Bengaluru-560012). MANAGING PUBLIC PERCEPTION AND PUBLIC ACCEPTANCE OF PUBLIC RISK (AN EMERGING CHALLENGE OF S&T DOMINATED 21<sup>st</sup> CENTURY)**

Science and Technology have always been an integral part of the evolution of the human civilization since time immemorial. Twentieth century was a turning point in the history of Science and Technology and therefore in human history. The last few decades of the nineteenth century and the early decades of the twentieth century saw a series of path breaking scientific discoveries, that too in quick succession, that literally pushed our understanding of the material universe almost to its limits. The scientific discoveries led to new technological discoveries. For example, semiconductors were known for a long time but semiconductor electronics was a development of the twentieth century. New technological developments led to new instruments with far superior capabilities and in turn led to new discoveries. The Science-Technology-Instruments-Science bootstrap was a twentieth century phenomenon. Twentieth century was also a turning point in the way in which scientific research is carried out. Historically, scientific research has always been the prerogative of curiosity driven individuals. Most of the path breaking scientific discoveries of the late nineteenth century and early twentieth century were by such individuals. The well-known Manhattan project changed all that. Begun modestly in 1939 following the discovery of nuclear fission and the fission chain reaction, the project grew to employ more than 130,000 people and cost nearly two billion US dollars. The project led to an irreversible change in the way in which scientific research is carried out, technologies are developed and taken to their desired end use and mark the beginning of a new era in the history of scientific research. I call it a transition from Research to Research Enterprise, a transition from research driven by individual curiosity to research driven by collective goals. Another important development following the Manhattan Project is the emergence of high technology products and services in the market place. While some of these came out of the Manhattan Project itself, the decades witnessed an increasing role for non-government business entities to invest in research to dominate the marketplace both in terms of new products and services and in terms of market

competitiveness. The research enterprise model enabled business houses to invest in research as a part of their business strategy. I call it the Science-Technology-Business-Science tango.

Where are we today? We can say without reservation that the scientific discoveries of the twentieth century in the communication, computation and transport sectors have shrunk the world into a global village. It will not be an exaggeration to say that there is no aspect of human life today that has been left untouched by Science and Technology in some form or another.

What the future looks like? Predicting the future has never been easy. In fact, it is said that the future has the nasty habit of proving all predictions wrong. There is no doubt that more new technologies will emerge, more products and services will become available and we will reap the benefits of these as they emerge. I will not even attempt to forecast these technologies. The fast changing world of today has also brought a few challenges to society as a whole. That is what that I want to talk about today.

In general, any new product or service arising out of a new technology starts off as the “luxury of the rich”, exclusive and over-priced. I always say that there are three A’s for a new product/service to evolve as a friendly neighborhood product/service- Accessible, Affordable and Acceptable. Products and services that are not found readily accessible, economically affordable and socially acceptable disappear from the market place in course of time. One of the possible reasons for non-acceptability of a new product/service by the public is some risks associated with their wide spread use.

It is true that zero risk options do not exist in life. At the individual level, one always carries out a cost-benefit-risk analysis and accepts or rejects the product/service. When it is a question of public risks, how do we handle it? Often, the risk bearers may not even be beneficiaries of the product/service. Traditionally, one looks at the Government as the custodian of public good and public risk. The government is expected to put in place measures that balance public benefits, public costs and public risks through fiscal, regulatory or any other measures. It is interesting and informative to look at how we have handled new technology products that carried large scale public risks in the past.

The first example that comes to my mind is X-ray radiography. While the potential of X-rays for imaging of bones became apparent almost simultaneously as its discovery in 1895, the hazards associated with an overexposure to the radiation became known only a few years later. The early discussions did centre on a ban on the use of X-rays for radiography of any kind. It was soon realized that the balance of advantage lies in a sensible use of the technology. That was the beginning of the evolution of radiation safety standards and today the regulatory system for implementing radiation protection standards is one of the most advanced.

The second example of our learning from experience that comes to my mind is the thalidomide tragedy. Thalidomide is an immunomodulatory drug that was developed and widely sold in the western markets in the sixties. Primarily prescribed as a sedative to cure anxiety, insomnia etc., it was also used against nausea and morning sickness in pregnant women. In those years, the use of medications during pregnancy was not strictly controlled, and drugs were not thoroughly tested for potential harm to the fetus. Thousands of pregnant women took the drug to relieve their symptoms. There soon appeared reports of findings of abnormalities in children being born, traced back to the use of the drug thalidomide. It was estimated that the drug led to the death of approximately 2,000 children and serious birth defects in more than 10,000 children. Thalidomide was taken off the market soon after due to massive pressure from the press and public. The thalidomide experience globally led to a more rigorous drug approval procedures.

The introduction, large scale use and ultimate ban of pesticides and insecticides like DDT on grounds of adverse impacts on public health is yet another example of our handling public risks sensibly.

There have also been examples of panic responses to public risks associated with an emerging technology product. Let us take the case of air ships. Considered to be intrinsically safer and less expensive, the development of airships for diverse applications was in the forefront during the early decades of the twentieth century. A few

accidents in the early days of air ship development led to complete denial of this technology for public use. Every time I hear the news of a helicopter crash, it hurts me to think that the air ship could have provided a safer option.

In all the above cases, the domineering role of the government can't be missed. Our experience in the last few decades has also brought out some weaknesses of the Government in managing public risks. It is well known that the government machinery is in general slow and perennially short of funds. It is also highly vulnerable to public sentiments. I will like to draw your attention to two recent instances where public perceptions have played a major role in government policy making- public agitations against the introduction of Bt brinjal and the Indian Neutrino Observatory Project. Both the above were resisted by a section of the public on grounds of unacceptable public risks. Assurances by the government were not considered convincing enough, neither the assurances by the specialists. The Bt brinjal moratorium has resulted in a stalemate depriving the public the benefits of a new technology and controversy on the INO is leading to an erosion of scientific relevance in the global context. There have also been instances of a lack of public response in some cases, perhaps because of inadequate information on the associated risks. I will like to draw your attention to one instance, the Global Climate Change arising out of continued burning of hydrocarbons to satisfy the global energy needs. Emerging technologies like human cloning are not even fully understood in respect of public risks. There is an increasing trend for judiciary to get involved in such matters. I am not sure whether that is the way to go.

What is the way forward? With more and more countries across the world opting for democratic forms of governance, with increasing participation of the public in policy making including Government policies on regulatory matters relating to high and emerging technologies, I do not see any alternative to taking public into confidence and empower them with reliable information. But communicating matters of high and emerging technologies to the public at large is complex and challenging. This is made even more complex in our country with multiple languages and poor literacy including scientific literacy. Often, genuine differences of opinion among experts erode the confidence of the public on the experts. Risk Communication is even more of a challenge. Under- and over-playing risks are counterproductive and do not elicit a calibrated response in times of emergency. Science and Technology professionals have a responsibility to make available reliable information on these matters to the public. Unfortunately, neither S&T communication receives a priority nor these people are effective communicators. The role of professional media persons can't be ignored. In general, grown-ups have a tendency to hang on to known concepts. It is the young that is open to new ideas and new demands. We need to target the young.

**0101012 RAO, RAMANATHA V (Bioersivity International and Co-Founder, GRSV Consulting Services, Bengaluru). UNDERSTANDING BIODIVERSITY, FOR HUMAN & SOCIETAL WELLBEING**

The Earth's ecosystem is made up of both living and non-living components, and their interactions. Plants, animals, and all other living beings interacting with each other (in each area) make up the living component, while the non-living component includes the weather, earth, sun, soil, climate, and atmosphere. The structural components of an ecosystem are the vegetation, water, soil, atmosphere, and biota (plant and animal life of a region, habitat, or period) and their interactions within and across the ecosystem(s). Ecosystem services are the benefits that humans obtain from ecosystems; for example, food and water, medicines, etc., which sustain the conditions for life on Earth. The living component of the ecosystem constitutes its biodiversity, comprising all forms and variety of life on Earth across all the different levels of biological organization.

One can safely assert that without biodiversity, there is no future for humanity, at least as we know it. Human wellbeing includes food, nutrition, and health, along with many other creature comforts. For almost all these necessities, humans are dependent on nature in general, and biodiversity in particular. Take for example, food and medicines: All our food and nearly two-thirds of the drugs approved by the U.S. Food and Drug Administration between 1981 and 2014 derive in one way or another from natural products; other developing countries like India, which have strong/long tradition of plant-based remedies, are even more dependent on biodiversity for their medical needs. It has been estimated that about 40 per cent of prescription medicines come from plant extracts or synthesized plant compounds. For a list of plant-based medicines, go to <https://www.thoughtco.com/drugs-and-medicine-made-from-plants-608413> (accessed on 24/09/2019). Along with indigenous communities, forest dwellers and farmers are our best hope to preserve biodiversity, environmental health, and food security (Sthapit et al 2019).

One major contribution that the social sciences can make about the uncertain human future is to help us explore alternative futures; for example, what would the world be like with depleted biodiversity, or with higher global temperatures than average. In that effort, the social sciences could include, but not be limited to, anthropology, archaeology, communication studies, economics, history, musicology, human geography, jurisprudence, linguistics, political science, psychology, public health, and sociology. However, often biodiversity (and other gifts of nature) get short-changed since only economics is used while valuing it. This leads to a great undervaluation of the importance of biodiversity to human wellbeing as well as future survival. Something as basic as biodiversity need not be measured solely in terms of dollars and rupees. I urge that it is vitally important that this attitude should change, for us to sustain the existing biodiversity into the future; neglecting to take such an integrated perspective is inviting our own downfall.

The importance of biodiversity, especially of the readily useful agricultural biodiversity, and its use for the sustained future of humans, requires wider understanding by the general public; it needs to be routinely turned into actions like diversity of foods and other everyday uses. There is a need for greater understanding by the society as a whole about (i) why we should be concerned about biodiversity conservation, (ii) how the conservation and use of biodiversity at different levels is essential for our survival, and (iii) how such efforts can be balanced with contemporary developmental efforts.

This paper summarizes concepts of the ecosystem, its functions, and services, and focuses on biodiversity, explores its value for humans, and describes the role it plays in the wellbeing of human societies. It also emphasizes the need for conservation efforts.

### Introduction

Biological diversity or biodiversity refers to the amount of diversity within and between living beings and ecosystems in each location at a time. Generally, tropical regions of the earth are richer in biological diversity than temperate regions, deserts, etc. It is estimated that there are up to about 100 million species on the earth, of which humans know only about 1.6 million species (Table 1); however, these estimates tend to vary significantly from author to author. All these estimates confirm one fact: there are many species of living beings about which we know very little. Several of these species are known to be threatened, and IUCN (2019) estimate puts the number such threatened species at 41,415. It is also recognized that several species are already extinct and such extinctions are still happening.

Ecosystem services are the benefits that humans obtain from ecosystems of which biological diversity is a component; for example, food and water, medicines, etc., sustain the conditions for all life on Earth. Hence, the health of biological diversity and resources is essential for the wellbeing of human beings as well as that of wild beings. Sustainable use and conservation of biodiversity become essential for both environmental health and human wellbeing.

Table 1. Estimated number of species on earth (source – Mora et al 2011)

| Species            | Earth (Number of species) |           |           | Ocean (Number of species) |           |         |
|--------------------|---------------------------|-----------|-----------|---------------------------|-----------|---------|
|                    |                           |           |           |                           |           |         |
| <b>Animalia</b>    | 953,434                   | 7,770,000 | 958,000   | 171,082                   | 2,150,000 | 145,000 |
| <b>Chromista</b>   | 13,033                    | 27,500    | 30,500    | 4,859                     | 7,400     | 9,640   |
| <b>Fungi</b>       | 43,271                    | 611,000   | 297,000   | 1,097                     | 5,320     | 11,100  |
| <b>Plantae</b>     | 215,644                   | 298,000   | 8,200     | 8,600                     | 16,600    | 9,130   |
| <b>Protozoa</b>    | 8,118                     | 36,400    | 6,690     | 8,118                     | 36,400    | 6,690   |
| <b>Total</b>       | 1,233,500                 | 8,740,000 | 1,300,000 | 193,756                   | 2,210,000 | 182,000 |
| <b>Archaea</b>     | 502                       | 455       | 160       | 1                         | 1         | 0       |
| <b>Bacteria</b>    | 10,358                    | 9,680     | 3,470     | 652                       | 1,320     | 436     |
| <b>Total</b>       | 10,860                    | 10,100    | 3,630     | 653                       | 1,320     | 436     |
| <b>Grand Total</b> | 1,244,360                 | 8,750,000 | 1,300,000 | 194,409                   | 2,210,000 | 182,000 |



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*Note: Predictions for prokaryotes represent a lower bound because they do not consider undescribed higher taxa. For protozoa, the ocean database was substantially more complete than the database for the entire Earth. So, the authors used only the total number of species in this taxon. All predictions were rounded off to three digits.*

### **Ecosystem Functions and Services**

During the last few decades, there have been numerous discussions and writings about ecosystem functions, especially in the context of environmental health and biodiversity conservation and its sustainable use. Despite diverse perceptions, there is hardly any disagreement that the ecosystem, its functions and services, and biodiversity are important elements in transforming the hunter-gatherer stage of humans to the early domestication of plants and animals, to the current modern-day agriculture, and the need for preserving and using all the three in a sustainable manner is well recognized (Ramanatha Rao 2018a). Ecosystem function consists of the biological, geochemical, and physical processes and components that take place or occur within an ecosystem, e.g. vegetation, water, soil, atmosphere, and biota, and how they interact with each other within an ecosystem and across ecosystems. Ecosystem services are the benefits people obtain from ecosystems, for example, food and water, disease control, etc. The living component of the ecosystem is the biodiversity, comprising the variety of life on Earth across all the different levels of biological organization. On a smaller scale, biodiversity can be used to describe the variation in the genetic makeup of a species; on a larger scale, it can be used to describe the variety of ecosystem types. Scientists, social activists, and the political masters are now recognizing the degradation of ecosystem services and functions and loss of biodiversity that has happened over the years, and that efforts are needed to make them sustainable for future generations (Gleissman 2014).

Ecosystem functions refer to the structural components of an ecosystem and how they interact with each other in different combinations, within and across ecosystems. Much literature can be found on various types of ecosystem functions and services in the literature (e.g., Daily 1997, Tallis et al 2007, Wratten et al. 2013, Kareiva et al. 2011). Ecosystem functions are called ecological processes, usually classified into 4 classes:

1. *Provisioning Functions* relate to the provision of life-supporting natural resources, including raw materials, water, shade and shelter, nutrients and medicines, and genetic resources.
2. *Regulating functions* relate to maintenance of essential ecological processes and life support systems, including regulation of oxygen levels in the atmosphere, water for life to flourish, pollination to promote seed production, soil retention, nutrient regulation, waste decomposition, biological control, etc.
3. *Supporting functions* relate to providing habitat (living spaces) for plant and animal species at local and regional scales; for example, soil formation and nutrient cycling.
4. *Cultural Functions* relate to providing life fulfilment opportunities and logical development, such as landscape opportunities, cultural heritage, and recreation and tourism.

Each ecosystem function can contribute to more than one ecosystem service, and it can take more than one ecosystem function to provide any of the ecosystem services. Organisms build up ecosystems that in turn create a biosphere, consisting of a variety of ecosystems that interact with each other and exchange services like our body does to function effectively (Ruhl et al 2013).

Nature provides ecosystem services on its own. Society at large benefits from several such benefits, which are most often provided free of cost and humans (and other living beings) enjoy the natural functions of the ecosystem (Kareiva et al. 2014). A few examples of ecosystem services are the following:

- Leaf, fruit, and seeds, etc., produced by photosynthetic processes as food,
- Oxygen provided by removing carbon dioxide in the air, via growing plants and trees,
- Provision of timber by trees for house construction, etc.,
- Provision of clean water and fish for human consumption,
- Beneficial insects, such as pollinators, honeybees, parasites, etc., and
- Healthy soils for food production.

In general, ecosystem services are life-supporting nature and are for the survival of humans, animals, and other living organisms. At the same time, human activities have been impacting significantly on ecosystem services and, in some instances, may cause their abuse. For instance, the natural processes of seed distribution are interrupted due to overexploitation and harvesting of too many trees or too many fruits, compromising the life-sustaining function of oxygen supply and carbon sequestration. Hence, understanding the nature of ecosystem services and how these are sustained helps all of us to be alert and to play a part in protecting the ecosystems (Naeem et al. 1999; Ramanatha Rao 2018a).

The science of ecology that deals with various aspects of biodiversity functions and services is relatively new, going back to the 1800s. However, we can see that the roots of ecology lie at the basis of various religions and cultures, for example, Sanatana Dharma or Hinduism that pays much attention to environment and environmental ethics and to understanding the role and value of nature to human society (Kermani 2017). In more recent times, a variety of ethical considerations and approaches to human relationships to biodiversity are described in a report by the United Nations Educational, Scientific and Cultural Organization (UNESCO 2011). Despite the range of ideas that have been included by the authors of the report, most argue that human beings should modify their behaviour to slow the rate of biodiversity loss. Earlier we have seen that ecosystem functions are classified into 4 categories, and now we explore further how the biodiversity component of the ecosystem fits into the scheme of things and helps to maintain ecosystems healthy enough for human societies to survive and prosper (more details can be found in Ramanatha Rao 2018b).

### **Biodiversity**

Biodiversity or biological diversity is the variety of plant and animal life (including microorganisms) in a habitat (or in the world). It is based on a hierarchy/ rank of variation/diversity of plants and animals in the given location and is a 'live' component of the ecosystem. In simple language, it refers to the amount of diversity within and between species and ecosystems in each location at a time. Thus, it is the sum of all the variability among living organisms from all sources, including those on earth, air, and water. Generally, tropical regions (for example, India) are rich in biological diversity and temperate regions, deserts, etc., are less so. As noted in the Introduction above, several species are known to be threatened, or already extinct, due to various natural and human-induced causes. Hence, the conservation of biological diversity and resources is essential for a healthy society and the continuation of humanity (Ramanatha Rao 2018a).

It is generally agreed that the value of biodiversity goes far beyond anything we can describe using economic valuation indices. Ecologists and economists, with or without the involvement of governments, have been struggling with these questions for decades with little success. Establishing the value of biodiversity to economies is important, in part because it will help policymakers in all countries to appreciate that there's a cost to losing nature. But at the same time, an economic assessment must consider the perspectives of the humanities, of developing countries and of members of indigenous communities. Due attention needs to be given to multifunctionality and context specificity (e.g. the value of a variety or product—for a rich, as opposed to poor farmer—a livelihood asset) of a biodiversity entity, which makes the process complex. Some level of obsession with some policymakers for the nature being socially useful to be valued is ethically incorrect. Various tools and conceptual frameworks that have been developed based on the need of commodification of nature, for example, the methods promoted by the United Nations System of Environmental-Economic Accounting in valuation of nature (SEEA 2014) valuation of nature and shows its inadequacy in arriving at a non-commoditised conception of "socially useful nature" (Prasad 2019). Cost-benefit calculations tend to rule out the normative moral arguments for an equitable sharing of future carbon space (and biodiversity) that do not converge with the material interests of states (Jaiswal and Jayaraman 2019), which is again unethical.

It may be possible to develop a system of valuation that is strictly based on attributed values and market price, but I still think such a value would vary enormously with space and time and will have little value. In addition, a narrow perspective bears the risk that people's attitudes and perceptions will transition towards a mere

economic perspective on nature, which could arguably jeopardize long-term biodiversity protection aims (Kaphengst et al. 2014)

Biodiversity is the basis for numerous ecosystem services, for example, air quality, climate, pollination, water purification, and soil formation. The material benefits it offers humankind are also tremendous in terms of its functions in maintaining equilibrium in any given ecosystem, in addition to providing food, fibre, medicines, and other day-to-day needs of humans. Thus, the conservation and optimal use of the available biodiversity becomes imperative. Biodiversity is the foundation of our existence on earth, as it provides us with many benefits. In addition to its utilitarian values, it is also important to conserve biodiversity to satisfy our own curiosity and aesthetic appreciation. Biodiversity is the life support system of not only humans but also of other living beings— for air to breathe, food to eat, and water to drink.

Despite its value and importance, biodiversity is being lost at an alarming rate due to such factors as population growth, deforestation, and habitat loss, overexploitation, invasive species, pollution, and climate change. Among many of these anthropogenic actions, four have been highlighted as main drivers by many authors: (i) land-use change, habitat loss, and fragmentation; (ii) global climate change; (iii) invasive alien species; and (iv) natural resource overexploitation (e.g. over-hunting, over-fishing) (Alkemade et al. 2009). At the same time, it is also known that biodiversity loss is a major driver of ecosystem change (Hooper et al. 2012). It is interesting to note that somewhat similar actions by humans have varied effects on the environment and biodiversity. For example, solar-powered irrigation systems offer a cost-effective and sustainable energy solution to off-grid farmers and thus help in increasing food production and sustaining livelihoods. At the same time, they have been shown to result in serious groundwater depletion (as the power is available almost always) due to overexploitation (Closasa and Rap 2017). If unchecked, the long-term effects could increase the aridity of the area and reduce the flow of water in rivers and streams (de Graaf et al 2019), with consequent effects on surrounding vegetation and animals. Land-use changes can affect the environment and biodiversity; for example, change of land from agriculture to solar parks may reduce biodiversity, but can help in the sustainability of power production and reduction in carbon dioxide, etc. In addition, well planned and carefully laid out solar farms can be beneficial to wildlife and pollinators (Midgley 2019).

### **Effects of Loss of Biodiversity on Ecosystem**

Changes in biodiversity (or the loss of it) cause concern not only for ethical and aesthetic reasons but also due to their capacity to alter the ecosystem properties and the goods and services they provide to humanity. The scientific community has come to a broad consensus on many aspects of the relationship between biodiversity and ecosystem functioning, and some examples are given below (including those found in literature):

1. Species' functional characteristics strongly influence ecosystem properties.
2. Alteration of biota in ecosystems via species invasions and extinctions caused by human activities has altered ecosystem goods and services in many well-documented cases, many of which are irreversible.
3. The effects of species loss or changes in composition and the mechanisms by which the effects manifest can differ among ecosystem properties, ecosystem types, and pathways of potential community change.
4. Some ecosystem properties are initially insensitive to species loss because of multiple species having similar roles or such species have an insignificant role.
5. More species are needed to ensure a stable supply of ecosystem goods and services as spatial and temporal variability increases.

According to Hopper et al. (2012), more research is needed in the following areas:

- Relationships among taxonomic diversity, functional diversity, and community structure,
- A deeper understanding of multiple trophic levels,
- Long-term experiments to assess temporal stability, and assessment of response to and recovery from a variety of disturbances.
- Because biodiversity both responds to and influences ecosystem properties, understanding the feedbacks involved is necessary.

- More work on these lines is needed to understand the intricacies of influence and relationships in the marine ecosystems.

These conclusions do establish that biodiversity loss decreases ecosystem functioning at the local scales at which species interact, but it is not clear as to how biodiversity loss affects ecosystem functioning at a larger scale, which is very relevant to biodiversity conservation and policy (Isbell et al. 2018). Isbell et al. (2018) conclude that species loss can reduce ecosystem functioning both locally and by eliminating species that would otherwise enhance ecosystem functioning across temporally fluctuating and spatially heterogeneous environments.

Governments around the world recognized this at the Earth summit in Brazil in 1992 and established the Convention on Biological Diversity (CBD 1992) to protect and conserve biodiversity. But the situation has become more and direr. The continued loss of biodiversity is not only an environmental issue as the largest driver of biodiversity loss on land in recent decades has been land-use change, primarily the conversion of pristine native habitats into agricultural systems to feed the world, while oceans are over-fished. The climate crisis and the loss of biodiversity are issues that affect each other. Loss of biodiversity can adversely affect climate: deforestation increases the atmospheric abundance of carbon dioxide, for example, which is a greenhouse gas. It has been well recognized that human land use threatens global biodiversity and compromises multiple ecosystem functions critical to food production. Whether crop yield-related ecosystem services can be maintained by a few dominant species or rely on high richness remains unclear. Recently a global synthesize study carried out by Dianese et al indicates that maintaining the biodiversity of ecosystem service providers is therefore vital to sustaining the flow of key agroecosystem benefits to society. (Dainese et al 2019)

Most attention, which is very limited by any measure, on biodiversity tends to focus on saving large charismatic animals, rather than informing the public of the importance of biodiversity to human societies and wellbeing. Business as usual and scenarios that focus on economic growth and regional competition will lead to continued loss of biodiversity. Sustainable consumption practices can slow, but not eliminate, future loss of biodiversity, in part because warming will continue in all scenarios (Watson 2019).

### **Biodiversity and Economic Development**

Almost in all countries, plans for economic development overlook ecosystems and biodiversity; it has been asserted many times that development and conservation are mutually exclusive. However, increasingly, leaders in academia and finance, and experts in sustainable development and the private sector agree that nature is a key engine of economic prosperity. There are now efforts to search for ways and means, as well as tools and technologies, to balance these two. For example, Gretchen Daily and Lisa Mandle of Stanford's Natural Capital Project are looking for tools for improving the well-being of people and nature at the same time. This involves implementing approaches that reduce poverty and increase access to education, health care, and infrastructure, while investing in the natural assets on which our livelihoods, health, and economies depend—our natural capital (Cafasso 2019). The question of whether conservation and human development can go hand in hand is being researched by many institutions. Preliminary results of such studies indicate that conserving nature while providing water, food, and energy for a growing human population is possible, this would require fast action (Tallis and Polasky 2019). An increase in population is leading to a scramble for resources, as well as the development of new technologies and socio-economic and political structures to help organize a rapidly expanding society (Sood 2019), causing severe environmental damage and biodiversity loss. There thus an urgent need for us to alter how we perceive ourselves, each other, and the environment. We need to promote radical transformations in the method and scale of efforts, and in the global political economy; there is no time to waste.

### **Agricultural biodiversity**

Although there is no formal definition of agricultural biodiversity, generally we use what is agreed by the parties to the CBD (Convention on Biological Diversity 2005). It includes all components of biological diversity of relevance to food and agriculture (or economically useful to humans) and all components of biological diversity that constitute the agricultural ecosystems, also named agro-ecosystems, i.e., the variety and variability of animals,

plants, and micro-organisms at the genetic, species, and ecosystem levels. Thus, agrobiodiversity includes all those living beings which are necessary to sustain key functions of the agroecosystem, its structure, and processes; in other words, all those elements that sustain and nurture human societies. Agricultural biodiversity is a vital component of human wellbeing, as the services it provides include all the agricultural products needed by us in everyday life—for food, feed, fodder, fibre, health, habitation, etc. Hence, it is needless to highlight the importance of agricultural biodiversity in our lives, and it becomes imperative that we should be concerned about its status.

Some of the existing measures of biodiversity conservation, including agricultural biodiversity, include the following: biosphere/forest preservers, zoological/botanic gardens, national parks, genebanks and adoption of breeding techniques, tissue culture techniques, social forestry to minimize stress on the exploitation of forest resources (Ramanatha Rao and Hodgkin 2002; Rawat and Agarwal 2015). One end of the biodiversity conservation spectrum is that the plant genetic resources are irreplaceable, and it is essential that we should be concerned with their conservation, at the species level, gene pool level, or at the ecosystem level. Genetic diversity is a natural defence mechanism against the genetic vulnerability, which has been built into the genetic structure of traditional cultivars or landraces. Countries that still have a significant amount of genetic diversity and species diversity have a responsibility unto themselves as well as to the world at large to conserve it and make it available to for use (NRC 1972 Brown 1983; Ramanatha Rao 2012).

**Value of Biodiversity** Policymakers and the general public in many countries have responded to concerns over declining levels of biodiversity in general and agricultural biodiversity specifically. Such efforts nationally and internationally have led to the introduction of a range of policy measures at the national level and conventions (or agreements) at the international level. The individual components of biodiversity—genes, species, and ecosystems—provide society with a wide array of goods and services (McNeely et al. 1990; Reid and Miller 1989). The value to human society could emanate from either the biodiversity in domesticated systems or the biodiversity in wild landscapes. The variety of services provided by biodiversity from both those systems to humankind, as described earlier, are often taken for granted. Try to imagine what life would be without one or more of these services. For example, services such as maintenance of gaseous composition in the atmosphere, pollination, formation of soil, nutrient cycling, climate control by forests and oceanic systems have been valued at 16 to 54 trillion ( $10^{12}$ ) US dollars per year. There are a host of other services, and how does one put a value on colourful butterflies hovering above?

Let us look at Biological diversity in the context of social sciences, which helps to explore alternative futures; for example, what would the world be like with depleted biodiversity, or with higher global temperatures than average. In any such effort, the social sciences could include, but not be limited to, anthropology, archaeology, communication studies, economics, history, musicology, human geography, jurisprudence, linguistics, political science, psychology, public health, and sociology. One could link biodiversity (and other gifts of nature) with most of these if not all branches of social sciences. Nevertheless, biodiversity gets short-changed, since only economics is used while valuing it. This leads to a great undervaluation of the importance of biodiversity to human wellbeing as well as future survival. Something as basic as biodiversity need not be measured solely in terms of dollars and rupees. I urge that it is vitally important that this attitude should change, for us to sustain the existing biodiversity into the future; neglecting to take such an integrated perspective is inviting our own downfall. Thus, I believe, putting a value on biodiversity, and questioning the costs of conservation measures to be taken, may help in convincing doubting policymakers, but it is not an essential task. Estimating the costs for measures that promote conservation is relatively easy; however, it is much more difficult to estimate the benefits. Econometrics alone cannot help guide the design of biodiversity policy by eliciting public perceptions and preferences on different attributes of biodiversity. In addition, it can be complicated by the generally low level of awareness and understanding of what biodiversity means on the part of the public. Since many of the estimates will be/are based on highly theoretical concepts, assumptions, and perceptions, it is important to treat them as guidelines and not as standards (Rajeswari and Dey 2016).

I belong to the group that questions the need for the valuation of such life-sustaining natural resources purely in economic terms, which runs the risk of undervaluing the immense social and cultural benefits provided by agricultural biodiversity (Ramanatha Rao 2012). For me, measuring everything in terms of economic

returns/economic viability and the obsession with, for example, gross domestic product (GDP) only reflects human greed. At the same time, I do not advocate binge spending as well. Whatever we do to conserve biodiversity should be based on a full understating of its use for the current and future wellbeing of human society and planet earth.

### Conservation and Use

The main driving force for the conservation of biodiversity is its value for the present and future of the humans and other beings of the earth. Thus, either now or in the future, all conservation efforts that we make and the methods and approaches that we use should ultimately focus on promoting the use of conserved resources, be it from the protected areas, biosphere reserves, genebanks, experimental fields, farmers' fields, or plantations. Since the 1970s, global as well as national efforts on conservation and use of biodiversity have made significant progress. Some national governments are considering making Biodiversity Net Gain (BNG) mandatory. BNG is both an approach and an outcome. It involves not only avoiding or mitigating harm to natural areas but also seeking to improve them through the creation or enhancement of habitats over and above what is there already. This will require a baseline assessment of existing habitats on a given site and evidence to demonstrate that a net gain has been achieved (BBOP 2018). At COP-14 of CBD, the "Sharm El-Sheikh to Kunming Action Agenda for Nature and People" was launched. It explicitly asks countries to do as follows: (1). Raise public awareness about the urgent need to halt biodiversity loss and to restore biodiversity health; (2). Inspire and help implement nature-based solutions to meet key global challenges; and (3). Catalyse cooperative initiatives across sectors and stakeholders in support of the global biodiversity goals (CBD 2019)

Agricultural biodiversity is of direct concern to humans as it plays a role in almost all spheres of human activity, starting with food and nutrition. Both at the national level and at the global level, agriculture continues to face five major challenges: ensuring food and nutrition security; livelihood security; achieving sustainable production and productivity of food and commodity crops; combating diminishing non-renewable resources, including land and water; and meeting the demands placed by global changes such as migration, urbanization, and climate change and their impact on agriculture and the environment. A well-coordinated work on making agricultural biodiversity easily accessible and refocusing on integrating traditional knowledge with modern knowledge and methods can help us to continue to make progress in using agricultural biodiversity in facing those challenges. It will also require supporting on the ground action and conservation by communities. Community restoration groups, seed savers, backyard trappers, coastal and marine protection advocates, and forest protection movements can bring a paradigm shift on biodiversity management (Sthapit et al 2016). There are over 300 million indigenous people in the world and most of them are directly dependent on the natural resources for their livelihoods. Hence it is a strategic imperative that indigenous peoples are involved in the maintenance and conservation of the world's biodiversity (Toledo 2001). Relatively greater number of researchers now believe that indigenous knowledge can help solve the biodiversity crisis and that people who live off the land depend on keeping ecosystems intact, and scientists are tapping into their unique expertise (Rundle 2019)

Some essential features that our efforts to conserve biodiversity should include are as follows (Shanker et al 2005; Sthapit et al. 2019):

- generate knowledge on biodiversity in all its three states, i.e., genetic diversity, species diversity, and ecosystem diversity and ways and means to manage these;
- understand the context and develop the team;
- provide the soundest scientific information to policymakers and enhance public awareness;
- promote stakeholder participation from the planning stage and emphasize multidisciplinary, multi-institutional, and multisectoral collaboration;
- develop management systems and process documentation systems that emphasize decentralization, fairness, and equity in the use of resources by civil society and promotion of public and private sector collaboration;
- disseminate information for conservation and sustainable use of biodiversity; and

- develop and implement focused training programmes to foster a new generation of researchers and leaders to meet current challenges in biodiversity conservation and environmental protection.

### **Biodiversity and Climate Crisis**

Climate change is the most pressing concern faced by humanity. Ecosystems and the biodiversity and services they support are intrinsically dependent on climate. There have been many speculations about impacts of climate change on biodiversity, ecosystems, and ecosystem services (Staudinger et al 2012), all which have a direct bearing on humankind. Many studies report that biodiversity and ecosystems are significantly stressed. Climate change is causing many species to shift their geographical ranges, distributions, and phenologies at faster rates than previously thought (Peterson et al 2019) and such changes alter ecosystem structure and functioning. There is growing evidence that populations of certain species are declining and of localized extinction that can be directly attributed to climate change (Razgoura et al 2019). Overall, it is predicted that there could be a net loss of global biodiversity and major shifts in the provision of ecosystem services. For example, the range and abundance of economically important marine fish are already changing, and some fisheries may become more valuable if the fishing community can adapt.

In spite of numerous publications, documentaries, and workshops and meeting proceedings, climate change remains an abstract and uncertain concept to most people. Ironically, the story of climate change is, in fact, a deeply human one—we caused it, we will suffer from it and we alone can take action to avoid its worst consequences and prepare for the rest (Markowitz and Corner 2019). In many peoples' minds, it is still primarily an "environmental" issue. It has been reported that that human activity is driving one million plant and animal species to extinction (IPBES 2019). From an extreme point of view, it is probably not just any human action; it is the choices of a tiny minority of wealthy and powerful people (Noor 2019). There is the urgent need to move the issue of climate change, and the resulting loss of biodiversity, from a scientific reality to social, economic, and political reality. This needs to become a people's movement. A group of UN experts has warned that the erosion of nature, the extinction of species, and the loss of biological diversity at unprecedented rates severely threatens human rights for present and future generations (UN 2019).

The world is already witnessing changes in precipitation regimes and extreme events that can cause ecosystem transitions, changes in transport of nutrients and pollutants (including pesticides) downstream ecosystems, impacting the capacity of nature to changes (Arnell 2019). Longer growing seasons and warmer winters are enhancing pest outbreaks, leading to tree mortality and more intense and extensive fires. One can find many more examples in literature. Climate adaptation has experienced a dramatic increase in attention recently, and more emphasis is being placed on biodiversity conservation and natural resource management. However, more multidisciplinary, multi-institutional, and multisectoral (3M Approach) research and management approaches are essential in areas such as monitoring, experimentation, and a capacity to evaluate and modify management actions. The 3M Approach is essential as ecosystem functions and the value of biodiversity (for example, energy, agriculture, transportation, etc.) are interrelated and interdependent, and they cannot be tackled in isolation. Risk-based framing (Gentle and Marasen 2012; Shukla et al 2019) and stakeholder-driven scenario planning (Thomas et al 2019) are to improve our ability to manage the crisis resulting from climate change.

There are many who argue that regenerating the planet through biodiversity-based ecological processes has become a survival imperative for the human species and all beings. Such a transition can only happen only when a shift from fossil fuels and dead carbon to living processes based on growing and recycling living carbon, renewed and grown as biodiversity, occurs (Shiva 2019, Lal et al 2012). At the same time, there is a large group of researchers and intellectuals who are cautiously optimistic. Most understand that they can't afford as a global society to ignore nearly universal scientific observation of anomalous climate trends and degraded nature patterns, and we also cannot tone down the severity, scale, and systemic nature of the current biosphere reality (Cunningham 2019). However, we cannot just wish for a positive future but need a strategy that includes a conscious reduction in our wants and desires. Even scraggy wild areas are now shown to contribute significantly to the survival of species (Di Marco et al. 2019).

### Biodiversity and Social Sciences

Social sciences can contribute to the human ability to tackle our uncertain future by helping us to explore alternative futures; for example, what would the world be like with depleted biodiversity, or with higher global temperatures than average. They can help us to explore biological (genetic diversity, species diversity, ecosystem diversity, landscapes and seascapes), and cultural diversity (diversity of languages, livelihoods, values, knowledge systems, social and political systems, beliefs, spirituality and worldviews), as well as their interactions and evolution. Both those components are facing unprecedented change and, in some cases, erosion, which need to be studied and used to identify alternative scenarios.

UNESCO seeks to develop innovative approaches (UNESCO 2019), as follows:

1. to promote understanding of the linkages between biodiversity and cultural diversity;
2. to raise awareness of the essential role of cultural diversity in sustaining and creating biological diversity;
3. to support the meaningful inclusion of local and indigenous knowledge in biodiversity conservation and management;
4. to mobilize cultural diversity to counter biodiversity loss; and
5. to address ethical dimensions of biodiversity

The IPBES expects the role of social sciences in its work could be three-fold (Vadrot 2018):

1. Identification and understanding of social and human-related drivers of biodiversity loss.
2. Understanding of politics and policies for biodiversity conservation and use— concerns the political frameworks and the range of instruments specifically established to tackle the loss of biodiversity at different policy levels and scales.
3. How to enhance the uptake of scientific knowledge in nature conservation policy and improve “science-policy interfaces” for biodiversity and to describe the means by which they could contribute to tackling the perceived lack of scientific advice and consensus in international biodiversity.

Society shapes our relationships with the living world, and ethics can help us to better understand and, as appropriate, re-orient these relationships. Some of the ethical questions related to biodiversity include the role of humans in its conservation, sustainable use, and benefit-sharing.

### Conclusions

The ecosystem, its functions and services are highly interrelated, and the ecosystem impacts the biodiversity that it contains and, in turn, is influenced by that biodiversity. Research to date shows that the ecosystems that are home to several species are generally more productive, efficient, and healthy, compared to those with fewer species. Ecosystem functions, services, and biodiversity are interrelated and interdependent. Nevertheless, there are some serious gaps in information, for example, how biodiversity affects the wide variety of ecological functions and how this leads to improved services. This would require more studies and a deeper understanding of ecosystems and biodiversity. Global conventions and national laws and regulations go only thus far. There is the need to combine usable traditional knowledge with modern knowledge and come out with workable solutions. Of course, serious gaps are there and new ways to fund the efforts are to be explored and implemented (Droste et al 2019)

The Speaker has described, in some detail, the importance of biodiversity for human survival and wellbeing, and what society could do in conserving it efficiently and using it sustainably. I have suggested that we need to be responsible so that we do not live on the inheritance of future generations. To do so, there is a need for us to be aware of the significance of ecosystem functions and the importance of biodiversity, so that we, individually or collectively as a society, can contribute to its conservation, and in arresting environmental degradation. Governments, the private sector, and civil society must work together to address the human-induced climate change and biodiversity loss. As individuals, we can make it a habit to promote biodiversity, by being more aware of its importance, by increasing the diversity of our daily diet, by buying biodiverse products, and by participating in environmental and biodiversity-related activities that are carried out at the community level. As Watson (2019) says,



incremental changes will not suffice. Stronger will (at individual, societal, and political levels) is needed, and maybe we should stop pretending that we care about the environment and biodiversity and focus more on preserving human societies, which would require a functioning environment and flourishing biodiversity.

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**0122013 SHETTY, S. CHANDRASHEKAR (Adichunchanagiri University, Nagamangala Taluk, Mandya B.G. Nagara, Karnataka-571448). CURRENT RESEARCH AND THEORY IN MEDICAL AND HEALTH**

The Indian Research Contribution was meagre when compared to global contribution. It was Sleeping Elephant” in earlier days, across all the disciplines. Within Asia, India ranked in third position on productivity of scholarly communications after China at second and Japan at fourth place whereas, it occupies fourth place in terms of citations, after Japan (#4), China (#7) and South Korea (14). When assessed as impact/citation relative to the world, our cites per paper is low in all Medical subjects. India couldn't achieve better than 36% impact in any one of the medical subjects.

### **Research in Medical Colleges in India:**

Such a big medical manpower spread across the country contributes very little for research activity. One of the research papers cites that top 6 colleges published more than 56% of total research papers since 1990. William Osler said “Wards are greatest of Research Laboratories”. The Physician Scientist is an extremely rare species in India. The task ahead in Medical Research and Medical Education in India will be to create a new generation of Clinical Researchers who will taste the excitement of Science. They will place Biomedical Research in India centrally at the confluence of Science, Engineering and Medicine.

### **Health Care and Medical Research:**

Most of our high end diagnostic and therapeutic medical equipment are imported, but an outstanding exception is the Cobalt -60 radiation therapy unit BHABHATRON, designed by the Bhabha Atomic Research Centre, Mumbai. If India were to become a Knowledge Economy, we must have a judicious mix of Basic Research, Applied Research, Technology Development, Innovation and Manufacturing Skills. Indigenisation of high-technology hardware and software products is essential. Approximately, 3200 types of medical devices available globally, but, India manufactures only around 100.

ICMR has made outstanding contribution as a knowledge generating agency and contributed in understanding various diseases of national importance such as malaria, Japanese Encephalitis, Tuberculosis, AIDS, Kala-azar, Filariasis, Leprosy and Poliomyelitis, Additionally, ICMR has made extensive contributions in the areas of nutrition, reproduction and maternal and child health, occupational and environmental health and research complementing health systems.

Breakthrough in Genomics and Proteomics research has brought an opportunity to change the way medicine is practiced today. The genomic and proteomic data permit design of tests for early, accurate diagnosis and thus help physicians in optimal management of diseases. In addition, information on susceptibility/predisposition and predictable drug response would ultimately lead to personalized medicine.

The long term goal is also to develop treatment approaches based on the science of regenerative medicine and Nano medicine leading to an improved quality of life by reducing morbidity.

### **0101014 SHETTY, S. V. R (GRSV Consultants, 232, Hollywood Town, Sadahalli, Bangalore-562102). RAINFED AGRICULTURE: RESOURCE BASE, TECHNOLOGIES AND SOCIETAL IMPERATIVES**

Globally, rainfed agriculture covers about 40 percent of the world's land area spreading across 55 countries where more than 2.5 billion people live and depend on agriculture for their livelihoods. In India, about 70% cultivated land supporting about 40 percent of India's population and contributing to about 45% of the India's food basket is rainfed. Unlike irrigated areas, where green revolution ushered significant gains in agricultural productivity, rainfed regions continue to suffer from low productivity (< 1ton/ha) due to uncertain rainfall, frequent droughts, degraded land and other fragile natural resource base. People living in these areas are poorest of poor where large proportion of children – about 42% are malnourished. Increasing climate change and climate variability pose new problems in the form of changes in rain fall and temperature patterns coupled with more extreme weather events.

In India, significant advances have been made by various research and development organizations including state agricultural universities, national (CRIDA) and international (ICRISAT) research and development programs to improve rainfed agricultural productivity and conservation of natural resources. Adoption of various improved technology options resulting in increased yield potential of up to 250-300% on large pilot/operational scale areas has been recorded. This paper highlights examples of some component technologies including improved soil and crop management, rain water harvesting and use through watershed management, ground water recharge,

soil health and integrated nutrient management, crop diversification and cropping systems, alternative land use systems, farm mechanization, agro-forestry and integrated farming systems.

As rainfed agriculture is mainly practiced under fragile resource base, special emphasis is placed on achieving optimum complementarity between natural resources conservation and productivity. The paper highlights technological options for increasing productivity and sustainability of physical resources: primarily land and water to maximize the synergies of crop, livestock, tree and forage components of rainfed farming systems. Component technologies for land and water management aiming at optimising land, water and nutrient use efficiency are described. Examples of location specific technologies for rain water management and arresting soil degradation are narrated. Appropriate policies to remove stagnation of rainfed agriculture and manage frequently occurring droughts through substantial capital inputs for building infrastructure and development of land and water to enhance resilience and livelihood security are also indicated.

Evolution of and lessons learned from innovative integrated watershed management approach to raise agricultural productivity, conserve natural resources and reduce poverty in the stressed ecosystems of rainfed areas are highlighted. Individual farmer and community/village-based activities and much needed supporting public policies and institutions are also indicated drawing from recent watershed management projects in India. The importance of effective community participation and appropriate public policy initiatives are elaborated for the successful implementation of watershed management programs. The critical areas effecting the success of watersheds such as adoption of technologies, collective action and participation by communities, cost sharing, distribution of gains (equity) and up-stream and down- stream trade-offs are indicated.

The paper concludes by recommending a holistic systems perspective to address such critical elements as income generation, diversification and building resilience to enhance sustainability and productivity in rainfed systems. An integrated strategy encompassing modern science, public policy and effective public-private partnerships for sustainable intensification and value-chain development is suggested.

### **Introduction**

The tropical semi-arid regions or dry lands cover about 40% of the world land area spreading over 55 countries with about one third of global population living in these areas. More than one third of these people (about one billion) depend primarily on agriculture. The agriculture here is mainly dependent on rainfall with uncertainty and instability in its precipitation patterns. The mean annual temperature in these areas exceeds 18 degrees centigrade with the rainfall exceeding potential evapo-transpiration for 2 to 7 months. These areas are characterized by fragile resource base coupled with high climatic water demand and by variable and erratic rainfall.

The rainfed farming areas in Asia and Sub-Saharan Africa are the home for about 2 billion people with about 600 million considered to be poorest of poor. Poverty, food insecurity, environmental degradation with frequent droughts is widespread in these areas. About 42 percent of children in rainfed areas of Asia and 30 percent of children in Sub- Saharan Africa are malnourished (Walker, 2010). Rapidly growing population, high urbanization, highest unemployment rate for rural youth and breakdown in social systems further aggravate the challenges facing population dependent on mainly subsistence farming in these areas. Access to water in these areas become even scarcer due to global climate change with more variability and occurrences of short period of extreme stresses (drought and heat) during the crop growing season.

This paper provides an overview of characteristics with special references to resource base and major challenges of rainfed agriculture in India along with presently available technological options to address some of those challenges. The paper also highlights some key elements of alternative approaches for holistic development of rainfed farming areas with a special emphasis on addressing contemporary challenges in natural resources management facing rainfed farming community in India. An alternative strategy to link farmers to markets through market-oriented agriculture development and risk aversion policies with effective public-private partnerships are also described. The paper concludes with suggestions on the way forward to address the sustainable development goals of ending hunger and poverty and sustaining environmental health in the rainfed areas.

### **Rainfed agriculture in India**

In India about 70 percent cultivated lands- contributing 42 percent of the total food production- is rainfed. Rainfed agriculture also accounts for nearly 75 percent of oil seeds, 90 percent of pulses, 70 percent of cotton and supports two-thirds of livestock population. Even after full development of water resources, about 55 percent of the land will continue to be dependent on rains and produce substantial fraction of coarse grains, pulses, oil seeds, cotton, jute etc. The crop production in the rainfed areas in proportion to total production in India is about 30 to 40 percent of wheat and rice, 60 to 70 percent for maize, ragi and cotton, 80 percent of sorghum and millet, 90 percent of oil seeds and pulses, and 100 percent of small millets (CRIDA, 2015). Therefore, the only way to meet the requirements of not only the coarse grains but also to address the shortages of protein, edible oil and cotton is to improve the productivity of these crops in the rainfed areas of the country.

#### Features of rainfed production systems: Fragile resource base

Rainfed farming areas are characterized by a wide range of climatic, soil, vegetative, and farming conditions and it supports several types of farming systems. These characteristics pose severe constraints to sustainable production within the region.

Rainfall is the principal determinant of the cropping potential. Based on average annual rainfall, the country can be divided into arid (less than 500mm), semi-arid (500 to 750 mm) and sub humid (750 to 1150 mm) area. The rainfed cropping area is equally distributed in these three zones. Nearly, 80 percent of rainfall is received from June to September. The main features of rainfall are:

- Extreme variability of rainfall within seasons and between years with the coefficient of variation increasing with decreasing average rainfall
- The beginning and end points of the rainy season are highly variable leading to unstable production potential
- Rains are generally more intense; a relatively high proportion is lost as run-off
- High temperature leading to high water consumptive demand
- The growing season varies from 60 to 250 days depending upon total rainfall, its distribution, potential evapotranspiration and soil water storage. Uncertainties associated with rainfall events render farming highly risk prone

The soils are also diverse and varied. Vertisols (black soils) covering about 25 percent area have high clay content with high water holding capacity, but are highly erodible and produce large amounts of runoff. These soils are also low in nitrogen and phosphorous. Alfisols (red soils) cover about 20 percent of area. These soils are low in clay and organic matter content and with poor nutrient status and have low water retention capacity due to shallow depths. They are also prone to erosion and crusting and produce large volumes of runoff. Arid (sandy) soils are found in low rainfall and desert margins. They are characterized by very low clay content, low water retention and poor soil fertility. Prospects of increased crop productivity are relatively low in this region. Sub-montane and alluvial soils are also found in some rainfed areas. These soils are of variable texture, generally deficient in nitrogen and phosphorous and prone to erosion depending upon the topography.

While, low soil moisture availability commonly restricts crop yields, there are several other soil related characteristics which also affect crop production. They include surface soil crusting, compaction by tillage, low fertility and organic matter, restricted rooting depths, poor drainage and salinization. Soil degradation is also a serious problem in the rainfed areas. It is caused by a strong interaction between biophysical and socioeconomic factors, including increased rate of population growth, fragile economies, poorly designed farm policies. (Lal and Stewart, 1992) Soil degradation can be subtle and slow until a certain threshold is reached, where upon degradation occurs quickly and sometimes irreversibly if the spiral of poor land use continues.

The farming systems in rainfed areas are characterized by mixed farming systems where more than one crop is grown on the same piece of land ( as sole, inter or sequential cropping), and in combination of trees and animals. These diverse systems provide food security under harsh climatic conditions, but are primarily subsistence or semi-commercial in nature. They are also extensive, based on the low use of commercial inputs and are primarily labour-intensive. The principal crops grown are cereals (sorghum, maize, and millets), pulses (chickpea and pigeonpea) oilseeds and cotton. Majority of the holdings are smaller than 2 ha, and these small holdings are comprised of fragmented parcels.

In summary, the productivity of rainfed agriculture is not only low but also fluctuates from year to year due to poor bio-physical and socio-economic resource base. Besides having erratic rainfall these areas quite often are heavily eroded and have very shallow soils. The rainfed regions are characterized by intense rainfall interspersed with drought, short rainy seasons, low soil organic matter content, poor natural soil productivity, and at times low infiltration capacities of soils, severe runoff and erosion hazard, small and fragmented farms, limited capital resources of the farmers, and animal and human labour as primary draft power sources. In the past, the rainfed farmers had variety of options to stabilize their income from farming such as fallowing parts of the farm to maintain soil productivity, and the availability of common property resources for cattle grazing. Many of those options are no longer available to farmers because of increased population pressure. Also, “green revolution” technologies prevalent in large farm irrigated areas are not directly applicable to the high risk prone small holder rainfed farming situations.

### **Technological options for productivity and sustainability of agriculture**

There exists a large body of research knowledge for sustainable management of rainfed farming. These technological advances are published in a wide variety of books and technical journals. A summary of these technology components is presented below:

#### Historical research

Efforts to improve the crop production on the dry lands were initiated as early as 1933 by the then Imperial Council of Agricultural research when it sponsored five dry-farming research centres located at Rohtak, Sholapur, Bijapur, Raichur and Hagari ( Randhawa and Venkateswaralu, 1979). The recommendations from these centres ( known as Bombay, Hyderabad and Madras dry farming practices) emphasized bunding to conserve soil and water, use of manure to supply nutrients, deep ploughing every third year, shallow tillage and inter row cultivation, low seeding and wide row spacing of crops. However, these improved practices resulted in only 15 to 20% increase in yields above the low base yields of 300 to 400 kg/ha which did not enthuse the farmers for adoption. Labour and cash costs and risk involved were too high for the farmers.

In the mid-1950s, a fresh effort was initiated with the establishment of eight soil conservation research, demonstration and training centres. Research emphasis was placed on soil and water conservation to increase and stabilize crop yields through contour and graded bunding, bench terracing and strip cropping. However, the solution to the problem of low crop productivity continued to be elusive as the available crop varieties, being long duration with limited yield potential, did not match the prevailing rainfall pattern and available water supplies in most cases. This and inadequate attention to in situ moisture conservation remained a serious constraint to increasing crop production in rainfed areas.

With the rapid expansion of Indian agricultural research system in the 1960s (through ICAR) plant breeding efforts provided new short duration genotypes of sorghum, pearl millet and cotton which matched the short growing season, thus reducing the risk factor and resulting in higher yield potential. With needed refinement in agronomy, these hybrids/varieties (CSH sorghums, HB pearl millets and FRS cottons) gave large yield increases under rainfed conditions. Availability of this much needed biological component of short duration, input responsive crop plants provided the breakthrough in crop production in rainfed areas.

#### Recent research and development efforts

Encouraged by the potential of achieving increased production and recognizing the need for multidisciplinary research approach, an All India Coordinated Research Project for Dry land agriculture (AICRPDA) was formally launched in 1970 at 23 centres spread across the country representing different agro climatic regions. The principal mandate of these centres was to develop relevant location specific technologies to solve production problems. At the same time international interest in rainfed farming also increased, which led to the establishment of the International Crops Research institute for the Semi-arid tropics (ICRISAT) at Hyderabad. Realizing the enormity and complexity of Indian rainfed agriculture AICRPDA was later strengthened by establishing a national centre (CRIDA) focusing on basic and strategic research to improve rainfed agriculture in 1985. Some of the key research findings and significant achievements emanating from these research efforts are highlighted below (Ref: CRIDA and ICRISAT reports, vision and strategies):

**Resource characterization:** From available soil and climatic data, rainfall probabilities including onset and recession of monsoons, dry spells etc have been worked out. Periods of water availability have been identified considering rain fall probabilities, potential evaporation and soil water capacity. Potential length of growing period for all the major production systems in the country is now known so that appropriate cropping systems can be developed for these locations. District level advisory services and contingency plans to cope with droughts were also provided. Mapping areas for rain water harvesting and standardization of farm pond technology was completed.

**Crops and varieties:** High yielding, stress tolerant crop varieties were developed to match the growing seasons with limited water availability. For example, ICRISAT has released about 700 improved cultivars along with its partner institutions for use by small farmers in Asia and Africa. These include high yielding hybrids and varieties of cereals, pulses, and oilseeds and the area under these improved varieties have increased rapidly in India. Large number of genetic resources (about 119, 000 by ICRISAT) of the major rainfed crops have been collected, conserved and disseminated.

**Cropping systems:** Crop management technologies for various cropping systems including, sole, inter, sequential cropping have been devised to increase productivity of various rainfed agriculture regions. These include dates of planting and harvesting, weeding and inter cultivation and integrated nutrient and pest management technologies.

**In situ moisture conservation:** various soil moisture conservation technologies including types of conservation tillage methods, ground cover management, bench terracing, runoff water harvesting in small catchments were devised.

**Soil fertility management:** Recommendations on fertilizers, biological nitrogen fixation, and use of organic manures such as animal and municipal waste were developed to manage soil health.

**Improved natural resource management:** Techniques to mitigate soil degradation, water and wind erosion management using either preventive measures (such as mulch farming, conservation tillage, vegetative hedges and strip cropping) or through control measures (such as contour bunds or other engineering structures) were evolved.

**Farm tools and implements:** To ensure labour and time saving several implements for timely agricultural operations such as planters, intercultural implements, pesticide applicators, portable pump sets for lifting water from farm ponds have been developed.

**Forewarning systems:** for weather/drought and pests for different crops/systems developed

**Alternative land use systems:** involving crops, agri-sylvi, sylvi-pastoral, agri-horti systems were designed, tested and recommended for various agro-ecological locations.

**Different models:** for enhancing livelihood security in rural areas were developed.



Natural resources management through Watershed based research and development:

A significant milestone in rainfed agricultural research was the setting up of watershed based approach to resource conservation and enhancing agricultural productivity. Watershed based approach to dry land resource management was initiated during the 1970s (Kampen et al 1979) with a natural agricultural watershed as a unit for rain water and soil management in dry areas. The approach also provided an opportunity to evaluate the component technologies alone and in combination to document the synergistic effects of resource conservation and crop management technologies on an operational scale (Shetty and Krantz, 1980). Management of large tracts of deep vertisols with watershed-based component technologies was indeed considered as a major success story. During later years a large number of development projects also followed this approach to test and transfer the technologies under farmer/communities' conditions and gained experience of watershed-based development of rainfed agriculture. Watershed management approach has now become a focus and framework for development in the rainfed areas. A brief synthesis of the experience from about three decades of watershed-based research and development is given below:

Watershed based research and development programme has a long history and has evolved through many years of learning by doing in the rainfed areas with more emphasis on integrating soil and crop management technologies on an operational scale. The three ministries implementing watershed programs: Agriculture, Rural development, and Environment and forests have been investing millions of dollars in rainfed areas mainly to manage natural resource base in dry lands and the programmes have been receiving widespread commitment by the Government and stake holders.

In the pilot areas the impact of watershed-based management is widely recognized. For example, in the Adarsha/Kothapally watershed in A.P, after four years the average yields of crops increased 2 to 4 times, family incomes doubled, ground water availability enhanced, cropping intensity increased with a shift from low to high value crops, significant reduction in soil loss (10 t/ha to 2 t/ha), reduced run off (30-40%), improved water quality and increased green cover leading to greater carbon sequestration (Wani, et al 2002).

An analysis of about 310 watersheds by Joshi et al (2004) revealed mean cost-benefit ratio of 2.14, and internal rate of return at 22% which was comparable with many rural development programs. Increased employment opportunities, augmented irrigated area and cropping intensity and conserved soil and water resources were also recorded. The study also concluded that the performance was better in the regions of 700 to 1000 mm rainfall, jointly implemented by state and central governments, targeted to low and medium-income regions, and with effective community participation. The sustainability of these impacts however was not clear.

While there are visible gains from various watershed development programs, the sustainability of investments made by different agencies has not been ensured mainly because insufficient participation by local communities. The first-generation watershed programmes suffered from a top-down approach and technical focus on only soil and water conservation without sufficient benefits to rural poor.

With the second generation programmes combining technical strengths of earlier programmes with lessons learnt from community participation the effectiveness of watershed programmes were enhanced. Even after the new policies have been issued, several critical areas continued to affect the success of participatory community watershed management in the country. These are mainly related to profitability of interventions, problems of collective action and active participation by the community, cost sharing by the individual farmers and the community, distribution of the gains (equity) and externalities (upstream and downstream trade-offs). The geographical and social diversity created difficulties in sharing costs and benefits.

Lack of supportive policies and legislations that encourage cost sharing and private/individual and collective community actions added further complications to watershed programs. The subsidies provided to soil and water conservation investments on private lands made it difficult to assess the real farmer and community demand for the programmes. The sustainability of the benefits from watershed programs (including subsidies) was threatened due to conflicts between private land holders and the community at large (with landless laborers). The

conflicting objectives of highly heterogeneous rural social structure made it difficult to implement effective watershed management programs.

Many case studies showed that the availability of profitable technologies associated with appropriate policies and institutional arrangements and good access to markets encourage people's participation in the watershed programs. Depending on the focus given on technology support, social organization, and market access the experiences indicated that those managed by research organizations and some NGOs were more successful than many government managed watershed programs.

It has now become clear that watershed based programme has the potential for development of the rainfed areas. Access to technology, markets and equitable access to the conserved water and other economic goods and services determine the success of the program. Equity in sharing the benefits is a vital consideration for effective community (collective) participation.

The assessment of many case studies (Joshi et al 2004) have clearly shown that more research on technology generation, policy and institutional arrangements are needed to address the many gaps noted in second and third generation watershed management problems and attain the livelihood and environmental objectives in rainfed areas.

### **Contemporary Challenges:**

Rainfed agriculture in India is now in crisis. The problems of farmers have increased due to climate and market risks, increase in cost of inputs, non-availability of labour and rising cost of living. Besides, the aspirations of rural population have gone up creating dissatisfaction among the rural youths towards agriculture resulting in rapid migration to cities. The major challenge to rainfed agriculture will be sustaining the livelihoods of small and marginal farmers who will still depend on agriculture despite shrinking landholdings, manpower shortage and climatic variability. The spiral of poverty is deepening with continuous pressure on land and water resources, and shifting market forces will further aggravate the problem of rainfed agriculture in the years to come. The major challenges which need to be addressed soon are summarized below:

#### Bridging productivity gaps:

Despite rapid progress in technology generation in the research stations, the farm level yields of crops are still low indicating wide yield gaps due to slow or non-adoption of technologies. A detailed analysis of causes for these gaps and design of location specific technologies with appropriate technology transfer activities are needed to bridge these gaps. Regional imbalances in terms of technology intake capacity of farmers are to be corrected. Selecting productive genotypes with wide adaptability and resilience to variability in climate will continue to be a challenge. Lack of impact of technologies on-farm necessitates a mix of better technology adoption, institutional support and incentive systems to bridge the yield gaps and enhance sustainable production in the rainfed areas.

#### Managing risks

The greatest challenge to rainfed agriculture will continue to be risk due to erratic monsoon. Climatic risks like drought and floods coupled with edaphic constraints like poor soils with low soil organic matter contents make rainfed agriculture highly risk prone. Though there are solutions to manage this risk (as described earlier), up scaling those evidences into wider adoption continues to be a major challenge.

Risks due to market failures are also serious with small and marginal farmers. Rainfed farmers are poorly connected to markets. Including poor farmers in the value chain development will be a challenge. These farmers require outside help through policy interventions including subsidies, support prices, insurance, emergency food reserves, and other social safety nets. Actions to mitigate both bio-physical and socio-economic risks and assisting small holder farmers to become more and more able to stand on their own and become more resilient should be the major focus in the years to come. For sustainable livelihoods, appropriate technologies (including diversification,

genotypes with stable and high yields coupled with tolerance to stresses, location specific soil and water conservation measures, and integrated farming systems etc.) are to be combined with appropriate actions to manage risks. Societal and institutional support to manage the risks of these resource-poor farmers is critical in improving the productivity and sustainability in rainfed areas.

#### Changing demand profile and nutritional security:

With increasing population and changing food habits in the future the demand for cereals will be low and that for pulses, milk, meat and eggs will be higher. Therefore, rainfed farming needs to adapt to these changes with more focus on livestock, pulses and fodder crops. Also, with the increasing concerns on nutrition and health the demand for nutrition rich dry land cereals/millet will continue to grow. Similarly, there will be increasing demand for fruits and vegetables resulting in more emphasis on dry land horticulture. However, since the output of pulses has remained stagnant for a long time the challenge will be to enhance the production of pulses and oil seeds in the years to come. As most of the tribal people and farm laborers in rainfed areas suffer from protein and micronutrient malnutrition the challenge will also be to produce more protein and micronutrient rich cereals and pulses.

#### Managing water resources:

As the demand for water from non-farm sector increases, the challenge will be to enhance the water productivity (more crops per drop). Also, as noted recently, the conflicts between upstream and downstream water users may increase over time. The fall out may be conversion of presently irrigated lands into rainfed lands and the increase in ground water use. Heavy extraction of ground water will lead to other challenges such as poor water quality and excessive demand for power. Changes in water availability will determine the land use and choice of crops which could form the basis for science-based watershed management programme in the future.

#### Managing soil health:

As the dry land soils are not only thirsty but also hungry managing soil health will continue to be a major challenge. Ensuring optimum fertility of soils in the backdrop of declining soil organic matter (with declining crop residue recycling) will be a key challenge. Universal deficiency of micronutrients will also be a major issue. With the changing rainfall intensity causing more severe soil erosion, harnessing the synergy between applied nutrients and soil moisture will continue to be a challenge.

#### Climate change and climate variability:

Studies have already shown that climate change and climate variability impact agriculture in general and rainfed agriculture in particular. Climate models have shown that rainfall is likely to decline from 5 to 10% in southern parts of India whereas 10-20% increase is likely in other parts of India (CRIDA, 2015). There is also evidence to show the likely increase in extreme events and likely decline in rainy days. Annual rise in temperature (2 to 2.5 degree C) is also likely, particularly in the northern region. Crop simulation studies have shown the negative impact of future climate (changes in temperature, rainfall and CO<sub>2</sub> levels) on the rainfed crops such as sorghum, groundnut, mustard, maize and wheat. Therefore, weather based risk management in agriculture (development of resilient genotypes and management practices) will be a major challenge. The location specificity of problems, diverse farming systems and insufficient understanding of climate variability therefore calls for concerted efforts by all the stakeholders/institutions to develop climate smart agriculture.

#### Farm energy security:

Declining availability of animal power, increasing labour costs coupled with rapid migration of rural youth to cities will make small holder agriculture less profitable. Modernizing rainfed agriculture will attract youth back to farms. Increasing the efficiency of small holder farmers by farm mechanization will be a challenge in the years to come. Public private partnership to promote mechanization of small farms to reduce crop production costs and post-harvest losses and boost crop output and farm income should receive priority.

Changing Scenarios/Operational environment: Urbanization, globalization, Trade:

Increasing globalization of agricultural trade will affect the profitability of different crops. Such impacts on the economy of rainfed crops, particularly oil seeds and pulses are already evident. With growing affluence and changing food habits per capita consumption of oil seeds, pulses etc will increase with further surge in imports. Therefore, more efforts on developing a favorable trade policy to encourage domestic production of these critical commodities will be needed.

Efficiency, equity and sustainability: Policy and institutions

The challenge of national and international agricultural development in the last century had revolved mainly around “food first” imperative. In the 21<sup>st</sup> century the challenge transcends many objectives including increased agricultural productivity, poverty alleviation and economic growth and conserving natural resources. The complexities of the new challenges require reform in policies and institutions. The future policy should aim at bringing congruence between efficiency, equity and sustainability along with needed transformation in the organizational architecture. For example: the present land use and pricing policies (including subsidies and minimum price support) need relook. Policy and institutions must aim for convergence in different developmental programmes in terms of the focus, target areas and groups and efficiency of delivery. Creating a favourable environment supporting public-private partnerships in rainfed agriculture development will be a key challenge.

**Opportunities:**

Government of India has now given priority to rainfed agriculture through various agricultural and rural development schemes. For example, programmes like National mission on Sustainable agriculture (NMSA), MGNREGA, RKVY have identified several priority areas and have provision to facilitate adoption of rainfed agricultural development technologies. Also, several watershed development programmes implemented by the state governments incorporate improved technologies in their programs. The recent emphasis on pulses and oil seeds production also provides excellent opportunities to improve rainfed agriculture in India. The recent advances in modern science tools and techniques such as GIS, remote sensing, bioinformatics, nanotechnology, and information technology can be harnessed further to accelerate the development and transfer of improved technology in rainfed areas. For example, remote sensing and GIS tools can be used to demarcate boundaries for interventions within watersheds of different scale (micro catchment, basin etc.) along with the participation of the local communities. Opportunities also exist to manage risks by diversifying farming systems. Integration of livestock production, practicing agri-horti systems by diversifying with fruit, fodder and fuel woods ( agro forestry systems) etc and practicing collective or cooperative farming through farmer producer organizations will help in enhancing both productivity and risk aversion.

Some recently developed techniques and science tools which will provide greater opportunity to advance rainfed farm productivity and sustainability include:

- Conservation agriculture: Site specific and production specific conservation agricultural practices will provide opportunities for efficient conservation of resources and enhancing the productivity of systems
- Decision support systems and contingency planning: by continuous monitoring of weather events and providing crop advisories
- Agro-advisories and pest and disease forewarning
- Integrated systems and simulation modelling: to develop sustainable integrated systems and to help local governments to plan suitable adaptation and mitigation plans for emerging climate change challenges
- Remote sensing and GIS tools: to plan and monitor integrated watershed projects and land use planning. They are also extensively used for planning water harvesting structures and soil health and soil moisture mapping, and contribute to drought proofing
- Nanotechnology: can be exploited to develop variety of applications in rainfed agriculture such as improved seed germination, moisture conservation, nanofertilizers and for diagnostics for detection of plant stresses.

- Biotechnology and bioinformatics tools: to develop crops tolerant to multiple abiotic and biotic stresses.
- Information and Communication technology: to accelerate technology exchange and farm extension. Digital India programmes can be used to set up information kiosks and mobiles to cater the needs of stakeholders in rainfed areas. The government of India's ambitious goal of doubling farm incomes in the coming five years can be achieved only if the rainfed farming productivity is improved significantly by harnessing the advances in science and technology.

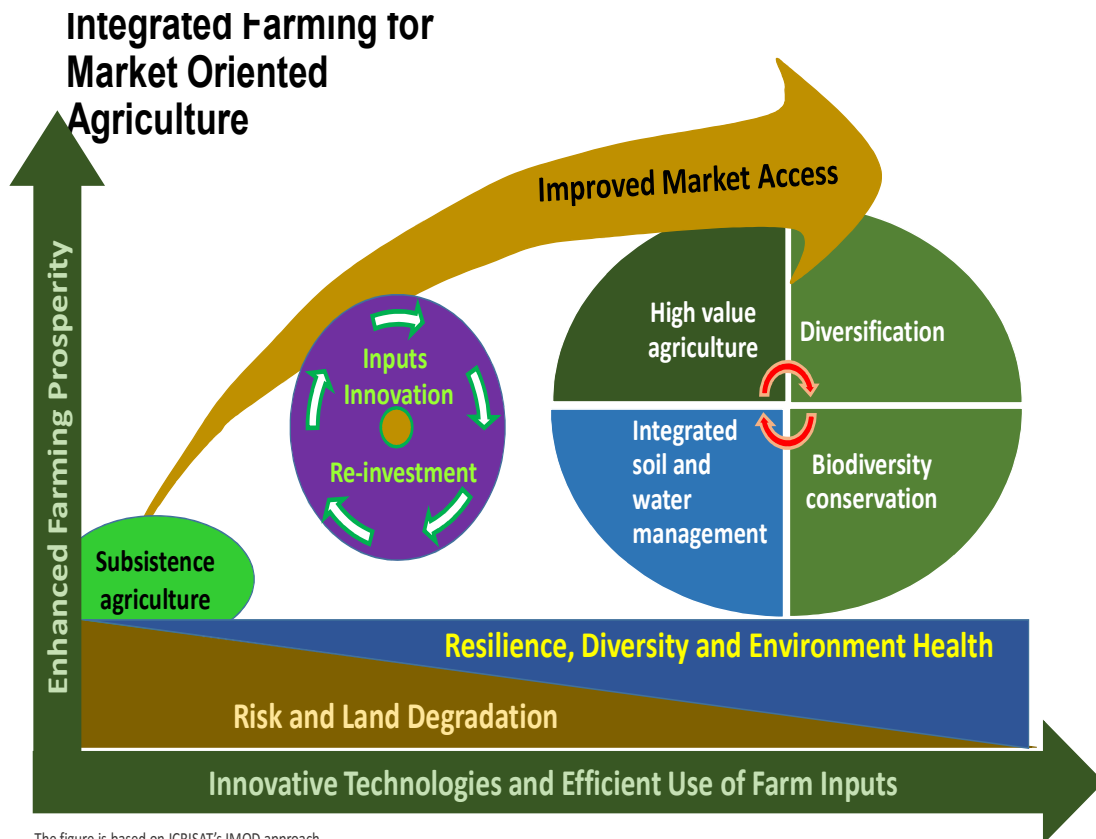
### **Opportunities for Sustainable development: the need for a holistic approach**

Rainfed agriculture has a critical role to play in achieving the UN's global sustainable development goals (UNSDG, 2030). Among the 17 SDGs targeted by the UN, those encompassing the social development ( food security, malnutrition and health, education, women and youth etc.), environmental sustainability ( sustainable use of water, soils, land and energy), economic growth ( poverty alleviation, markets, trade, entrepreneurship), scientific innovations ( ICT, genomics, mechanization) and climate change will provide much greater opportunities for rainfed agricultural development in the future. However, to address the many challenges as noted earlier, and to aim for an inclusive rural development and sustainable environment, alternative and holistic approaches are needed. Such alternative holistic approaches should build on partnerships across the whole agricultural value chains utilizing science backed interventions and follow the pathway to developmental impact.

In the past, the agricultural development was mainly aimed through specific commodity improvement and natural resources management, with limited attention on holistic solutions in an integrated manner. This approach resulted in rather slow adoption of improved technologies. Recently, some research and development efforts have been directed towards examining the whole agricultural value chain and identifying solutions to strengthen these value chains through improved technology and policy interventions. Still, efforts to combine the improved agricultural value chains (through component research and development) and sustainable and efficient use of resources are still in its infancy. Holistic solutions integrating social dimensions with sustainable intensification and building agribusinesses to achieve wider development impact have now been advocated by agricultural research and development organizations (ICRISAT, 2015). One such approach is described below:

#### Integrated market oriented rainfed agricultural development:

In 2008, the World Bank produced a comprehensive analysis of new trends in agriculture which is perhaps the most authoritative study ever developed on agriculture (World Bank, 2008). It narrated the history including the events of 1990s such as globalization, economic liberalization, structural adjustment, market deregulation etc., which contributed to industrial and urban development, but they hit the rural poor and small farmers hard. The marginal and small farmers were left on their own resulting in them not only food insecure but also poor. The report also established causal linkages between rural poverty and state of small farm agriculture in marginal areas and strongly advocated that agriculture should be developed to reduce poverty and accelerate economic growth. The study report's summary states "an emerging vision of agriculture for development redefines the roles of producers, the private sector and the state. Production is mainly by smallholders, who are most efficient producers particularly when supported by their organizations. The private sector drives the organization of value chains that brings the market to small farmers. The state corrects market failures, regulates competition and supports the greater inclusion of smallholders and rural workers. In this emerging vision agriculture assumes a prominent role in the development agenda ... and for implementing this vision the policy objective in agriculture for development should be to improve access to markets and establish efficient value chains". Utilizing this context of alternative vision for agricultural development, the global team of ICRISAT and its partners developed its new strategy for the decade 2011-20 called Inclusive Market oriented Development (IMOD). The centre piece of this new strategy is—that to escape hunger and poverty in the dry lands, small holder farmers needed to have better connections to markets. Recently, several research and development organizations have been adopting the IMOD model in their strategy and action plans. A modified version of this alternative approach representing big picture of integrated and inclusive farming for market oriented rainfed agriculture as conceptualized by GRSV Consulting Services, 2016 is shown below:



The important element in the above diagram is the bold curve in the middle which represents the harnessing markets benefitting the small farmers and the rural poor, driving them from impoverished subsistence farming towards more prosperous market orientation. Conventional value chains don't have this focus on small and poor farmers, with only large farmers and the middlemen capturing most of the market access.

Underneath the curve is the rotating wheel which is the "engine of growth" that helps increasing the income of the small holders and rural poor. This dynamic engine of growth is "fueled" by the innovations (technologies) and investment (both private and public). Note that these innovations and investments are different than those found in conventional value chains which generally favor the better resource endowed large farmers and middle agents. Also, note that the investments refer to both physical inputs and socio-economic (including policy) interventions.

The third major dimension, the platform represented at the bottom of the diagram is on managing the risks that poor rainfed farmers face regularly. Managing the risks and enhancing the resilience is very important particularly for poor and small rainfed farmers because they have few resources to fall back on if something goes wrong. Diversification and conservation of biodiversity and appropriate land management practices to halt degradation are essential for risk management. For poor and subsistence farmers risk management also requires societal help through developmental assistance such as subsidies, credits and insurances, minimum support prices, emergency food reserves and other safety nets. Appropriate policy interventions are therefore critical not only to link small farmers to markets but also to encourage private sector to invest in rainfed agriculture development. It is also important to recognize that as the farmers' incomes increase through market linkages they become more and more resilient and stand on their own with minimal need for outside help and safety nets.

There are many more interesting angles to this alternative model of agricultural development. Just to mention a few: This model is dynamic and is a process of moving along the development pathway from hitherto static and impoverished subsistence farming to more prosperous market oriented and diversified agriculture. The model highlights the importance of both public and private interventions to pull farmers from poverty towards prosperity. The model also combines the development/prosperity dimension with sustainability (resilience, environmental health) and equity (risk aversion, inclusiveness). Several factors determine the success of this alternative model of rainfed agricultural development. Some key factors include:

- Innovative institutional arrangements to link farmers to markets and end users (farm to fork, or plate to plough linkages) to reduce transaction costs and improve market efficiency: these include contract farming, direct marketing (bazaars and Sante), cooperative farming, farmers' associations, producers company and ICT enabled supply chains (Parthasarathy Rao, personal communication). The current initiatives would be successful only if the government creates a policy environment for scaling up and active public and private sector participation.
- Fostering agro-enterprises: by engaging private sector to accelerate the adoption and impact. More efforts on building agribusinesses through processing, facilitating market access, and driving market development are needed.
- Active public-private partnerships for holistic approach to development: To make bigger impact a consortium of all stakeholders working on a common platform contributing different skills towards development impact pathway is needed. Forming alliances with input and output traders and training youth and women in high value village based enterprises need to be intensified.
- Institutional reforms: To keep pace with the rapid global changes the present research and development institutions need to undergo a thorough review leading to concrete efforts to ensure new ways of doing business. The roles of various public institutions must be defined to avoid business as usual and duplication of efforts. The research and technology transfer institutions should work in sync and efforts should be made to encourage forming alliances with other private and public institutions.

#### **Concluding remarks: Looking ahead**

The government India and various state governments have now given high priority to agricultural development to reach the Prime Minister's vision of doubling farmers' income by 2022 through various development missions. They include National Mission for Sustainable Agriculture (horticultural mission, soil health card mission, pulses revolution etc), National Mission on Strategic knowledge on Climate Change, National Solar Mission, National Mission on Enhanced Energy Efficiency, National Water Mission and National Mission on Sustainable Habitat and also programs on subsidy support to farm insurance, minimum income and support pricing. Also, programs being implemented by various research and development organizations including ICAR, ICRISAT and Agricultural Universities will help developing the required technologies for rainfed agriculture development. The opportunities to improve rainfed agricultural productivity also exist through various other priority programmes such as enhancement of pulses and oil seeds production. A consolidated holistic approach with the convergence of these various government programmes at regional and local level will help in delivering desired outputs. There is a need to reform the agricultural technology management institutions to meet the new challenges by avoiding duplication and enhancing efficiency. Special emphasis is needed to use social science skills for scaling up research outputs into social outcomes and development impacts through appropriate policy interventions.

Considering the growing vulnerabilities of rainfed agriculture to climate change, mitigation and adaptation strategies to build resilience should receive high priority. Designing climate smart agriculture coupled with enhancing farmer income through market linkage should be the central focus in the years ahead. A mission mode approach by bringing all the stakeholders including the public and private sectors with expertise across the whole rainfed agricultural value chain together on a common platform is necessary for inclusive sustainable development. Many technological advances for profitable agriculture are now in place, but scaling up these advances into a wider and sustainable rural development in rainfed areas should be the common goal. The use of ICT in technology transfer will help in achieving the vision of digital agricultural revolution.

The international and national research organizations continue to address critical and evolving challenges to rainfed agriculture through strategic and applied research using frontier tools. The regional and local institutions should form consortia to undertake action research and evolve location specific innovations and technology dissemination. The bio-physical and social scientists together should guide the policy makers in undertaking appropriate policy reforms and provide safety nets for wider scale adoption towards enhancing the livelihood security and sustainable development in rainfed farming areas.

Goal 1 and 2 of the UN Sustainable development goals envision eradicating poverty and hunger by 2030. Adopting sustainable business models along with appropriate innovations and partnerships in rainfed agriculture is crucial for achieving these goals.

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#### **010015 VOMBATKERE, S G (Vijaynagar, Fourth Stage, Mysuru – 570017). ENERGY, ECONOMICS & CLIMATE CHANGE**

This paper attempts to “join the dots” between the subjects of energy, economics and climate change.

Energy availability in society is primarily based upon fossil fuels, namely oil and to a lesser extent, coal. Sources and forms of energy other than fossil fuels, all depend upon oil for primary extraction (mining) and for downstream raw material processing, product manufacture & marketing, and transportation at every stage.

Energy audit based upon ERoEI (energy-returned-on-energy-invested) demonstrates the almost total dependence upon non-renewable oil resource in modern economies.

However, a majority of planners believe that human ingenuity in science & technology (S&T) will deliver some solution to overcome this dependence including making present energy use more efficient. This could be unrealistic optimism.



For example, efficient automotive engines reduce exhaust emission air pollution by efficient fuel combustion and less pollution per automobile. But this increases total automotive sales and results in huge increase in total fuel consumed and rise in total exhaust emissions. Thus, technological progress increases the efficiency with which the resource is used, but the rate of consumption of that resource rises due to increasing demand.

This also leads to growth of GDP through (in this example) the automotive industry. The currently accepted economic paradigm dictates economic growth through GDP growth, as the aim of “development”. Energy-intensive technologies which are the drivers of economic growth inevitably increase pollution. Transportation, which is the life-blood of modern economies to move materials and goods, is 100% fossil fuel dependent.

A little thought shows that even nuclear energy and renewable energy technologies fundamentally need oil for transportation and producing the infrastructure and hardware.

Economic growth is a percentage based upon the status at the end of the previous year. It represents growth compounded every year. This compounded growth is essentially endless or perpetual, and is directly connected with availability, affordability and consumption of oil-based energy. Economic growth depends on year-upon-year oil consumption growth.

The economic cycle draws material inputs from the environment and produces money measured by GDP. Money is expended to increase, diversify and speed-up the mining-processing-manufacture-marketing-transportation process. This cycle results in depletion of natural capital including oil. The resulting pollution degrades the “ecological capital”, with attendant ill-effects on society due to population-displacements, impoverishment, environment-related health issues and social tensions. This endless cycle of economic growth impacts increasing numbers of people, especially those sections of society which are adversely affected by depletion of natural capital, and its downstream environmental and social effects.

It is unrealistic to believe that the real-world of finite natural resources can support the present economic paradigm of perpetual economic growth (Kenneth Boulding).

Oil is universal currency. Like any natural resource, oil production is initially easy and cheap, levels out over time, and later becomes increasingly difficult and expensive. Thus, non-renewable oil reserves get depleted and reduce oil availability and affordability for consumption.

When money-supply and oil-production are considered together, we observe that these two grew at almost the same rate until 1971, since money production was based upon the gold standard, and oil was produced, purchased and consumed using this money. But money production and supply was delinked from the gold standard in 1971. Money production rose exponentially even as oil production began to level out and peak. This exponentially growing divergence between money-supply and oil-production is already adversely affecting the world economy, as societies face rising debt. It may force adjustment to lower energy availability, since oil reserves are finite.

Every industrial product from umbrellas to airplanes, polyethylene products to armaments are manufactured using energy almost entirely from oil. They consume natural resources and all eventually become “junk”, polluting the environment (earth, water and air) at some place on the planet. The industrializing world thus increasingly degrades the environment with the pollution caused by increasing quantities of energy extracted and consumed in the cycle of primary resource extraction, processing, product manufacture, marketing and use. The environment is used both as a source of materials and as a sink for disposal of wastes. But the current economic paradigm fails to understand that this is self-limiting.

Spurred by the perpetual quantitative economic growth paradigm, industrialization has led to exponential energy consumption, in turn accelerating generation of greenhouse gases, driving climate change. This is evidenced

by galloping polar melt, ocean-bed methane release and forest fires, all of which are hurtling the globe towards an irreversible tipping point.

This economic paradigm has no handle on addressing global warming and climate change. Sustainable Development Goals (SDGs) to end poverty, protect the planet and ensure that all people enjoy peace and prosperity cannot succeed so long as development is predicated on unending economic growth.

## PART II

## PUBLIC/SPECIAL LECTURES

**0200016 GANESHAM, BRIGADIER P (Vayupuri, Road No 5, Vayupuri, Post-Sainikpuri, Secunderabad-500094). ROLE OF TRADITIONAL AND MODERN SCIENCE IN HEALTH OF PEOPLE**

Health of people is paramount for any Nation. All over the world, Govts are grappled with the complexity of providing health care to their people. National Health policies across the world vary due to the varying perceptions on Health, water, food, environment, and prevention and cure of diseases. Accordingly their effectiveness too is varying across the globe. While modern science is continuously providing solutions to deal with diseases, more people are getting sick and spending substantial amounts on treatment to reduce their pain and death.

Health is not medicine. People, Govts and the medical professionals should comprehend this truth and factor in the same into Health policies and health education of Nations. Traditional medical practices, systems which ensured survival of human race over thousands of years should be treated with respect. Best and contextually relevant methods should be sustained and used extensively. System of family doctor/Vaid is one such practice which was prevalent for many centuries should be reinstated to ensure immediate and continuous health advice to the people. Traditional and folklore healers should be encouraged and made part of National Health system by accepting their treatment methods after due validation. Preservation and growth of herbals required to provide health care to people should be concurrently taken up synchronizing with the demand and need. A large number of Nations align their Health Policy with only the modern medical science and its practioners. Veracity of such approach needs to be ascertained by public debate especially in India.

Health is a function of many. It is described as the combination of an individual's "Achaar, Vyavahar and Samskar". Routine of life, quality of work life and the ethos of life all are different for individuals. Though efforts are made over the centuries to bind all people to a standardized way of life and samskar, success eluded. Religions in my view, were conceived and designed to ensure a standardized behaviour of people towards other humans and fellow living beings. Ultimately, what matters is the positive and greedless behaviour of each individual wherever she is. Hence, let us look at the Health holistically as a system containing many sub-systems and a collaboration and synchronous behaviour of all of them would possibly lead to a healthier world. Traditional and modern science coopted with human behaviour may provide us a better and healthy solution.

**0200017 GAUR, VINOD K (Indian Institute of Astrophysics, Bangalore-560034). SOCIAL IMPERATIVES OF SCIENCE IN THE 21<sup>ST</sup> CENTURY**

The title begs the questions: whether Science has acquired a new imperative in the 21<sup>st</sup> century relating to Society or whether the social imperatives of Science in the 21<sup>st</sup> century are different from what they were or might have been, if any, in earlier centuries. To explore these questions, we need to clearly understand the nature of the scientific enterprise, its drivers, its goals and its approaches. Indeed, Science is all these: a curiosity driven *enquiry* into the workings of Nature; the resulting body of knowledge in terms of *testable explanations* and a perpetually active methodical *scepticism* to better and deepen this understanding. These attributes of Science, in turn, predicate its immutable *values*. Inspired by nothing else but an innate curiosity and the joyful pursuit of testable explanations and predictions about the universe. Forever open to scrutiny and correction, its prime value is necessarily 'Truth' or a relentless pursuit of Truth by a built-in mechanism for eliminating aberrant inferences and judgements. Its self driven motive is to intuit testable explanatory principles that may be checked by anyone interested in doing so using transparent logic, which predicates other values: respect for democratic participation and independent judgement, equal operation of processes under identical conditions which is the fundamental principle of *Symmetry*, whereby Nature shines its universe – equally in all directions.

So, where does Society come in this? Scientists are members of Society and supported by it in their pursuits, even as in doing so, they follow their own motivations without regard to society's immediate concerns. Society supports this non-obligatory activity of Science because it values the deeper insights and conceptual

frameworks that are aimed at, and recognizes the desirability of building and maintaining long lasting institutional infrastructure to nurture thought and imagination necessary for the sprouting of creative ideas. The fruits when they form are cherished as a people's enduring contributions to the global heritage of mankind. Thus, we proudly count the imagination of the zero – the empty set – and several other iconic mathematical forms conceived by the 7<sup>th</sup> century mathematician Brahmagupta<sup>1</sup>, the mock theta functions of fundamental significance conceived by Ramanujan<sup>2</sup> in his dying year, the Raman effect<sup>3</sup> that has deepened our penetrative gaze into the structure of matter, amongst others, as India's unique contributions to humankind's fundamental elements of cognition. The same values lie behind India's significant participation today in the exciting global endeavours aimed at penetrating even deeper into the structure of the universe and the unity of its fundamental principles – the large Hadron collider at CERN and the Laser Interferometer Gravitational-Wave Observations (*LIGO*).

In supporting such endeavours that may not be of any immediate benefit, society clearly recognizes the enduring value of reliably constructed body of conceptual knowledge together with science's built-in quest for progressively deepening this knowledge, as its most valuable human resource for navigating through a changing world order. It is sobering to recognize, however, that the perspective of Science sketched above, also spells out the necessary conditions for its flourishing: the autonomy of free enquiry and untrammelled spaces for dialectics. Indeed, history is witness to withering episodes of Science whenever Society chose to suppress these conditions, as happened to Christian Europe in the first millennium AD, and ominously in the 21st century India as echoed by the banning of A.K. Ramanujan's 100 Ramayanas from the History Curriculum of Delhi University.

Society derives its dividends from Science in terms of materials and infrastructure created by *applications* of scientifically tested knowledge. Creative applications of patterns in the universe to secure better living and subsistence conditions, were devised by Sapiens tens of thousand years before we learnt to systematize and validate scientific knowledge that could be used to design and produce the bewildering range of artefacts and systems that feed and fashion our aspirations and lifestyles today.

Thus, the fire piston used by ancient tribes to convert work into heat and fire, evolved into the invention of guns in 12<sup>th</sup> century China that used explosions in a metal body with a tight fitting projectile to convert hot gases into forward motion and further into Taqi al Din's steam turbine in 1551 and the first piston steam engine by Denis Papin in 1690. Later around the turn of the nineteenth century as scientific enquiry led to quantification of material behaviour, especially gases, under heat and pressure, as well as of the limits to the efficiencies of energy conversion, heat engines of increasing sophistication began to be constructed to substitute a wide variety of works which, until then, were performed by manual labour from spinning to transport and power.

Meanwhile innovative applications of new knowledge about the structure and processes of living matter at the cellular level, such as the recognition of new plant-type genes in wheat and rice, and identification of chemical molecules that kill bacteria selectively, greatly reduced the threats posed to society by famine and pestilence. The resulting explosion of human populations further fuelled the spread of heat engines and their collateral industries in a run-away manner requiring the extraction of an ever larger amount of metals and fuels from their slow and steadily concentrated repositories in the earth. A grievously unintended consequence of this development has been the steadily degrading state of our soils, water and air, caused by the ever increasing amount of waste products dumped into them, now manifest in the ongoing warming of our planet. Twelve millenia after human societies turned to settled agriculture consciously using earth resources in a modest way, ours, because of their witless over-exploitation, faces an uncertain future: food and water scarcity, pestilence and antibacterial resistance.

Around the middle of the 20<sup>th</sup> century when these piecemeal applications of scientific knowledge were transforming society, and the environment in that process, David Keeling<sup>4</sup> using fundamental insights created by Arrhenius half a century earlier, showed that the carbon waste of burnt fuels released in the atmosphere would lead to global warming. As far back as 1945, Alexander Fleming who had discovered Penicillin in 1928, had warned<sup>5</sup> against the overuse of the drug as it clearly drives the evolution of resistant strains. Indeed, deep thinkers had long emphasized the interconnectedness of the natural and the human realms and in 1940, a General Systems theory<sup>6</sup> was proposed by the Austrian biologist Bertalanffy in an attempt to revive the 'unity of science' that had been lost to 'reductionism' in the 17<sup>th</sup> century. These ideas clearly implied that the state of a composite system, of which an

ecological system is an iconic example, is the result of constant adjustments by each one of its parts to feedbacks from the others. Therefore, for a given 'state' of the system to remain in equilibrium so as to support existing conditions, each part of the system must maintain a balance between its inputs and outputs, thereby setting *Limits*. One may ponder, however, as to how come, in the midst of all this wisdom, we have come to such a sorry state. Feynman recounts<sup>7</sup> what the Buddhist monk said to him when he was taken to the temple in Hawaii, "*To every man is given the key to the gates of heaven. The same key opens the gates of hell.*" And, so it is with Science.

But, if science is humanity's most potent resource, it cannot remain unappealed for a new covenant in order to stem the tide. It must respond to Society's new concerns. It must recognize its Social Imperatives. It needs be redefined, because 'science' today denotes such a very wide range of activities covering both natural and social worlds. Ten years ago, the Science Council of Britain which had been established in 2003 by a Royal Charter, adopted the following definition<sup>8</sup> of 'Science', after a whole year of deliberations

*"Science is the pursuit of knowledge and understanding of the natural and social world following a systematic methodology based on evidence".*

To my knowledge, this is the first explicit statement about 'Science' which includes the pursuit of knowledge and understanding of the social world, even as the idea of social science, first appeared in 1824 in a book on economics by William Thompson, and was established by Auguste Comte<sup>9</sup> in 1838 - the first one to realize the importance of relating sociology with science. Comte's social science is explained in his major work, "*Positive Philosophy*", that society has its own set of laws under which it is operated, similar to the physical world, and can be objectively studied using a standardized form. **The definition of 'Science' adopted by Britain's Science Council underlines this condition through the words: 'systematic methodology' and 'evidence'.**

Indeed, the Social imperatives of 'Science' posed by the quandries of our own times are pithily implied in the above definition that explicitly unfolds the fuller canvass of the 'Natural world' to show its inalienable 'Human' part, whilst retaining the self cleansing mechanism of 'Science'. And, the pursuit of knowledge and understanding of this 'whole' of the natural world is the first and foremost charge on the 'Science' of our century, in order to be able to address the concerns that threaten the continued existence of homo sapiens on earth - in short, the pursuit of knowledge and understanding of the behaviour of *complex systems*.

It would be presumptuous for anyone to draw a list of necessary corollaries for action that would achieve this desideratum. An initial condition, however, appears to be the spontaneous coming together of scientists to conceive overarching conceptual frameworks within which a wide variety of data relating to biophysical as well as human elements of the earth system could be consistently analyzed to shed light on deeper lying principles. Such spontaneous acts, however, need a catalyzing milieu fired by a shared idea pervading amongst the citizenry as much as the academia, including those tasked with the formulation of policies and design of management systems. The route to this goal, in turn, lies in provoking thought over a wide front of citizenry using various channels that animate public discourse and debates.

### **The Science of Complex Systems**

At the very outset, it is well to recognize that Scientific approaches to understand the behaviour of complex systems is fundamentally different from the extant approaches adopted to study the behaviour of systems isolated from their environment, even as knowledge and understanding gained from the latter have been used to fashion a phenomenal range of applications to create our modern designed world. The difference stems from the recognition that unlike the behaviour of designed systems which is determined by the well understood behaviour of their components, howsoever numerous (e.g., an aircraft), the behaviour of complex systems cannot be constructed from a knowledge of the behaviour of their constituents, any more than knowledge of the workings of our body organs can be used to construct the behaviour of the brain. Furthermore, complex systems, while ceaselessly at work to conserve the fluxes of matter and energy across their multitudinous interfaces to adjust to inter-system feedbacks, are always in a state of dynamic equilibrium for ever reconfiguring themselves, howsoever, imperceptibly, into new

‘collectively emerging’ states, such as the stock exchange. Clearly, the Science of complexity must aim at constructing an overarching conceptual framework from which could be deduced the ever burgeoning set of diverse empirical facts relating to both Society and its environment. . It must design new evocative paradigms for interrogating the natural world that includes the human, to discover quantitative laws that forge the empirically observed precise regularities in the behaviour of large systems from the interactions of its disparately behaving constituents.

In fact Physicists too, in the latter half of the 19<sup>th</sup> century, grappled with an analogous problem in attempting to explain the empirically established behavior of gases, in terms of the well known behaviour of single particles. They soon realized the futility of doing so as even a small volume of gas consisted of billions of molecules. Out of this impasse, however, was born an even richer set of concepts drawing on probability theory and statistics, which not only explained the observed thermodynamic properties of gases in terms of their states represented by ensembles, but also led to a deeper understanding of their internal organization. Indeed, as far back as 1938, Ettore Majorana<sup>10</sup> had persuasively argued for exploring further enrichment of these concepts to extend to social sciences, but serious attempts at such synthesis remain in being because of the great chasm of non-commensurability between the conceptual frameworks created in isolation by a reductionist approach to knowledge. Exciting intellectual challenges both in social and other sciences lie in intuiting the deeper lying conceptual landscapes that surface in the variegated texture of human as well as natural systems. Such endaeuvres, to my mind, constitute the social Imperatives of Science, today

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**0224018 RAO, K. ASHOK (National Confederation of Officers Associations of Central Public Sector Undertakings). DISMANTLING THE PUBLIC SECTOR: ADHOCISM, FRAUGHT WITH DANGER**

In June 2019, President Shri Ram Nath Kovind, addressing the joint sitting of both Houses of Parliament gave an assurance that “The government will soon announce a new industrial policy.” Even prior to announcing a policy, radical changes are being undertaken, reflecting not only poor governance but denial of any form of public or

Parliamentary debate. There is growing evidence that public sector companies and assets are being sold to bridge the fiscal deficit. Are priorities being driven by fiscal compulsions rather than addressing issues arising out of national and international economic and security environment?

India was decolonised barely seven decades ago. Industrialisation had to be undertaken within serious constraints such as, i) uneven distribution of resources, income, and political power and consequences of concentration of wealth, resources and power in socially unaccountable private hands ii) lack of infrastructure iii) lack of technological and managerial skills and institutions that could generate the skills iv) power of international cartels and multinational corporations and their home governments. All these concerns had to be addressed along with a multitude of social and economic problems accentuated by abysmal poverty, and a weak capital base. It was only through reasonably good policy and planning, careful deployment of resources, uncomfortable restrictions coupled with a shrewd foreign policy that a strong base could be built.

The situation today is characterised by uncertainty. More than ever before, ability and resilience of Governments of the Third World in dealing with international pressures, particularly political and economic sanctions is perhaps the most important concern. The very same forces that, in the name of competition, created institutions like the World Trade Organisation, in order to prance open, with a crowbar, the markets of the Third World. They are today seeking protectionism for themselves. There is an eclipse of long-term policies in transnational trade diplomacy. The Bretton Wood twins that supported States role in building infrastructure, like electric power, withdrew support following the Reaganite- Thatcherite neo-liberal paradigm. They are now pushing market reforms and changes in legislation of Third World countries to enable foreign investments to take control Non-Governmental institutions like the World Economic Forum have been created to usher in an era of Public-Private Cooperation.

Given this domestic and international framework where does the regulatory power of the state fit in? It is not just the change of ownership of private replacing public or the commanding heights of the economy shifting from the public to the private sector, that is a matter of concern. More important is the question, once the private sector attains the commanding heights, what would be the levers for governance available with the Government of India. Even with the public sector presence, market intervention was difficult since after 1991, most of the sectors are to be regulated by independent regulators? Government need instruments that would enable them to make market intervention either to control prices or handle distress conditions or manage/ control predatory behaviour of multinational corporations, backed by their home governments. Since 1991, what we have witnessed is the steady growth of crony capitalism enabled by regulatory capture. Gaining and retaining “investor confidence” has become the most prominent consideration in economic policy formulation.

With the closure or sale of BSNL and MTNL, the entire telecom sector would shift to the private sector. Similarly, with the sale of Air India, the entire commercial airlines or civil aviation would move over entirely to the private sector. With Governments emphasis of private renewable energy generation, as well as, coercive pressure being put on State Governments to privatisation of distribution it's a matter of time before the power sector also moves over entirely to the private sector. Even in social infrastructure, with crumbling Government hospitals and shifting of patients from public funded health schemes, like CGHS, PSU employee health schemes, to the private sector the health sector would for all practical purposes be the monopoly of the private sector. (Space does not permit a discussion of how and why the public sector units came to this situation.). What is the state of the private sector, Between the telecom and power sectors, the private sector companies have almost ten lakh crores of outstanding debt with the banks? Instead of competition there is grow evidence of monopoly and oligopoly. In the telecom sector for example, one company has with State support become the market leader and is going towards having monopoly control over the entire spectrum of IT application. The situation is no better in the social sector, medical indebtedness is one of the critical reasons for India's household debt surging 1.8 times from Rs 3.7 lakh crore to Rs 6.74 lakh crore between 2016-17 and 2017-18 and growing at an annualised rate of over 13% in the past 5 years. A critical question that begs for an answer is does the withdrawal of the State from basic infrastructure enable or prevent the State from regulating economic activity?

Even in sectors where geo-politics and national security should be the principal concern, there is adhocism and absence of a long term perspective. The petroleum sector is fraught with the danger of powerful multinationals and their home governments destabilising indigenous sector. ONGC was made to purchase HPCL not as part of a master plan to create an integrated oil major in India, but just to extract the surplus funds available with ONGC. Now the impact of this sale is being felt. ONGC has been asked to sell shares of HPCL. BPCL is also to be sold. With the sale of BPCL and permission to ONGC to sell shares of HPCL, the foot hold of the private sector in the petroleum sector would get well established. Has the nation forgotten that during the war with Pakistan, leading to the creation of Bangladesh, Caltex the US company, refused to cooperate with the Government of India and that was the main motivator for nationalisation?

The policy of the United States is spelled out quite unambiguously, "*George Kennan, Chief Planning State Department of Policy Planning, proposed in 1949 that US control over Japanese oil imports would help to provide "veto power" over Japanese military and industrial policies. This advice was followed. Japan was helped to industrialize but US maintained control over its energy supplies*". Noam Chomsky Detering Democracy). Today, more than ever before one needs to ask, how would India handle economic and political sanctions that have become the staple diet of U.S. foreign policy? With Reliance selling 20% stake in oil-to-chemicals arm to Saudi Aramco the multinational entry into this sector has started. In such a geo-political framework, what instrument are left with the Govt. of India to prevent them from being taken over by the much more financially and politically powerful Multinational oil giants.

Even vital public sector units providing national security are being subject to adhocism. If the imports of components made by the Public sector is included, the import content in the Defence sector is close to 85 %. The Public sector, together with Defence laboratories, have been able to acquire some strategic technologies and manufacturing capabilities that have supported the Indian Armed forces in three wars. It is important for the Government to clearly define the role they envisage for the public sector, in the overall Defence policy.

Industrialisation requires much more than mere slogans like "Make in India" Neither privatisation nor making concessions to private and multinational capital or ease of business has achieved any noteworthy results. There is a need for a long-term vision and very systematic and concerted planning by the public sector enterprise and the Government working in unison. A comparison between China and India is worth noting. There are hardly a dozen countries in the world that have an equivalent of Bharat Heavy Electricals Ltd. (BHEL). China was a late starter. While the Indian market was intermediated by World Bank and other foreign funds requiring mandatory international competitive bidding based on specification finalised by the World Bank. China ensured that if foreign and domestic manufacturers had the same terms and conditions, preference must be given to the domestic manufacturer.

When international competition intensified, China declared the power equipment manufacturers "National Champion". With global emphasis on climate change, China realised the compulsions of shifting away from coal. China quickly moved towards becoming a leading exporter. The 34 private thermal power producers set up in India, imported entire equipment from China. These imports were equivalent to four years of production of BHEL. Today, the entire power equipment manufacturing industry in India, including the private sector, is working on less than 30 % installed capacity.

Dismantling instruments designed to address this concern raised above, without a long term vision, based on short sighted concern like balancing the books of the Government would jeopardise the future of the growing population, living within the confines of a limited and highly skewed resource base. The least that the Government can do is to subject their irreversible policies to public and parliamentary scrutiny.



## PART III

## RESEARCH COMMITTEES' CHAIRPERSONS' ADDRESS

## 02. ANTHROPOLOGY

**0302019 SUMATHI, S AND MANJUBARKAVI, S (Department of Anthropology, University of Madras, Chennai - 600005). EMERGING 'PART' (THEORY) AND ITS INTEGRATION WITH THE 'WHOLE'**

Society, culture, and community are our everyday reality, yet we do not understand much about them, may be by virtue of living within such institutions, we take these institutions for granted. The social sciences theorists have been evolving 'theories' periodically through their grounded intellectual currents and validate these institutions as concepts. The emerging new concepts and theories provide relatively better understanding than the fading older ones. Such efforts in academia strengthen the sustenance of every discipline and demonstrate its contemporary relevance. Though Anthropology has been perceived as a latecomer in the Social Sciences basket, its subject matter and the unique research principles provide scope in every school of thought and justify the components of 'culture'.

There are many popular concepts and theories in social sciences, humanities, linguistics, management, computational social sciences, and others which have validated the relevance of the grand concept of 'culture'. The functionalist proposed concept of 'part and whole' and its integration with physiological, cosmological, structural, psychological, and post-modernism principles is well established. A spirit of multidisciplinary approach/method has surfaced through the concept of 'part and whole' perspective, appreciating 'grounded theories'. Anthropology, with its strong theoretical base, inculcates the values of acceptance and appreciates the 'others' in theories, methods, and application. The emerging concepts like 'new/auto/ethnography', engaged, experimental, integrative and such other approaches open new horizons, providing theoretical sustainability for anthropology.

This paper compiles author's three decades of research on the occurrence of alternative realities, open-ended epistemology, and 'theoretical-practical' interpretation, patterned with enough validating anthropology. Further, each discipline must preserve its knowledge—and its territory or "turf," if you will—in specific institutional forms and perpetuate those institutions over generations. Such *alternative social construction of knowledge* opens up the process of creation, innovation, perpetuation, transmission, and institutionalization of academia and also enhances passion towards one's own discipline.

**Keywords: Part and whole, Integrative approaches, theoretical-practical, ethnography, discipline-specific, and hard & soft (skills).**

## Introduction

The notion of science by J.D. Bernal (1954) authenticates extensively the intervention of the social function and the historical development from antiquity to the contemporary period. In his monumental work, he has proved the relevance of social function and historical development through foundational part perspective of scientists combining with contemporary relevance with whole institutional framework of science. Today we have millions of different professionals directly or indirectly involved in scientific activities with multidisciplinary approach and as a consequence of the above very outlook providing alternative approaches in science studies. Further, Bernal points out that disciplines like medicine and engineering are believed to be less dependent on such tradition of applied techniques, though both are heavily permeated by the findings of scientific theories; they are yet quite distinct from the reality of applied (socio-cultural) scientific approaches. He furthermore mentioned that the specialised science has also distanced it from the "common avocations of a society (Delhi Science Forum, 1989).

Sheehan (2007), also substantiated Bernal's pioneered critical approach in classifying the discipline as STS (Science Technology Society), science studies, the science of science, and social studies of science and justified his views and commented how such constructed taxonomy influenced the academia and also provide space for radical

critique of such cherished assumptions and determining structures of power. She perceived him as a leading light in a movement for the social responsibility of science and also brought science to bear in war and then turned his energies to peace. Bernal's perspective was multiple and as he was Marxist in philosophy, communist in politics, polyamorous in sexuality.

Bernal's concept of dialectical materialism validated the principle of a science of the sciences, a way of integrating the sciences, a way of contextualising science in deep socio-historical perspective following Boasian's (1852-1942) theory. He saw Marxist philosophy of science as a means of overcoming overspecialisation and achieving the unity of science. The consequence or consequences of the growth of science was ever widening based on human experience that were gradually well suited with the constructed social hierarchy. This is clearly visible in the sequential development of disciplines like mathematics, astronomy, mechanics, physics, chemistry, biology, finally sociology and the least could be anthropology. As opposed to this constructed so called scientific model, the contemporary lessons learnt through multidisciplinary development and technology resulted to be quite the reverse and the sequence commences with social organisation (Delhi Science Forum, 1989). The international history of science congress held at Princeton University and at the Science Museum in London during 2006, the Soviet and British Marxists came into such consequential interaction about the intellectual justification of Bernal's view.

In anthropology, as in any other discipline, there is continual ebb and flow of theoretical orientation which arises and may grow in popularity until another is proposed in variance to it. Often, one orientation will capitalize on those aspects of a problem that a previous orientation ignored or played down. The emergence of every school of thought has been reviewed from evolutionary to post modernism and the validated universal principles that have developed since facilitated growing of anthropology as a professional discipline. Such a process proved the very scientific spirit of that there is nothing called 'the theory', and 'the science'.

The most obvious and epistemologically far-reaching development in contradictory theorizing, discrediting and undermining the 'stable' paradigm leading to a 'loss of vision' and mostly it was perceived as the failure of the 'social sciences, though it justifies the positivist laws-and-causes 'social physics' kind. This was achieved through postmodern critique, particularly simplistic science versus anti-science in which science became a 'meta-narrative' to be treated with incredulity and with scepticism (Reyna, 2001).

There are a number of observations we can make about these developments, we might group into two apparently contradictory trends: one moving away from positivist and science-based ideas of theory altogether, a second (pro-theory, but not necessarily pro-'science' in the narrow laments its neglect. In terms of the first, the retreat into ethnography, although worst self-referential, obscure, and irrelevant, has at least moved the theorizing at different levels of understanding and interpretation, and provide space to justify about qualitative research practices and writing.

Grand theory, with one major expatiation Darwinism in its various manifestations - is unfashionable, while since (1984) influential overview, theories have themselves become more composite, and eclectic, one might almost say 'vague'. There is every reason to celebrate fiction, but what some people characterize as 'theoretical change', especially last forty years, has in fact been more like shifting 'concept metaphors' with areas of overlap and ambiguity between different paradigms. According to Moore, a concept metaphor is to 'maintain ambiguity and a productive tension between universal claims and specific historical contexts' (2004: 71), for example 'global', 'self', 'body', or (in science) 'mind', 'même', 'nature'. These are more tentative theoretical commitments, a kind of conceptual shorthand, stimulating thought; act as a descriptive gloss or posit causal forces that remain unexamined essentially suffering from under-theorization' (2004: 80). One could well what counts as theory in the humanities and social sciences has been of precisely kind.

Older Western ideas about nature's creatures were very different from Charles Darwin's theory of *evolution*, which suggested that different species developed, one from another, over long periods of time. In the 5th millennium B.C., the Greek philosophers Plato and Aristotle believed that animals and plants form a single, graded continuum going from less perfection to more perfection. Humans, of course, were at the top of this scale. Later Greek philosophers added the idea that the creator gave life or "radiance" first to humans, but some of that essence

was lost at each subsequent creation. Macrobius, summarizing the thinking of Plotinus, used an image that was to persist for centuries, the image of what came to be called the 'chain of being': The attentive observer will discover a connection of parts, from the Supreme God down to the last dregs of things, mutually linked together and without a break. And this is Homer's golden chain, which God, he says, bade hand down from heaven to earth.

Belief in the chain of being was accompanied by the conviction that an animal or plant species could not become extinct. In fact, all things were linked to one another in a chain, and all links were necessary. Moreover, the notion of extinction threatened people's trust in God; it was unthinkable that a whole group of God's creations could simply disappear. The idea of the chain of being persisted through the years, but philosophers, scientists, poets, and theologians did not discuss it extensively until the 18th century. Those discussions prepared the way for evolutionary theory. Ironically, although the chain of being did not allow for evolution, its idea that nature had an order of things encouraged studies of natural history and comparative anatomical studies, which stimulated the development of the idea of evolution. Others did not believe that species were fixed in their form. According to Jean-Baptiste Lamarck (1744–1829), acquired characteristics could be inherited and therefore species could evolve; individuals who in their lifetime developed characteristics helpful to survival would pass those characteristics on to future generations, thereby changing the physical makeup of the species. For example, Lamarck explained the long neck of the giraffe as the result of successive generations of giraffes stretching their necks to reach the high leaves of trees. The stretched muscles and bones of the necks were somehow transmitted to the offspring of the neck-stretching giraffes, and eventually all giraffes came to have long necks. But because Lamarck and later biologists failed to produce evidence to support the hypothesis that acquired characteristics can be inherited, this explanation of evolution is now generally dismissed.

By the 19th century, some thinkers were beginning to accept evolution whereas others were trying to refute it. For example, Georges Cuvier (1769–1832) was a leading opponent of evolution. Cuvier's theory of catastrophism proposed that a quick series of catastrophes accounted for changes in the earth and the fossil record. Cataclysms and upheavals such as Noah's flood had killed off previous sets of living creatures, which each time were replaced by new creations.

Major changes in geological thinking occurred in the 19th century. Earlier, geologist James Hutton (1726–1797) had questioned catastrophism, but his work was largely ignored. In contrast, Sir Charles Lyell's (1797–1875) volumes of the *Principles of Geology* (1830–1833), which built on Hutton's earlier work, received immediate acclaim. Their concept of *uniformitarianism* suggested that the earth is constantly being shaped and reshaped by natural forces that have operated over a vast stretch of time. Lyell also discussed the formation of geological strata and palaeontology. He used fossilized fauna to define different geological epochs. Lyell's works were read avidly by Charles Darwin before and during Darwin's now-famous voyage on the *Beagle*.

### Theory of Creation

Any theocratic society, irrespective of which religion the people practice, gives importance to the 'act of creation' in nature. Such society is profoundly influenced by a belief system which gives a theological understanding of creation. The theological notion of 'Creation' found in many religions or religious myths, which teach that a single God or a group of gods or deities are responsible for creating the universe. The idea that God is the only Creator of the Universe – a creation made from 'free will' and not out of necessity – is a basic tenet of the Roman Catholic Church. Judaism, Christianity, and Islam understand creation from the Book of Genesis.

Arthen (2008) observes that there are three commonalities amongst almost all different creation myths in the world: 1) the extraction of order from chaos, 2) the centrality of act, and 3) the resemblance between "creator" and "created." Among all creatures in nature, the creation of humankind is very significant and unique. The speciality of humankind is that they not only resemble the creator but also they possess culture!

Is humankind the creator of culture or the creature of culture? This assumption implies that a creator cannot be at the same time a creature of what is created (Dube, 1992). There is a reciprocal relationship and interaction

between human beings and culture. Considering the change and development happening around us the theory of creation reveals that there is a triangular relationship among the Creator, human kind and culture.

Hossain (2014) says that society's culture affects personality (individual) and, in turn, personality helps in the formation of society's culture. Thus, it can be stated that the relationship between society and individual is not one-sided. Both go hand in hand and interdependent on each other. The individual should be subordinated to society and the individual should sacrifice their welfare at the cost of society. But surely all is not harmonious between individual and society. Social integration is never complete and harmonious until resistance is tackled. Hence, resistance to change and development is understood as an outright denial and non-cooperation of humankind in interaction with culture. Although, theories of biological evolution deals with eternity, divine creation, spontaneous origin, catastrophism, uniformitarianism, cosmic origin of life, theory of Cynogen, theory of chemo-synthesis, theory of virus and theory of organic evolution.

### **Evolutionism**

The main protagonists of the theory evolution are Herbert Spencer and Charles Darwin. In general, the term evolution represents the process of gradual development. This is the process through which simple things, over the time, become complex. The English naturalist Charles Darwin, in his extraordinary classic titled 'On the Origin of Species' depicted the evolution of the biological organisms existing in the world. This work was published in 1859. This landmark work immensely influenced the then scientific community of that time. Another scholar Herbert Spencer (also known as an evolutionist and his works had huge influence in the American and the British Sociology) applied this theory to his explanation of the development of the society. According to Munch (1994; 35): "He combined the philosophical utilitarianism of his British compatriots Jeremy Bentham and John Stuart Mill with the organisms and evolutionism blossoming in his own days because of striking success of Darwin's evolutionary theory in biology". Though Spencer's theory had a huge influence during his lifetime, just after his death, these theories faced huge criticisms from the scholars of the new age. But the idea of evolutionism dominated for many years. Other than Darwin and Spencer, scholars like Tylor, Morgan, Bastain, Rrazer and some others are also considered as evolutionists (see also Nurazzura Mohamad Diah, Dewan Mahboob Hossain, 2014).

Darwin is mainly considered as a naturalist, Spencer is more renowned as a sociologist, E. B. Tylor and (British), L. H. Morgan(American ) anthropologist were all evolutionist and considered as the founders of the nineteenth century evolutionism got influenced by the revolutionary philosophical development of the nineteenth century. E. B. Tylor's famous contribution titled 'Primitive Culture' was published in 1871. If we concentrate on the world history of that point of time, we shall find out that in that particular era, English people were mainly concentrating on expanding their political territory through massive colonialism. As a result, many people like the travellers, explorers, businessmen, missionaries and several officials of the Government were visiting the different parts of the world. Tylor took the help of these people in preparing his thoughts and writings. Tylor (1903) gave an innovative all-embracing definition of culture: "Culture, or civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by (hu)man as a member of the society". Tylor proposed the idea of unilineal evolution. According to him, a society's evolution is unidirectional and it passes through three different stages one after another: the savagery, the barbarism and the civilization. According to Scupin and DeCorse (2012), Tylor assumed that hunter gatherers and other non-Western societies were living at a lower level of existence than the 'civilized' societies in Europe (Nurazzura Mohamad Diah, Dewan Mahboob Hossain, 2014).

Kuper (2018) analysed the pioneering figures of the neoevolutionist movement were Leslie White (1900–1975) and Julian Steward (1902–72). White was a unilinear evolutionist, who held that human beings had developed culture, a "superorganic" complex of tools and knowledge, armed with which they were bringing nature increasingly under control. As knowledge and technology increased, cultures generated more and more energy, which was the measuring stick of their progress. Steward, in contrast, characterized himself as a multilineal evolutionist. For him, cultures followed their own paths of development as they adapted to local ecological constraints (Ed. John Wiley & Sons, 2018). The evolutionary theory proposed by American anthropologist Leslie A. White (1900–1975) offers a materialist explanation of cultural evolution, but unlike Marvin Harris's cultural materialism a materialism that never

mentions the dialectical materialism of Karl Marx. This is intriguing, especially since White held socialist political views and allegedly wrote a column for the weekly paper of the Socialist Labor Party during the Depression and afterwards (for an overview of White's career, see Moore 2008). But beyond matters of political position, White's theory of cultural evolution was based on a very 20th-century American notion: technology is the solution to human problems.

### Diffusionism

Haviland, Prins, Walrath and McBride (2011) defined diffusion as 'the spread of certain ideas, customs, or practices from one culture to another'. Diffusionism as an anthropological school of thought started growing in the late nineteenth and the early twentieth century's (Ember, Ember and Peregrine, 2011; 20). Among the diffusionists, there are mainly two different schools: The British school and the German school. The British diffusionists like G. E. Smith and W. J. Perry were experts in Egyptology and they proposed that every aspect of the civilization (from technology to religion) actually originated from Egypt and later it got spread in the other parts of the world (Ember, Ember and Peregrine, 2011; Scupin and DeCorse, 2012). According to Ember, Ember and Peregrine (2011): "People, they believed, are inherently uninventive and invariably prefer to borrow the inventions of another culture rather than develop ideas for themselves". In their effort to clarify the fact that why some cultures do not possess any sign of the Egyptian culture, they said that 'some cultures have simply become degenerate' (Scupin and DeCorse, 2012). The ideas of Smith and Perry are no longer considered as valid and criticised from perspective of ethnocentrism and the question of treating Egypt as the origin of every culture.

One of the most prominent scholars of German diffusionism was Wilhelm Schmidt. Just like the British and the German diffusionists he also believed that humen are in general uninventive and try to borrow from the other cultures. But the German diffusionists did not believe that there is only one origin of culture (like Egypt). They believed that there used to be several cultural centers and cultural diffusion occurred from these different cultural circles. This German view of diffusionism is also known as *Kulturkreise* which means cultural circles. The American diffusionist school mainly led by Clark Wissler and Alfred Kroeber. Kroeber believed that diffusion always creates some change in the receiving culture.

Like any other schools of thoughts, the diffusionists also faced a lot of criticisms. Firstly, it could not come out of the ethnocentric ideology that some cultures are better than the others. Thus, again, the inherent inferiority of the non-Western people got highlighted by them (Scupin and DeCorse, 2012). Secondly, they could not give any convincing explanation of the fact why some cultures do not show any sign of the culture origins (like Egypt). Thirdly, though they take diffusion as an inevitable process, anthropologists found that 'societies can adjoin one another without exchanging cultural traits' (Scupin and De Corse, 2012; 284).

### Functionalism

The term 'functional anthropology' was invented by Malinowski in 1926 and was used by him as a label for his own research and teaching. Malinowski began his study of social anthropology in 1910 at the London School of Economics and one of his earliest published papers on the subject Australian aborigines. The notion of function itself was as old as recorded history. Herodotus, Plato, Aristotle, Augustine, Montesquieu, Hobbes and other social philosophers had recognized interrelationships between cultural institutions and used these in their explanations of society. Emile Durkheim used the concept of function in the methodological sense & also applied the same in concept 'Compound societies' Further, he applied the same in quasi-mathematical sense- every custom (part) of a community is interconnected with all (whole), so that each conditions the state of the others, from physiology-satisfy the individual's primary biological needs through the medium of culture and is the part it plays in maintaining integrity of the whole social system and proved that '**Function' an indispensable part.**

He used it as an assumption in his studies of Australian aborigines and Trobriand Islanders of Western Pacific and defined functionalism as that in every type of civilization, every custom, material object, idea and belief fulfils some vital function, has some task to accomplish, and represents an indispensable part within a working

whole. Culture is the major component which means for the satisfaction of human needs. Each trait or element or aspect of culture performs certain function and the vehicle through which human satisfied their needs. It is a system of objects, activities and attitudes in which every part exists as a means to an end. It is an integral part in which various elements are interdependent. Such activities, attitudes and objects are organized to perform important and vital tasks in an institution such as family, clan, the whole community, tribe, and the organized team of cooperation, political, legal and educational activity. From the dynamic point of view, as regards the type of activity, culture can be analyzed into a number of aspects such as education, social control, and economic system of knowledge, belief and morality and also modes of creative and artistic expression. Malinowski developed a theory of need in his book, published after his death, entitled, 'Scientific Theory of Culture and other Essays. He defines need as the system of conditions in human organism, in the cultural setting and in relation of both to the natural environment, which are sufficient and necessary for the survival of group and organism. He distinguishes three levels of need which are as follows: Primary or basic or biological need, Instrumental need or derived need and Integrative need.

Functionalism is not only a theory to study culture but also a method of explaining social events and institutions by delineating the functions they perform. The limitations of the theory listed out were that it provides explanation only for the known and observable facts. His theory is based on the idea of universal organization into which human beings in all societies enter for satisfying their needs. According to him, Institution is the microcosm of culture and any aspect of culture, describes the cultural responses satisfying to various derived and integrative needs and societies are working in a given manner. The criticism posed was on the terminological confusion when he used terms, i.e. 'biological' or 'primary' as synonyms and not being consistent with regard to the terms used for all the categories of needs. He has also not given explanation as to why he uses the term 'imperative' for the integrative category of needs. It is failed to throw light on the effect of colonialism, fails to state explicitly the relation between certain needs and survival of individuals and groups. It does not include such needs which emanate solely out of 'social appetite' of individuals and groups. He has tended to believe that form is determined by function. But it is not only the function, but other factors such as material, technique; skill, volition etc. also influence the form. Finally Marxist theory underwent revival at the end of the colonial era.

### **Structural Functionalism**

Structural functionalism is a variety of functionalism that came to the fore in social anthropology and sociology during 1930s, 1940, and 1950s. Structural functional direct roots lie in Durkheim's work. The main focus is on forms of social structure and on the functions of institution and customs for the social systems. Radcliffe-Brown was the key figure in this theoretical development and he attracted scholars who were dissatisfied with Malinowski's more general functionalist formulations. They found that the approach provided by Brown giving more fruitful possibilities particularly for comparative research in the field of kinship, marriage and politics of law. The structuralism approach was mainly criticized by Marxists and others by putting the arguments that it appears in retrospect and unnecessarily polarizing.

### **Structuralism**

Structuralism emerged with curious combination of an ethical-moral ideological system and a scientific epistemological theory of culture and "nothing more than a method in need of deductive-inductive implementation in order to achieve the status of a fully-fledged scientific method in the socio-cultural domain. (Prattis, 1972.) Levi Strauss's structuralism has received a stimulus from recent critical contributions from either side of the Atlantic (Ardener 1971; Nutini 1971). The views of Ardener and Nutini on the place of structuralism in the development of science are discussed. Nutini's discussion implies that the ideological basis of Levi-Strauss's structuralism prevents him from being a good scientist (1971:540), while Ardener raises the prospect that structuralism may yet? Shake up philosophy of science (Prattis, 1972.)

Lévi-Strauss concedes the need for a stronger conception of the role of history to supplement structural anthropological analysis, and offers a more tempered account of the relation of history and structure, which seems to mirror Sartre's notion of the progressive-regressive method. The linguists have taught that every system - linguistic or otherwise - is in constant dis-equilibrium with itself, this is the motor of its internal dynamism. But, in addition to

this, there are other things, which we can never reduce that is history, something absolute in front which we must accept (Jacob Rump, 2011).

### **Culture and Personality**

Generally, the postulates of the culture and personality school were worked out during 1940s and 1950s (Gorer 1943; Kardiner 1945; Benedict 1946; Wallace 1952; Whiting and Child 1953) and the universal generalizations advanced were seemed to make it possible to connect and interrelate the past and the present, motives and institution, parents and god. Typically, investigators of culture and personality have sought linkages between social institutions and symbolic systems, on the one hand, and personality variables on the other. In recent years the links have weakened, in large part because a pattern of evidence and theory has emerged that seriously questions the relevance of the concept "personality" as it has been applied in culture and personality. The implications of this pattern of evidence and theory are often negative and sometimes severe, especially for any approach to behaviour that emphasizes "genesis" (origins in early experience) and/or "typology" (the classification of individual or cultural differences). For years, personality psychologists have searched for generalized consistencies in the way people differ from one another in their feelings and social behaviour across diverse contexts and proved that method variance was greater than person variance.

Cultural integration analysis, postulate that it was difficult to assess and very little systematic evidence on the extent of thematic generalization evolved across domains such as the domestic, the economic, the political, the religious, etc. It is certainly the impression of some ethnographers (Geertz 1973:406-407) that within any culture for every theme has its "subdued opposite" and it was certainly the impression of the writer who portrait 'culture', intimately related to the methods one uses to study the culture. There are, however, two studies worth mentioning; Mead's national character substantiate that the way cultures differ from one another cannot be generalized from one domain to another and also impressions and intimations do not make science. At this juncture the degree of thematic generalization at the cultural level cannot be judged with confidence and one can only look forward to more systematic research on cultural integration. Another is Kardiner's Basic Personality Structure provides a key concept to understand phenomena of culture change from the static to the dynamic aspects of culture. In other words, it gives explanation for the condition lie in the compatibility or incompatibility of the new patterns with the already established personality structure of the society. The author says that the borrowed culture always undergoes some modification in form in the course of their integration into a new culture; the most extensive change is likely to be in meaning. It is evident that the concept of a societal basic personality structure provides the anthropologists qualities of human beings with a new tool which has important possibilities. It will enable the researcher to organize data of certain sorts in a new and significant way and may even provide with the ability to predict in very general terms, the reactions of a given society to a given innovation.

### **Postmodernism**

An influential new movement has emerged in philosophy in the past thirty years which has come to be known as Postmodernism. Some believe that the term "Postmodernism" is ambiguous and hard to define, and it is true that it is often used in a number of ways which bear little relation to the postmodernist movement in philosophy. For the postmodernist approach to knowledge is also dominant in a variety of disciplines, especially literature, history, theology, feminism, and multiculturalism suggest that everything in these disciplines is defined by postmodernism (Sweetman, 1999). Postmodernism emerged as a movement and central theme is the critique of objective rationality and identity. The implications of this critique also posed the very central question of 'structure' in philosophy, literature and culture. Postmodernism or Post structuralism evolved as a philosophical theory about the nature of knowledge, and the ability of the human mind to know reality. The philosophical basis of postmodernism raises the most important question on interpretations and if these question ignored, or treated superficially, then the very application of postmodernist ideas to philosophical issues and texts, to questions and issues in other disciplines, and to social, political and educational agendas will be greatly undermined.

Western philosophers have been mistaken in their belief that being is presence, and the key to understanding presence is something along the lines of substance, sameness, identity, essence, clear and distinct ideas, etc. For, according to Derrida, all identities, presences, predications, etc., depend for their existence on something outside themselves, something which is absent and different from them. All identities involve their differences and relations; these differences and relations are aspects or features outside of the object-different from it, yet related to it yet they are never fully present. Reality itself is a kind of "free play" of difference (a new term coined by Derrida); no identities really exist (in the traditional sense) at this level; identities are simply constructs of the mind, and essentially of language.

The postmodernist although they came to inspire some literature, and to dominate its interpretation in academic circles, was actually rooted outside the arts. Barthes was mainly interested in the application of linguistic models to the interpretation of text, Derrida's philosophical work began as a critique of linguistics, and Foucault's base was in the social sciences and history. They were also all guided to a greater or lesser degree by the re-reading or redemption of Marx (whose dominance in places like the Soviet Union was, before 1989, rather airily explained away as due to a misapplied 'bureaucratic socialism'). Most of the French intellectuals responsible for the theoretical inspiration of postmodernism worked within a broadly Marxist paradigm.

Postmodernist doctrines thus drew upon a great deal of philosophical, political, and sociological thought, which disseminated itself into the artistic avant-garde (particularly in the visual arts) and into the humanities departments of universities in Europe and the United States as 'theory'. The postmodernist period is one of the extraordinary dominance of the work of academics over that of artists (Butler, 2002). However, the fact remains that postmodernism trying to break the theory of monotony and encouraging alternatives with all constructed generalisations for centuries in understanding the social, cultural, economic and the political problems by applying more of phenomenological approaches.

### **Theories, Methodology, & Methods**

Theories imply methodology but are not quite the same thing, the terms 'theory' and 'methodology' are regularly used to mean different things to different people (Ellen, 2010) Methodology is the systematic study of the principles guiding anthropological theory, investigation and the ways its application established and thus, we speak of Marxist methodology, ethno-methodology, or even Darwinian methodology. It is both a branch of philosophy that analyses the principles and procedures of inquiry in a particular discipline, and also the system of methods used in a particular discipline (Moore 2004: 75). Methodology has also become synonymous for many with specific 'methods' or 'techniques' and in the context of anthropology methodology, is sometimes reduced to participant observation.

Methodology and method are, therefore, conceptually distinct, but implicationally mutual and pragmatically overlapping. So that, theory is an explanatory framework, a body of systematic suppositions derived from observation, more susceptible to hypothesis-testing, one of several alternatives that can be used to gauge its explanatory utility, and implies a methodology but not a method. Theory cannot be reduced to a set of a priori assertions and it has to be carefully selected in relation to the problem at hand, and just because its short-term novelty might have worn off is no reason to discard it completely. Good theory builds on the past, rather than mechanistically or rhetorically subverting it (Ellen, 2010).

Edmund Husserl explain how and why theories was originally developed when individuals gave meanings to social phenomena in their everyday lives as per their cognitive perspectives and leading variations in arriving common premises. The role of phenomenology was therefore to explore "the essence of consciousness as experienced from the first-person point of view. Studies that draw upon this theoretical perspective concentrate on exploring how individuals make sense of the world in terms of the meanings and classifications they employ. As such, phenomenology aims to provide accounts that offer an insight into the subjective "lived" experience of individuals and given the emphasis. Phenomenological studies do not attempt to generate wider explanations; rather



their focus is on providing research accounts for the respondents in a specific setting and arrived generalisations or theories.

Theories and methodologies are historically related and socio-political, both may derive from the same discipline or schools or some time from other discipline and although they are sometimes used separately they are supposed to be taught and used together. The link between interactionism (theory) and ethnography, have been justified by the empiricist (Scott Reeves, Mathieu Albert, Ayelet Kuper and Brian David Hodges, 2008) with multiple methodologies like; critical theories, grounded theory, PRA, PAR of varying effect with almost every available methodology both qualitative and quantitative.

Qualitative research, and the various methodological approaches associated with it, is often founded on an explicit rejection of positivist epistemology. The Positive epistemological rules placed great emphasis on the use of ordered, measurement-oriented, and reproducible methods of inquiry underpinned by systematic doubt and detachment. Thus, forms of empirical inquiry whose proponents wish to advance a claim that their results lead to knowledge are obliged to follow the rules of the scientific method or provide alternatives to positivist science (Avis, 2003). But the phenomenological approach and the Grounded theory offered different accounts of inquiry, and emerged with scientific theories which could explain and predict facts of the observed data (Haig, 1995). Every evolving scientific person should clarify the frame work for the proposed research, evaluating its quality founded on epistemology, methodology, and method. They should define the elements, its respective contribution, and interrelationship of parts with the whole (Carter and Little 2007). There are three fundamental facets of research-epistemology, Methodology and Method – provided framework for planning, implementing, and evaluating the quality of qualitative research. Qualitative research the data is in the form of text rather than converting them to numbers for analysis, aim to understand the human action (Schwandt 2001).

Epistemology is “the study o nature of knowledge and justification” (Schwandt 2001, p. 71) and epistemological issues are “issues about adequate theory of knowledge or justificatory strategy (Harding 1987, p.2). In brief epistemology can be thought of as justification of knowledge. A methodology is defined as “a theory and analysis of how research should proceed” (Harding 1987, p.2), “analysis of the assumptions, principles and procedures in a particular approach to inquiry” (Schwandt 2001, p.161). or the study- the description, explanation, and the justification of method, and not the method themselves. In short methodology provide justification for the methods chosen for research. Methods are techniques for gathering evidences, procedures, “tools and techniques” of research. Methods can be thought of as research action. In simple term methodology justify method, which produces data and analyses. Knowledge is created from data, and analyses. Epistemology modifies methodology, and justifies the knowledge. The way in which empirical researchers turned into theoreticians and established theories, sustained as per the time and space eventually. Every facets of these component work as a part to achieve the understanding of human action as a whole in the society lives.

### **Logics of Qualitative Research**

Over decades’ methodologists have articulated a number of distinct strategies for approaching qualitative research: a set of reconstructed logics of qualitative research. Consistent with other writers (Harding, 1987; Schwandt, 2001), we refer to these reconstructed logics, the product of methodological work, as methodologies. These methodologies justify the methods used in qualitative research. Thus includes; grounded theory approaches (Charmaz, 2006; Clarke, 2005; Glaser & Strauss, 1967; Strauss & Corbin, 1998); narrative, life history, testimonial, and biographical methodologies (Beverley, 2000; Hurwitz, Greenhalgh, & Skultans, 2004; Lieblich, Tuval-Mashiach, & Zilber, 1998); various ethnographies (Carspecken, 1996; Hammersley & Atkinson, 1995; McCall, 2000); participatory action research traditions (Dick, 2003; Kemmis & McTaggart, 2000); various phenomenological or phenomenographic traditions (Giorgi, 1985; Moutsakas, 1994; Valle & Hailing, 1989); and case study approaches (Stake, 1995; Yin, 2002).

Ethnography is a concept, method and approach in Anthropology. Anthropology is a discipline emerged with colonial constructions, so as the concept too. Validating ‘Ethnocentric’ perspective American Anthropological

Association published enough on the issue periodically. James Clifford & Marcus; "*Writing Culture*" is the most thorough and penetrating interpretation to date of ethnography as literature. In social scientists of every persuasion will want to thoroughly consider the ideas raised in *Writing Culture*; they cannot afford the luxury of doing otherwise." (Jean-Paul Dumont, 1986).

*Writing Culture* argues that ethnography is in the midst of a political and epistemological crisis: Western writers no longer portray non-Western peoples with unchallenged authority; the process of cultural representation is now inescapably contingent, historical, and contestable. Ethnography acting as an authoritative perspective in the postmodern world system. They challenge all writers in the humanities and social sciences to rethink the poetics and politics of cultural models/designs.

Design anthropology represent an important milestone in the creation of new and important field of artistic and intellectual inquiry both anthropologists and designers have great advantages. They masterfully illuminate the territory between anthropology and design by weaving together a wide range of voices in to rich narrative and it becomes an essential read for anyone interested in the intersection of anthropology and design. The gap between designers and anthropologist, describing how to create collaborative innovation networks to build interdisciplinary pathways between the yin and yang of innovation (Miller, 2018).

The anthropologist of artificial intelligence (AI) is new emerging scientific discipline which has a computational social scientist with self-described "maverick" tendencies. The rapid rise of artificial intelligence technology had generated new question about the relationship between people and machines which they had set out to explore. Recent advance in AI are leading to increasingly autonomous systems assessing (potentially future) human behaviour for profiling individuals and executing decisions from the *social assessments* with often far-reaching consequences for the assessed subjects and for society at large.

The fundamental idea was that culture should be treated as a symbolic discourse. The ethnographer was trying to grasp meanings, not speculate about functions. Translation and exegesis, not explanation, was the goal. "Doing ethnography is like trying to read in the sense of 'construct for are adding manuscript'". Geertz's wrote, and this text was "written not in conventionalized graphs of sound but in transient examples of shared behaviour." Interest in the other society, and hence in the multiplicity of forms of human life, is shared by two distinct classes of knowledge: namely, anthropology and utopia. For centuries, these two kinds of understanding of the socio-cultural sphere of reality were interwoven, at times so tightly that they were virtually indistinguishable. Today, they appear not only disparate but even opposed, for it is commonly held that utopia pertains to the unscientific domains of fictional literature and political ideology. However, the intrinsic connection between these two types of knowledge is being rediscovered and is generating a reciprocal interpellation that is fruitful for both cognitive traditions. Anthropology and utopia both use the category of "alterity"; though they do not use it in the same sense, the senses mutually complement one another ([Esteban Krotz](#), 2018).

Every school of thought, while studying the key subject matter 'culture', its layers of universality paved by every empiricist to evolve as methodologists, theoretician and theoretical practical person by understanding the observed reality of the human issues and sustained discipline's survival. Especially in anthropology, we strongly believe in the scientific principles of every culture trait, keeping the space and time into considerations. Similarly, the basic principles of anthropology; like ethnocentrism, holistic approach, historical particularism, cultural relativism and the concept of part and whole could never ever be in a position of compromise, might itself in an upholding position in the process of anthropological growth. Theoretical knowledge enhances through empirical research and vice versa and which in turn be possible for applications and can be called theoretical practical knowledge. The clarity in theories and methodologies leads comprehensiveness of one's cognition and made application relatively tangible. Once theoretical practical knowledge generated, there is no limit integrating with any genre in the world which is culture, the reality of human. Hence, every theories and methodologies should be perceived as a 'part' and these 'parts' facilitate every budding anthropologist to suit themselves to study the contemporary changing 'culture' with complexities as a 'whole'.

As a student, as a young researcher, as a young teacher, as a senior ethnographer, as a stakeholder, as anominated authority for the community appellat, I have been in the field of anthropology and felt that

anthropology could relate everything on the earth. Society, culture, and community are our everyday reality, yet we do not understand much about these institutions, may be by virtue of living within such institutions, we take these institutions for granted. The social sciences theorists have been evolving 'theories' periodically through their grounded intellectual currents and validate the scientific understanding of the institution as concepts, and theories. The emerging new concepts and theories provide relatively better understanding than the fading older ones. Such efforts in academia strengthen, the understanding of the ground reality of socio-cultural issues, clarity about the complex evolving problems along with changing institutional structure, applied oriented/ culture specific problem solving mechanism, the effective policy construction, the sustenance of respective discipline and demonstrate its contemporary relevance. Though Anthropology has been perceived as a latecomer in the Social Sciences basket, its subject matter and the unique research principles provide scope in every changing school of thought and justify the components of 'culture'.

There are many popular concepts and theories in social sciences, humanities, linguistics, management, computational social sciences, and others which have validated the relevance of the grand concept of 'culture'. The functionalist proposed concept of 'part and whole' and its integration with physiological, cosmological, structural, psychological, and post-modernism principles is well established. A spirit of multidisciplinary approach/method has surfaced through the concept of 'part and whole' perspective, appreciating 'grounded theories'. Anthropology, with its strong theoretical base, inculcates the values of acceptance and appreciates the 'others' in theories, methods, and application. The emerging concepts like 'new/auto/ethnography', engaged, experimental, integrative and such other approaches open new horizons, providing theoretical sustainability for anthropology.

### Conclusion

This paper compiles the author's three decades of research on the occurrence of alternative realities, open-ended epistemology, and 'theoretical-practical' interpretation, patterned with enough validating the contribution of anthropology. Further, each discipline must preserve its knowledge—and its territory or "turf," if you will—in specific institutional forms and perpetuate those institutions over generations. Such *alternative social construction of knowledge* opens up the process of creation, innovation, perpetuation, transmission, and institutionalization of academia and also enhances passion towards one's own discipline.

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#### 04. BIOLOGICAL OR LIFE SCIENCE

##### 0304020 PUTTARAJU, H P (Department of Life Science, Bangalore University, Bangalore-560056). WOLBACHIA BASED CONTROL OF INSECT PESTS AND DISEASE VECTORS

Mankind is posed with several difficulties from the insects as they are potential vectors for several deadly diseases and also causes severe crop losses due to pests. Conventional strategies of controlling insect pests and disease vectors through physical, chemical and biological methods have achieved little success so far. Thus the modern approaches of using molecular biology and biotechnological tools have come to the forefront. *Wolbachia*, an endosymbiotic bacterium which dwells in the reproductive and somatic tissues of insects and nematodes has been currently exploited for control of insect pests, vector and filarial nematodes. Recently the endosymbiont was successful in controlling Dengue and Chikunguniya in Australia and the research work was also nominated among the top twenty research areas in Science for Nobel Prize.

*Wolbachia* are a diverse group of intracellular bacteria that show impressive adaptations towards living in invertebrate cells and in manipulating the biology of their hosts. Considerable progress has been made in the past 10 years to elucidate their biology. There has also been growth in the *Wolbachia* research community, particularly in the areas of genomics, cell biology and molecular biology. It is estimated that *Wolbachia* can be found in between 75% of all insect species and the default mode of transmission is vertical, from mother to offspring, but host and symbiont phylogenies often indicate that horizontal transmission occurs frequently enough over evolutionary time to prevent co-cladogenesis. Upon probing the role of the Endosymbiont in their insect host's several fascinating relations ranging from 'reproductive parasitism', 'commensalism' to 'mutualism' have been discovered. This 'ace reproductive manipulator' affects host evolution, causing sexual selection sex determination and speciation. *Wolbachia* can be used to directly suppress arthropod populations or as a vector for expression of transgenes or as a tool to drive desirable genotypes into arthropod populations. A number of new research tools are in place for example, culturing of *Wolbachia*, a multilocus strain-typing system genome sequencing and transfection into novel hosts.

Prof. H. P. Puttaraju and his research group from Bangalore University was the first to introduce *Wolbachia* research in entire Indian sub-continent. Currently the research group is actively working on three major aspects of *Wolbachia* research i.e. *Wolbachia* Genomics, Proteomics and Transfection studies. The preliminary works by the research group underlined Host-endosymbiont interactions and unraveled several reproductive anomalies which have been published in several National and International Journals.

The current talk emphasizes the entire *Wolbachia* research, its importance to the current scenario and the research activities of the group. It would focus on how the pests and vectors can be effectively controlled for the benefit of mankind.

## 08. COMMUNICATION AND JOURNALISM

### 0308021 ARAM, I. ARUL (Department of Media Sciences, Anna University, Chennai). TRENDS OF DEPICTING GLOBAL WARMING IN NEWS

Climate change – or its synonym ‘global warming’ – does not fit into the journalistic principles of news worthiness, timeliness and brevity. Professionalism in journalism has shrunk due to financial pressures the media faces. Added with it is the journalistic principle of balance. Journalists tend to balance one with the other – just like balancing ruling political party news with that of the opposition party. This means, sometimes journalists covering climate change balance pro-climate change news with stories from climate skeptics. This would almost amount to balancing science with non-science – so to say, sense with non-sense. Scholars talk of “balance as bias”, “false balance” or “false equivalency”. Even while covering climate change, journalists are fascinated towards the political conflicts related to the issue. Studies have found that skeptical voices are prevalent in U.S., U.K. and Australian (Anglophone) media while countries ranging from China and Japan to Brazil, Germany, Spain and Norway see little skepticism. Even the Indian media, by and large, is of unanimous view that climate change is real. When the then Chairman of the Inter-governmental Panel on Climate Change, Dr. Rajendra Pachauri, came in for criticism over the report on the fast melting of the Himalayan glaciers in 2010, the Indian media supported him. Although journalists and scientists profess to pursue ‘truth’ and have similar professional rigour, they come in conflict with each other in the way they practise the ‘truths’.

**Keywords:** Media, journalistic principle, climate skeptic, scientist, news.

#### Introduction

"Function of news is to signalize an event, the function of truth is to bring to light the hidden facts, to set them in relation with each other, and make a picture of reality on which men can act," says Walter Lippmann (1922). What Journalism can be broadly defined as any news or views in news media which are of interest to a good number of people. The media is still the main source of information and opinion for millions of readers and viewers, through newspapers, magazines, television, radio and the internet. The internet (social media in particular) has redefined journalism as diverse content gets generated by the public too, and this, in turn, is taken note of by the mainstream media. Further, the media mediates news for the public. The media also simplifies the complex phenomenon of climate change.

Journalists often rely on press releases and promotional materials which do not attract the attention of media consumers. On the other hand, when journalists take initiatives to cover climate change news, scientists dislike the journalistic approach to the stories. Journalists are expected to speak in definite terms but climate science is not definite in many cases. This paper looks at issues that affect climate change stories in the media, with special respect to India.

#### Himalayan Blunder

The erroneous news about the quick melting of Himalayan glacier came to be known as a ‘Himalayan’ blunder. Himalayan glaciers should arouse such peculiar passion because they have long been a central icon in global warming campaigners' propaganda. Everything that polar bears have been to the West, the ice of the Himalayas has been to the East. Nobel prize winner Al Gore emphasized, in his Oscar-winning film *An Inconvenient Truth*, that the vast Himalayan ice sheet feeds seven of the world's major river systems, thus helping to provide water to 40 per cent of the world's population.

The Inter-governmental Panel on Climate Change (IPCC) based its offending paragraph in an interview Dr. Syed Hasnain gave to the popular science magazine *New Scientist* in June 1999. It was in that year that Dr. Michael Mann in the U.S. launched his famous "hockey stick" graph, purporting to show that temperatures had risen faster in the late 20<sup>th</sup> century than ever before in the Earth's history. The graph was made the centre-piece of the IPCC's 2001 report. Dr. Hasnain's interview with *New Scientist* was quoted in a 2005 report by the environmental

campaigning group Worldwide Fund for Nature (WWF). So it was this, rather oddly, which the IPCC cited as its authority – a material without peer review.

The year after the IPCC report was published in 2007, however, Dr. Hasnain was recruited by Dr. Rajendra Pachauri [who headed both IPCC and TERI, at that time] to head a new glaciology unit at The Energy Research Institute (TERI). In a matter of months, TERI was given a share in a \$500,000 study of melting Himalayan glaciers by a U.S. charity, the Carnegie Corporation. It is clear from Carnegie's database that a key part in winning this contract was played by Dr. Hasnain's assertion that most glaciers in the region will vanish by 2035 as a result of global warming. The error is attributed to a typo and it should be 2350.

In 2009, the media was continuously attaching the suffix “gate” to all controversies and scandals relating to climate change that were being uncovered one after the other i.e. (the Climate-gate, Amazon-gate, WWF-gate). In its original, a burglary at the Washington office complex called the Watergate, in June 1972, grew into a wide ranging political scandal that culminated into the resignation of American President Richard Nixon two years later. This feels like the media was expectant to pull another “Watergate” and pressure Dr. Pachauri to resign and get the U.N. to disband the IPCC. Backers of this were carbon-based industries too. Some of the headlines in the Western newspapers read thus: "Your £10m backing for climate guru", "World misled over glacier melt", "The real story behind Glacieregate row," and "Climate watchdog in new blunder". However, Indian newspapers were favourable towards climate change news in general and Dr. Pachauri in particular. When Dr. Pachauri came in for criticism over the report on the fast melting of the Himalayan glaciers, the Indian media supported him tactically. Given below are some examples of newspaper stories during that period.

*The Deccan Chronicle* reported: “For the average Ladakhi, water supply from glacial melt is on the decline. Ninety-two year old Phuntchok Namgyal from Stakmo said that he did not need a scientist to tell him about global warming”.

*The Times of India* said: “While these cases prove that supranational agencies are not without flaws, science itself is not the villain. Most scientists accept that Himalayan glaciers are melting. It is only the degree of the recession that is under dispute”.

*The Hindu* (reproducing a *The Guardian* story) said: The fact that Himalayan glacier is less studied because the region falls in the conflict zone between countries and scientists are not used to such high altitude low temperature to gather data, can be excuses for the error.

*The New Indian Express* reported: “We have full confidence in Chairman of IPCC,” Environment and Forests Minister Jairam Ramesh said during Question Hour in the Rajya Sabha. "India's objections to the report were upheld and we were vindicated," he said. "We are backing IPCC Chairman (Pachauri) and will fight any attempt to unseat him," the Minister said.

### **Cyclones and Climate Change**

Although it would be impossible to say that global warming caused any single tropical storm, the increase in air and water temperatures undoubtedly increases the evaporation and energy in the climate system. The devastation from the tropical storms (cyclones) event provided a news hook through which many journalists explored the complex nexus of natural forces and human influences. Storm surges along the coast of India result from tropical storms that form over the oceans. Tropical storms could be very destructive.

Tropical storms have different names around the world depending on the place of occurrence. For example, the name "hurricane" is given to systems that develop over the Atlantic or the eastern Pacific Oceans. In the western North Pacific and the Philippines, these systems are called "typhoons" while in the Indian and South Pacific Ocean, they are called "cyclones".

The 1999 Supercyclone that had landfall in Odisha was an eye-opener to the changing climate. In the cyclone, around 30,000 people lost lives, one million people got displaced, 3,70,000 cattle died. However, official death toll was put around 10,000 with the migrant population particularly from Bangladesh unaccounted for. With the massive death of cattle, returning to normal life with livelihood intact got delayed.

In 1999/2000, Mozambique was hit by a series of cyclones. And 700 people dead, 1 million displaced. The city of Xai-Xai the Limpopo river waters were 12 feet deep for nearly a month. “The world had never before on TV seen a woman give birth to a child in a treetop...never before had TV shown such spectacular rescue”. Even the 2015 Chennai floods were attributed to climate change; the then Indian Environmental Minister who first said that the flooding is not due to climate change had to retreat his statement.

But still some scientists are not categorical about link between cyclones and climate change. For instance, major cyclones are now occurring in the north of the Bay of Bengal, and the sort of severe cyclone that devastated Dhanuskodi in Tamil Nadu in south India in 1964 no more recurs.

### **Impact on People**

To better understand climate change, it is important that one has an understanding of what it means to different people in different parts of the world. Challenges include making stories more relevant to audiences, raising the profile of adaptation and the perspectives of the poor, and reporting on the ways to address climate change that bring additional benefits.

Lack of environmental and scientific training is a major reason why climate change is not well covered. Climate change is a technical subject where calculations and forecasts are made; there are hardly any trained people in the media to handle it in an understandable way.

Journalists may tend to remove the uncertainty from information that scientists report, may not report a complete or comprehensive story, transform provisional findings into certain findings, and have trouble balancing opposing sources. The probabilities are changed into certainties. Scientists want journalists not to oversimplify or hype the latest findings but to do this without underestimating the climate risks. Although journalists and scientists profess to pursue ‘truth’ and have similar professional rigour, they come in conflict with each other in the way they practise the ‘truths’.

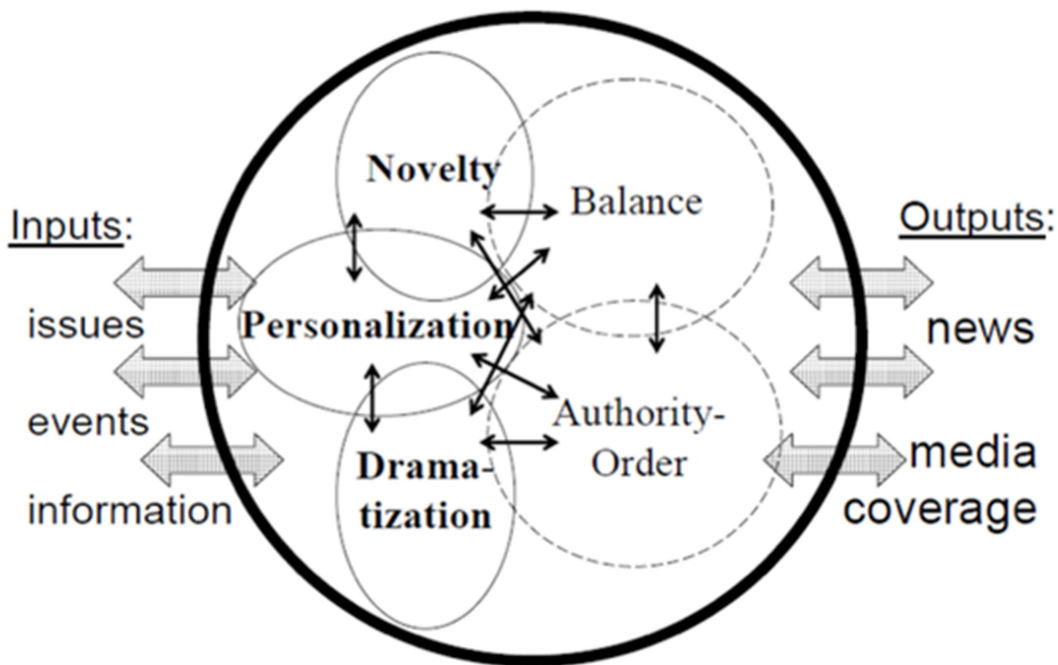
### **Conflict with Journalistic Norms**

Climate change does not fit into the journalistic principles of newsworthiness, timeline and brevity. Professionalism has shrunk due to financial pressures the media faces. Journalism often relies on press releases and promotional materials which do not attract the consumers. Journalists should “go to the field”, and not make stories from home, office or relying on the internet which degrades the quality of reporting. News may be mediated by civil society, and there again, journalists may look for a fresh angle.

Much of the media has done a particularly bad job covering the climate crisis. Instead of informing the public about the facts, they have treated the issue as if the same political divisions they exuberantly cover also exist in the scientific community. They do not (Al Gore, 2010). The trend is to balance pro-climate change stories with those of climate skeptics. Climate change as such does not fit into the journalistic principles of 'news worthiness', 'timeliness', 'balance' and 'brevity'. Professionalism in journalism has also shrunk due to financial pressures the media faces. Added with it is the journalistic principle of 'balance'. Even while covering climate change, journalists are fascinated towards the political conflicts related to the issue. Or else too, journalists generally balance one with the other – just like balancing ruling political party news with that of the opposition party. This means, sometimes journalists covering climate change balance pro-climate change news with stories from climate skeptics. This would almost amount to balancing science with non-science – so to say, sense with non-sense. Scholars talk of “balance as bias”, “false balance” or “false equivalency”.



Further, as Fig. 1 of Boycoff and Boycoff (2007) shows, climate change as a news story may be framed as personalization, dramatization, novelty, authority order or balance.



**Fig. 1 Interacting journalistic norms**

The reporter and audiences' identities and relations seem to be based on the entertainer-consumer model and the audiences are addressed as consumers who are to be entertained. Despite all these, the Indian media, by and large, is of unanimous view that climate change is real. Studies have found that skeptical voices are prevalent in U.S., U.K. and Australian (Anglophone) media while countries ranging from China and Japan to Brazil, Germany, Spain and Norway, see little skepticism (Painter & Ashe 2012), the latter just like India.

#### **Nature of TV Coverage**

Photographs on newspapers and visuals on television evoke greater impact among the viewers in perceiving the message. Television reports mainly for sensationalism and it hypes up the stories during controversies. Or, the story is sensationalized in terms of alarmist reporting (eg. glacier melt). Television is known for sound-bite short stories, and every story is treated independently. Thus, there is no consistent editorial line on television which mostly prevails in newspapers. One time, a TV story may say that increasing occurrence of coastal erosion is due to climate change, but at another time quoting other scientists an angle may be taken that the occurrence of the erosion has nothing to do with climate change as had been made out. With extensive competition from other channels covering the same news story, it is necessary for the media to approach the story from different angles to keep the viewers rooted to a channel. This does not mean contradictory stands on the same issue.

#### **Challenges Faced**

*The Guardian's* Alan Rusbridger (2015) was the first major newspaper Editor to campaign against climate change through the newspaper columns. He wrote, "There may be other extraordinary and significant things happening [vis-à-vis climate change] – but they may be occurring too slowly or invisibly for the impatient tick-tock

of the newsroom or to snatch the attention of a harassed reader on the way to work. . . . We will look at who is getting the subsidies and who is doing the lobbying. We will name the worst polluters and find out who still funds them. We will urge enlightened trusts, investment specialists, universities, pension funds and businesses to take their money away from the companies posing the biggest risk to us. And, because people are rightly bound to ask, we will report on how the Guardian Media Group itself is getting to grips with the issues." Here again, the newspaper did not much focus on the individual carbon footprints. A tactical stand is taken by even the best of the newspapers in covering climate change by targeting the fossil fuel lobby but not the carbon-intensive lifestyle of the people who are their readers.

There is a need to combine technical expertise with communication approaches. There is a need to fuel the trend of increasing media coverage of climate change. There is also a need to increase the quality of coverage. For journalists new to the topic, climate change is complex, thus training journalists to cover and deal with this issue must be made a priority for media outlets. Journalists feel constant pressure to compete with all other news for time on the air or space on the front page. It may so happen that reporters without proper skills to report knowledgeably on the process of science and scientific uncertainty may involuntarily exaggerate on the issue.

The media needs to provide more coverage of climate change impacts on many aspects of daily life, such as tourism, sports/recreation, local government, health, business, agriculture, forestry, and education. Such a holistic approach will get better reception.

Although journalists and reporters are pressured to offer stories that are unique and individual they must be presented in a way that they are no less valid scientifically. To achieve this, they should not over rely on press releases and instead invest the necessary time to understand original documentation and travel to places. Journalists need to take care when reporting on uncertainty regarding climate change. They need to be qualified enough to differentiate unfounded controversies from genuine scientific disagreements among qualified experts, and present them legitimately. Both scientists and journalists need to be sensitized on the ways to address climate change, as the media mediates the science of climate change to the larger public.

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## 11. ECOLOGY AND ENVIRONMENTAL SCIENCE

### 0311022 NANDINI, N (Department of Environmental Science, Bangalore University, Jnana Bharathi Campus, Bengaluru). WATER RESOURCES, ISSUES AND ITS SUSTAINABLE MANAGEMENT IN BANGALURU, KARNATAKA

Bengaluru city is located at an average elevation of 900 meters above Mean Sea Level. Bengaluru lies between the watershed of three principle river basins- Arkavathi to the west, Vrishabhavathi to the south and South Pennar to east. The undulating terrain of Bengaluru, with its hills and valleys provides a very natural drainage pattern with small streams originating from ridges cascading down to form major streams in the three major valleys, Hebbal valley, Koramangala-Chalaghatta valley and Vrishabhavathi valley. Lakes are important part of urban ecosystem. Lakes perform significant environmental, social and economic functions, ranging from being a source of drinking water, recharging groundwater, acting as sponges to control flooding, supporting biodiversity, mitigating regional warming and climate change and providing livelihoods.

Arkavathi River being the vital source of drinking water for about a million population of Bengaluru city. Rapid growth of Bengaluru city and urbanization around the city has put stress on mobilization of the water resource. Hence, the quantity of the water flowing into Thippagondanahalli Reservoir (TGR) and its quality are significant from the point of sustenance of the TGR. As different types of activities in the catchment area determine the quantity and quality of the water reaching TGR, a systematic approach must be adopted to appraise the present scenario to provide implicit information on possible impacts on these aspects.

The Vrishabhavathi basin spreading in the Bengaluru Urban and Rural area consists of ten micro watersheds. The selected area has only three micro watersheds covering an area of 89Sq. kms. The population and industrialisation has reached almost saturation level. A few streams in the upper regions carry domestic wastewater and industrial effluents. Some streams carry agricultural runoff also and discharge into Vrishabhavathi River.

Lakes are currently degraded by both natural and anthropogenic activities, which deteriorate their quality and push them to the brink of extinction in the process of unplanned development, giving rise to the need for suitable conservation strategies. Unfortunately, over the years, less attention has been given to wetland losses world over, including Bengaluru. The degradation of the wetlands has altered their functions, affecting the ecological balance.

Assessment of lakes and streams under different categories will help to improve the quality of water and its catchment conditions in order to make the wetland resources suitable for sustainable use. Strategies for restoration and conservation of lakes can be given based on the present status and the scenario of pollution of Lakes and streams.

#### **Recommendation and Strategies for Lake and River Management**

In urban areas, lakes survival and protection depends on the role of a number of other institutions/agencies such as Bangalore Development Authority, Bruhat Bengaluru Mahanagara Palike, Lake Development Authority, and Karnataka Forest Department, but in some parts of the Bengaluru outskirts the protection of Lakes are under the supervision of Minor Irrigation Department GoK, Local Planning Authority and Grama Panchayath.

Each fresh water body has an individual pattern of physical and chemical characteristics, which are largely determined by the climatic, geomorphological and geochemical conditions prevailing in the drainage basin. Most of the water bodies in the catchment basin have unique individual characteristics. Therefore, management strategies for individual water bodies were prepared as follows;

- Only treated sewage should be let into the lakes and removal of phosphate and total nitrogen should be made mandatory.

- The lake water sample should be collected away from the lake shore and 30cm below surface for a representative sample.
- Separate legislation for phosphate content in detergent soap and detergent powder to be made and detergent builder sodium tri poly phosphate should be substituted by Zeolite.
- Separate legislation for sewage treatment and phosphate removal from sewage and reuse for agricultural purpose should be made like European Union Directorate. Sewage treatment for phosphate removal should be made mandatory for all municipalities.
- All pollution control boards should be asked to implement the proposed treated sewage standards.
- The existing treatment facility at Madivala and Hebbal Lakes should be upgraded for removing phosphate and nitrogen.
- Awareness and education of lake preservation and lake benefits should reach all the people through print and electronic media. Public participation in the lake preservation should be encouraged.
- Check dam should be constructed in the lake area to increase percolation and recharge groundwater. Check Dams that retains the sediment and it can be removed before reaching the lake.
- Idols should be made out of clay without color and paints. The immersion of idols is a religious activity and people are sentimentally attached to it. Despite environmental problems, these activities cannot be terminated. The solution for this problem lies in changing the attitudes of the people. People from all walks of life have to be motivated to use idols made from environmentally friendly items. Idols should be made from natural materials as described in the holy scripts. Use of traditional clay for idol making rather than baked clay, plaster of paris, etc. may be encouraged, allowed and promoted.
- Painting of Idols should be discouraged. In case idols are to be painted, water soluble and nontoxic natural dyes should be used. Use of toxic and non-biodegradable chemical dyes for painting idols should be strictly prohibited.
- Worship material like flowers, vastras (clothes), decorating material (made of paper and plastic) etc. should be removed before immersion of idols. Biodegradable materials should be collected separately for recycling or composting. Non-biodegradable materials should be collected separately for disposal in sanitary landfills. Clothes may be sent to local orphan house(s).
- Finally people should be educated on the ill effects of immersion of idols in the holy water bodies through mass awareness program. The 'Idol Immersion Points' shall be cordoned off and barricaded. The said liner shall be removed on completion of the immersion ceremony so that remains of idols would be brought to the bank. Bamboo and wooden logs, if any would be reused. Clay like materials may be taken to sanitary land fill for disposal.
- Creating buffer zones with vegetation cover, that limits anthropogenic activities (Siltation, Pollution, etc). Care should be taken for without entry of sewage into the lakes. Environmental impacts of stresses on lakes were identified and lakes should be continuously monitored.
- Point and non-point sources of pollution should not be allowed to get into the lakes. A third party periodic inspection should be evolved and heavy penalty should be imposed on the basis of polluters pay principle.
- Industrial activities around the lakes should be minimized and dumping of industrial waste should be controlled.
- Vegetation associated with sewage inflow (Water hyacinth), should be continuously removed till effluent inflows are controlled.
- A proper landscape improvement activity for catchment and shore areas needs to be adopted.
- A development of a citizen's enforcement culture is therefore a very important step. In the face of administrative inefficiencies in environmental investigations and law enforcement, our present environment desperately needs citizen's help. It is important to note here that citizens have been explicitly excluded from legal monitoring and enforcement action
- Stakeholder participation in land soil water management with scientific inputs from local research and academic institutions for evolving different agricultural strategies, reducing soil erosion and improving soil fertility should be promoted. Even though governments need to take the lead in the development of strategies of lakes, other key stakeholders should be encouraged to play their part in both the formulation and implementation process.
- Promotion of environmental awareness and conservation to public and Government officials.

- Lakes area should be surveyed, fenced and declared as no development zone around lakes as notified by the Honorable High Court of Karnataka (WP No. 817/2008).
- Public participation and regulated sectors like voluntary organizations/NGO should be encouraged by the local authorities to control point and Nonpoint sources of pollution.
- Pollution control boards should impose stringent guidelines to control dumping of municipal solid waste, Electrical waste, Poultry waste, Bio medical waste, chemical wastes, dumping of used oil, paints, household chemicals, plastic and packing material waste in and around the lake bed and sewage and effluent entering into the lakes.
- Bangalore Development Authority (BDA), BMRDA and forest department should create database using geographical information system (GIS) to hold and to relate data associated with land use such as vegetation clearance and soil erosion information.
- The local government officials should develop ordinances for preventing soil erosion and sediment control at community level.
- Awareness should be created at ward levels by District administrators, Metropolitan authorities and pollution control boards on management of wastes like litter, pet wastes, leaves and debris that enter street gutters and storm water drains and finally enter into lakes polluting it.
- Agricultural departments should encourage Organic farming or natural farming to minimize the contamination of surface water and ground water. A well-established riparian corridor should be made by the lake development authorities to regulate water temperature, protect the bank from erosion, and filter pollutants from storm water.
- Best management practices (BMPs) to be adopted by BDA for Construction sites in avoiding sediment that enters into the lakes.
- Island sanctuaries for the lakes should be developed by concerned authorities. Improvement of sanctuaries for birds is a necessity as the lakes seem to be a hotspot for bird diversity.
- Vehicle washing, laundry activities and bursting of Fire-crackers in lakes should be avoided by the concerned authorities like Forest Department, Bruhath Bangalore Mahanagara Palike (BBMP), Bangalore Development Authority (BDA), BMRDA, Bangalore urban Zilla Panchayat and pollution control boards to minimize the toxicity levels in lakes.
- To avoid the Urban Runoff, good design of drainage systems should be adopted by BMRDA, BDA and BBMP. Urban runoff to be controlled by establishing trenches, basins, and detention ponds at construction sites to hold, settle, and retain suspended solids and associated pollutants.
- Careful planning of the sewerage network should be adopted by BWSSB to address the Pollutant loads discharged from urban drainage systems problems. The modeling approach should be prepared and applied based on local rainfall patterns, the variety of materials entering the sewer network, and the processes of mixing and degradation that occur in the sewers.
- The storm water and sewage drains should be collected through appropriate concrete drains or pipelines, that should be connected to sewage treatment plant which will solve the problem of erosion and sedimentation.
- Community toilets, Pay and use toilets should be constructed by BBMP away from the shores of lakes to minimize the open defecation.
- Encroachments, diversion of lakes and drainage channels should not be allowed and wherever it has taken place, it should be restored to the extent feasible by lake authorities. Encroachment of tank bed and shore areas should be strictly prevented in accordance with K B Koliwad report 2016, Government Karnataka on demolition of buildings in buffer zones of all the lake beds.
- To overcome Loss of upland habitat, before proposing any developmental projects in upland areas, the habitat impacts are to be assessed properly. Upland Ecosystem Valuation to be carried out by ensuring the value of functioning of upland areas and land use decisions by the management.
- Research and advancement in technology should be promoted by the concerned research organizations to address the issues in water sector in a scientific manner. Innovations in water resources sector should be encouraged.
- Organizations like, Pollution control boards, Forest Department, Minor Irrigation Department, Horticulture Department, Public Works Department (PWD), Bruhath Bangalore Mahanagara Palike (BBMP), Bangalore

Development Authority (BDA), Tourism Department, City Municipal Councils, BMICIAPA, BMRDA, and Panchayats should have coordination, to maintain uniform information for the lakes and monitor the lakes at regular intervals.

- For the effective shoreline management, Best Management Practices (BMPs) should be followed in accordance with Minnesota Pollution Control Agency standards. These practices are designed to collect sediment and absorb the pollutants, slow the destructively high flow rates, decrease the volume of water before being discharged into the lakes, streams, and wetlands. The approaches and practices of the technique called Low impact development (LID) are to be implemented in the study area at the best to reduce runoff of water and pollutants from the site at which they are generated.
- Maintain tree cover in order to maintain the Carbon currently stored by the urban vegetation and the levels of pollutants absorbed; afforestation programmes should ensure a further increase in pollution elimination rates.
- The main river courses of River have to be cleaned up by removing the weeds and other obstacles hindering the water flow to provide a better course for free flow into River Basin.
- The inflow and outflow channels should be cleaned up and proper linkage for the tank cascades should be provided to facilitate the runoff to flow smoothly.

## 12. ECONOMICS

### 0312023KESHAVA, S R (Department of Economics, Bangalore University, Bangalore). A STUDY ON THE ECONOMIC CONDITIONS OF FARMERS IN NORTH DRY, CENTRAL DRY ZONE AND SOUTH DRY AGRO CLIMATIC ZONES IN KARNATAKA

Indian Agriculture and its allied sectors are the major sources of livelihood for the majority of its population. One of the two in India's workforce depends on the primary sector for their livelihood in India, even today. Agriculture is highly labour intensive creating the jobs in rural India. The cost of cultivation data has revealed that labour accounts for 40% of the total variable cost of crop production. Hence Indian Agriculture is regarded as the backbone of India, but unfortunately the backbone is fractured and the Indian farmer who took the food deficit India to food secured India, thereby holding the Indian esteem and self-respect high is struggling. Despite seven decades of political independence and near to 7 decades of planning the Indian farmer still gambles with monsoons live on subsistence-level income, lack of farm infrastructure have to plead and cry for subsidies and loan waivers. The Economic Survey 2017-18 (2018) points out that agriculture is still vulnerable to vagaries of the weather as 73.2 million hectares area (52%) out of 141.4 million hectares of the net sown area is still dependent on rain. According to the World Bank, the all India percentage of net irrigated area to the percentage of total cropped area is even lower at 36.79% in 2013.

The review of literature on the farm crisis in India attribute it to 1) increase in cost of production and decline in the price of agricultural produce; 2) frequent price fluctuations against the interests of farmers, 3) increase in the dependence on money lenders for credit, 4) excessive use of chemical fertilizers and decline of soil health 5) increased occurrences' of drought/floods and repeated crop failures, 6) overutilization of groundwater and frequent failure of bore wells, 7) increasing debts and falling into debt trap 8) failure in the implementation of land reforms 9) lack of modernization, 10) decrease in public investment. The crux of the farm crisis lies in the lack of farm infrastructure and suitable price policy for the farm products.

Ashok Dalwai Committee on Doubling Farmers' Income (2017) estimates the average the income of the farmer at Rs. 6498 per month. The present Modi Government is working towards doubling the farmer's income by 2022. The Government has taken many measures to increase the farmer's income, to name few, trying to upgrade the Gramin Haats, provide an electronic online trading platform through e-NAM, increasing water efficiency through Pradhan Mantri Krishi Sinchayee Yojana, better insurance coverage to crops for risk mitigation under Pradhan Mantri Fasal Bima Yojana, and many interest subvention schemes. Economic Survey 2018-19 highlights that Governments is targeting the doubling of farmers income through seven measures namely '1) improvement in crop productivity 2) improvement in livestock productivity 3) resource use efficiency or savings in the cost of production 4) increase in the cropping intensity 5) diversification towards high-value crops 6) improvement in real prices received by farmers; and 7) shift from farm to non-farm occupations,"

The study aims to see the present the socio-economic condition of the farmers and the usefulness of the present programmes, the problems and hurdles, the solutions from the farmer's perspective.

#### Objectives of the Study

The important objectives of the Study are

1. To find out the income, expenditure and savings levels of farmers in the study area
2. To compare the income and expenditure of farmer's households in the three selected taluks belonging to three agro-climatic zones
3. To identify the problems the farmers are facing and the suggestions to overcome it.

#### Hypothesis

1.  $H_0$ : The level of income is independent of the Socio-economic conditions of the respondents in the study area.

2.  $H_1$ : The level of income is dependent of the Socio-economic conditions of the respondents in the study area.

### Data and Methodology

The present paper is based primarily on the Primary data. The Secondary source of data is used to a minimal extent, as the background to the study.

The secondary data is obtained from several sources like Government of India's Economic Survey, Annual Report of Ministry of Agriculture, NSSO Reports, Government of Karnataka's Economic Survey and DSO office's District at a Glance.

The Primary data is collected by canvassing the structured interview schedules among the sample households in the selected the village, based on the simple random sampling method.

Sampling Procedure; The Karnataka is divided into 10 agro-climatic zones taking into consideration the rainfall pattern, soil types, texture, depth and physicochemical properties, elevation, topography, major crops and type of vegetation. Using multistage stratified sampling technique, in the first stage out of 10 agro-climatic zones, three zones namely Northern Dry Zone, Central Dry Zone and Southern Dry Zone were identified at the first stage. In the second stage, a taluk was identified from each zone namely Sindhanur from NDZ, Hosdurga from CDZ and Pandavapura from SDZ; in the third stage, two villages were randomly selected from each taluk and in the fourth stage farm households were listed and then 20 respondent households were identified based on the simple random method. In total, primary data is collected from 120 respondent households from three selected agro-climatic zones.

### Distribution of Sample Respondents

Distribution of Sample Respondents: Zones, Taluks and Villages Covered in the study area

| Zone              | Taluk             | Villages           | Respondent households        |
|-------------------|-------------------|--------------------|------------------------------|
| Northern Dry Zone | Sindhanur<br>40   | Kalmala            | 20                           |
|                   |                   | Mulluru            | 20                           |
| Central Dry Zone  | Hosdurga<br>40    | Goravigundanahalli | 20                           |
|                   |                   | Udinoor            | 20                           |
| Southern Dry Zone | Pandavapura<br>40 | Kennalu            | 20                           |
|                   |                   | Hulkere Koppalu    | 20                           |
| 3 Zone            | 03 Taluks         | 06 Villages        | 120<br>Respondent Households |

The primary data was collected in 2018-19 and the survey was carried out during November 2018 to March 2019. The data is analysed by using the simple statistical tools like Percentage, Mean, Minimum, Maximum, Chi-Square and Average.

### Demographic Features of the Respondent Households

Table 1 Demography features and Education

| Taluk    | Sindhanur | %  | Hosdurga | %    | Pandavapura | %  | Total | %    |
|----------|-----------|----|----------|------|-------------|----|-------|------|
| Category |           |    |          |      |             |    |       |      |
| SC       | 12        | 30 | 8        | 20   | 8           | 25 | 30    | 25.0 |
| ST       | 4         | 10 | 5        | 12.5 | 8           | 15 | 15    | 12.5 |



|                                 |    |    |    |      |    |    |    |       |
|---------------------------------|----|----|----|------|----|----|----|-------|
| OBC                             | 24 | 60 | 27 | 67.5 | 24 | 60 | 75 | 62.5  |
| Family Size                     |    |    |    |      |    |    |    |       |
| Three                           | 12 | 30 | 20 | 50   | 4  | 10 | 36 | 30.00 |
| Four                            | 16 | 40 | 16 | 40   | 24 | 60 | 56 | 46.67 |
| Five                            | 12 | 30 | 4  | 10   | 12 | 30 | 28 | 23.33 |
| No. of Dependents in the family |    |    |    |      |    |    |    |       |
| Two                             | 12 | 30 | 25 | 62.5 | 16 | 40 | 53 | 44.17 |
| Three                           | 16 | 40 | 12 | 30   | 16 | 40 | 44 | 36.67 |
| Four                            | 12 | 30 | 3  | 7.5  | 8  | 20 | 23 | 19.17 |
| Age of Respondents              |    |    |    |      |    |    |    |       |
| 30-40                           | 16 | 40 | 12 | 30   | 6  | 15 | 34 | 28.33 |
| 40-50                           | 12 | 30 | 14 | 35   | 18 | 45 | 44 | 36.67 |
| 50 & above                      | 12 | 30 | 14 | 35   | 16 | 40 | 42 | 35.0  |
| Education                       |    |    |    |      |    |    |    |       |
| Illiterate                      | 20 | 50 | 4  | 10   | 12 | 30 | 36 | 30    |
| Primary School                  | 20 | 50 | 8  | 20   | 16 | 40 | 44 | 36.67 |
| High School                     | 0  | 0  | 8  | 20   | 4  | 10 | 12 | 10    |
| SSLC                            | 0  | 0  | 20 | 50   | 4  | 10 | 24 | 20    |
| Degree                          | 0  | 0  | 0  | 0    | 4  | 10 | 4  | 3.33  |

Source: Computed from field survey

**Category of the Respondents:** Out of 120 sample size, 30 (25.0 per cent) respondent households belong to the Scheduled Caste category, 15 (12.5 per cent) respondent households belong to the Scheduled Tribe category, and 75 (62.5 per cent) ) respondent households belong to Other Backward Category (OBC) in the study area.

**Family Size of the respondents:** Out of 120 sample size, 36 (30.0 per cent) respondent households family size is 3 members, 56 (46.67 per cent) respondents family size is 4 members and 28 (23.33 per cent) respondents family size is 5 members.

**Family Dependent Size:** Out of 120 sample size, 53 (44.17 per cent) respondents family dependents size is two, 44 (36.67 per cent) respondents family dependents size is three and 23 (19.17 per cent) respondent's dependents size four.

**Age Group of the Respondents:** Out of the total sample households of 120, 44 (36.67 per cent) of respondents are in the age group of 30-40 years followed by 42 (35.0 per cent) respondents are in the age group of 50 & above year and 34 (28.33 per cent) are in the age group of 30-40 years.

**Education:** In the sample, 36 (30 per cent) respondents were illiterates, 44 (36.67 per cent) respondents had their education up to primary and middle school, 12 (10 per cent) respondents had their education up to high school, 24 (20%) respondents had their education up to SSLC and 4 (3.33 per cent) respondents had their education up to Graduation.

### Occupation

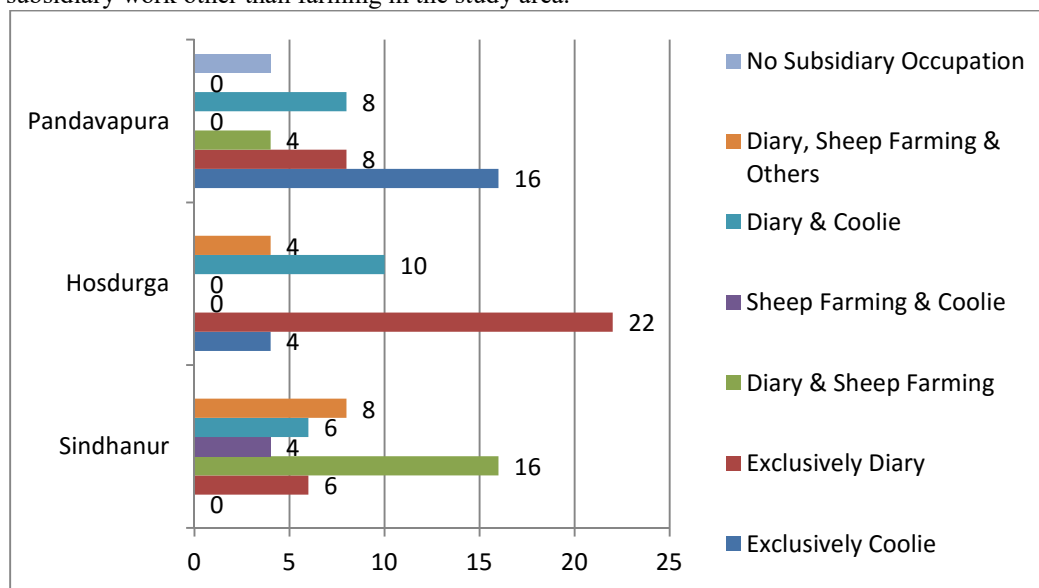
As the farmer households were listed and out of them 120 respondent households were randomly selected, the main occupation of all respondent households are Farming. Except for four respect households, all other respondent households also were involved in other subsidiary occupation like a collie, dairy, trade and sheep farming. The following table gives the details of the subsidiary occupation of the respondent households.

Table No. 2 Subsidiary Occupation of the Respondent Households

| Subsidiary Occupation         | Sindhanur | %   | Hosdurga | %   | Pandavapura | %   | Total | %     |
|-------------------------------|-----------|-----|----------|-----|-------------|-----|-------|-------|
| Exclusively Coolie            | 0         | 0   | 4        | 10  | 16          | 40  | 20    | 16.67 |
| Exclusively Diary             | 6         | 15  | 22       | 55  | 8           | 20  | 36    | 30.00 |
| Diary & Sheep Farming         | 16        | 40  | 0        | 0   | 4           | 10  | 20    | 16.67 |
| Sheep Farming & Coolie        | 4         | 10  | 0        | 0   | 0           | 0   | 4     | 3.33  |
| Diary & Coolie                | 6         | 15  | 10       | 25  | 8           | 20  | 24    | 20.00 |
| Diary, Sheep Farming & Others | 8         | 20  | 4        | 10  | 0           | 0   | 12    | 10.00 |
| No Subsidiary Occupation      | 0         | 0   | 0        | 0   | 4           | 10  | 4     | 3.33  |
| Total                         | 40        | 100 | 40       | 100 | 40          | 100 | 120   | 100   |

Source: Computed from field survey

Out of 120 sample size, 36 (30.0 percent) respondents were doing diary as subsidiary occupation other than farming, 24 (20.0 percent) respondents doing diary & Coolie as subsidiary occupation, 20 (16.67 percent) respondents doing diary & sheep farming as subsidiary occupation, 20 (16.67 percent) respondents were doing exclusively coolie as subsidiary work, 12 (10.0 percent) respondents were doing diary, sheep farming & coolie as subsidiary occupation and 4 (3.33 percent) respondents doing sheep farming and coolie, 4 (3.33 percent) respondents not doing any subsidiary work other than farming in the study area.



Source: Derived from the table no 2

In Sindhanur taluk majority of the respondents (40.0 percent) were doing diary and sheep farming as subsidiary occupation, in Hosdurga taluk majority of the respondents doing (55.0 percent) exclusively diary as subsidiary occupation and in Pandavapura taluk majority (40 percent) respondents were going for coolie as subsidiary occupation.

#### Land Ownership

Farming Land is categorized as 1) Irrigated land and 2) Dry Land. The ownership of the land is provided in the Table No 3

Table No 3: Land Ownership

| Taluk                     | Sindhanur | %   | Hosdurga | %   | Pandavapura | %   | Total | %      |
|---------------------------|-----------|-----|----------|-----|-------------|-----|-------|--------|
| Irrigated land            | 40        | 100 | 16       | 40  | 32          | 80  | 88    | 73.33  |
| Dry Land                  | 0         | 0   | 18       | 45  | 4           | 10  | 22    | 18.33  |
| Both Irrigated & Dry Land | 0         | 0   | 6        | 15  | 4           | 10  | 10    | 8.33   |
| Total                     | 40        | 100 | 40       | 100 | 40          | 100 | 120   | 100.00 |

Source: Computed from field survey

In the study area out of 120 sample size, 88 respondents households (73.33 percent) own irrigated land, 22 respondents households (18.33 percent) own dry land and 10 respondents (8.33 percent) own both irrigated and rain fed land

In the study area Sindhanur taluk is having more irrigated land followed by Pandavapura and Hosdurga taluk.

#### Categorisation of Land Holding

Based on the ownership of size of the land holding, the farmers are categorized into marginal farmers, small farmers and semi-medium farmers. In the study area there were no medium and large farmers.

Table: Categorisation of Land Holding

| Taluk               | Sindhanur | %   | Hosdurga | %    | Pandavapura | %    | Total | %      |
|---------------------|-----------|-----|----------|------|-------------|------|-------|--------|
| Marginal Farmers    | 24        | 60  | 29       | 72.5 | 25          | 62.5 | 78    | 65.00  |
| Small Farmers       | 10        | 25  | 9        | 22.5 | 11          | 27.5 | 30    | 25.00  |
| Semi-Medium Farmers | 8         | 20  | 2        | 5    | 4           | 10   | 14    | 11.67  |
| Total               | 40        | 100 | 40       | 100  | 40          | 100  | 120   | 100.00 |

Source: Computed from field survey

In the study area out of 120 sample size, 78 (65 percent) respondents households comes under marginal farmers category, 30 (25.0 percent) respondents households comes under small farmers category, 14 (11.67 percent) respondent households comes under semi-medium farmers category. Hosdurga has relatively more marginal farmers and Pandavapura has more small farmers and Sindhanur has relatively more semi medium farmers.

## Results and Discussion

### Annual Income

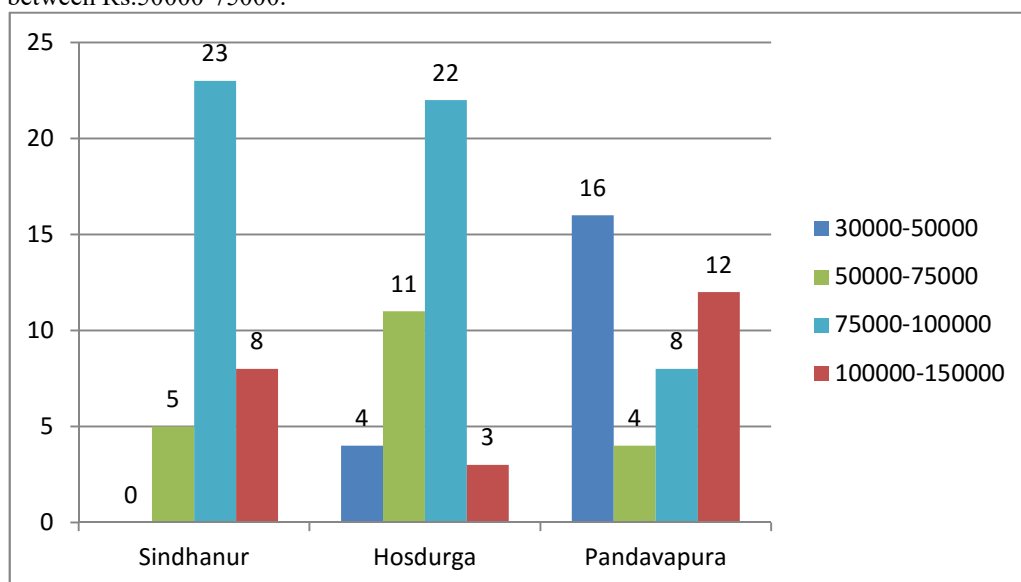
Table No. 5 Total Annual Income of the Respondent Households

| Taluk/Income   | Sindhanur | %    | Hosdurga | %    | Pandavapura | %   | Total | %      |
|----------------|-----------|------|----------|------|-------------|-----|-------|--------|
| 30000-50000    | 0         | 0    | 4        | 10   | 16          | 40  | 20    | 16.67  |
| 50000-75000    | 5         | 12.5 | 11       | 27.5 | 4           | 10  | 20    | 16.67  |
| 75000-100000   | 23        | 57.5 | 22       | 55   | 8           | 20  | 53    | 44.17  |
| 100000-150000  | 8         | 20   | 3        | 7.5  | 12          | 30  | 23    | 19.17  |
| 150000 & above | 4         | 10   | 0        | 0    | 0           | 0   | 4     | 3.33   |
| Total          | 40        | 100  | 40       | 100  | 40          | 100 | 120   | 100.00 |

Source: Computed from field survey

In the 40 sample households in Sindhanur taluk, 23 households (57.5 percent) had their annual income between Rs.75000-100000, 8 households (20.0 percent) had their annual income between Rs.100000 -150000, 4

households (10.0 percent) had their income between 150000 & above, 5 households (12.5 percent) had their income between Rs.50000-75000.



Source: Derived from the table no

In the 40 sample households in Hosdurga taluk, 22 households (55 percent) had their annual income between Rs.75000-100000, 11 households (27.5 percent) had their annual income between Rs.50000 -75000, 3 households (7.5 percent) had their income between 100000-150000 and 4 households (10.0 percent) had their income between Rs.30000-50000.

In the 40 sample households in Pandavapura taluk, 16 households (40.0 percent) had their annual income between Rs.30000-50000, 12 households (30.0 percent) had their annual income between Rs.100000 -150000, 8 households (20.0 percent) had their income between 75000-100000 and 4 households (10.0 percent) had their income between Rs.50000-75000.

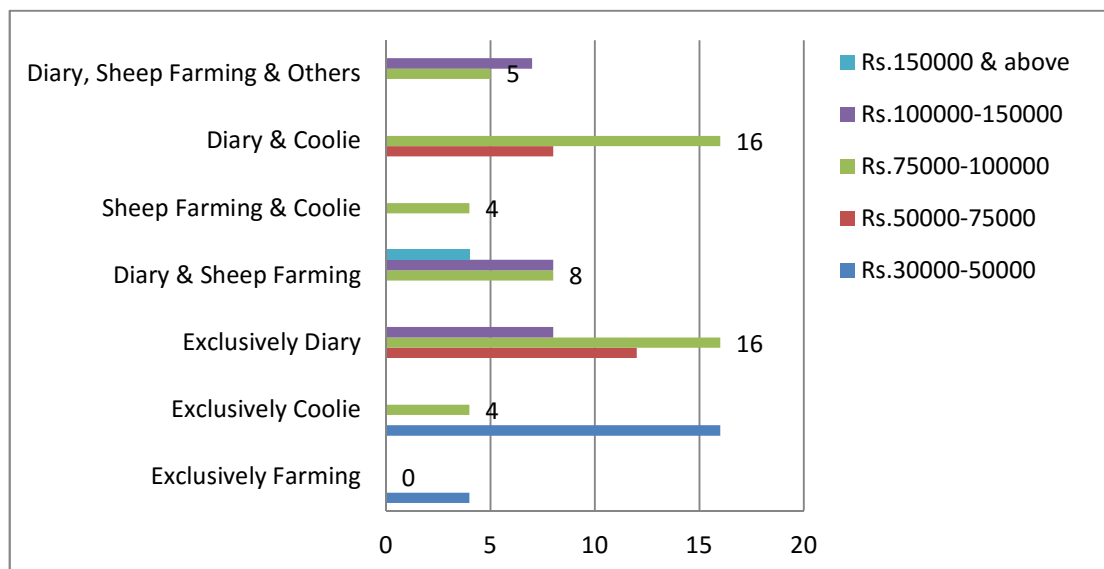
### Income and Occupation Pattern

Table No 6: Income pattern of respondent Households based on Occupation pattern

| Level of Income   | Exclusively Farming | Exclusively Coolie | Exclusively Dairy | Diary & Sheep Farming | Sheep Farming & Coolie | Diary & Coolie | Diary, Sheep Farming & others |
|-------------------|---------------------|--------------------|-------------------|-----------------------|------------------------|----------------|-------------------------------|
| Rs.30000-50000    | 4                   | 16                 | 0                 | 0                     | 0                      | 0              | 0                             |
| Rs.50000-75000    | 0                   | 0                  | 12                | 0                     | 0                      | 8              | 0                             |
| Rs.75000-100000   | 0                   | 4                  | 16                | 8                     | 4                      | 16             | 5                             |
| Rs.100000-150000  | 0                   | 0                  | 8                 | 8                     | 0                      | 0              | 7                             |
| Rs.150000 & above | 0                   | 0                  | 0                 | 4                     | 0                      | 0              | 0                             |
| Total             | 4                   | 20                 | 36                | 20                    | 4                      | 24             | 12                            |
| %                 | 3.33                | 16.67              | 30.00             | 16.67                 | 3.33                   | 20.00          | 10.00                         |

Source: Computed from field survey

Four respondents level of income is between Rs.10000-30000 Income patterns of Dairy with only one cow, collie along with dry land farming is living at subsistence living earning



Source: Derived from the table no 6

#### Minimum, Maximum, Mean Income, Expenditure and Savings of Respondent Households

It is important to know the minimum, Maximum and Mean Income, Expenditure and Savings of Respondent Households in three taluks representing the different zones.

Table 7: The Minimum, Maximum, Mean Income, Expenditure and Savings

| Taluk            | Sindhanur | Hosdurga | Pandavapura |
|------------------|-----------|----------|-------------|
| Min. Income      | 67500     | 46000    | 42600       |
| Max. Income      | 193000    | 105000   | 120000      |
| Mean Income      | 94700     | 77000    | 75600       |
| Min. Expenditure | 52400     | 43000    | 39600       |
| Max. Expenditure | 126000    | 94850    | 105000      |
| Mean Expenditure | 79056     | 66500    | 63825       |
| Min. Saving      | 6000      | 4000     | 3000        |
| Max. Saving      | 40000     | 35000    | 42000       |
| Mean Saving      | 13750     | 9200     | 12700       |

Source: Computed from field survey

The average mean annual income of respondent households in Sindhanur taluk is Rs. 94700; Hosdurga is Rs.77000 and Rs.75600 in Pandavapura. The average mean annual expenditure in Sindhanur is Rs.79056 with the mean annual savings of Rs. 13750. The average mean annual expenditure in Hosdurga is Rs.66500 with the mean annual savings of Rs. 9200. The average mean annual expenditure in Pandavapura is Rs.63825 with the mean

annual savings of Rs. 12700. Higher the income, higher will be the probability of expenditure and savings. Sindhanur households have higher income, higher expenditure and higher savings compared to Hosdurga and Pandavapura households.

Sindhanur taluk has higher income as all the respondents were having irrigated lands where as in other two taluks Hosdurga and Pandavapura households The another important thing is the inequality of income is higher in Sindhanur when compared to other two taluks namely Hosdurga which has 60 percent of rain fed land and Pandavapura has 20 percent of rain fed area. But Hosdurga, though relatively have more rain fed area has higher income than Pandavapura as majority of respondents are also having dairy income.

**Average Good Price for farm products in past five years**

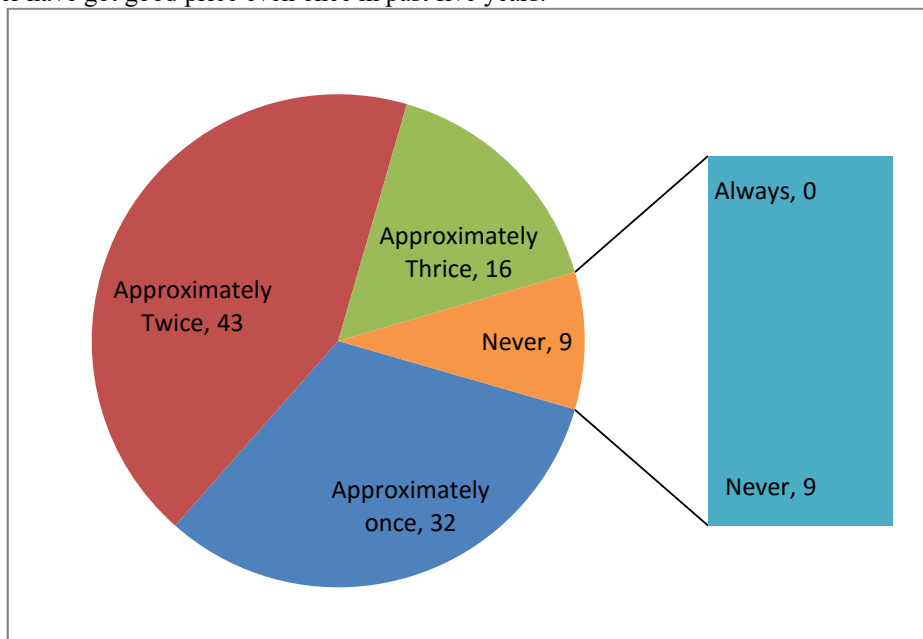
The famers were asked, on an average in the past five years approximately how many times did they get good price for their produce.

Table 8: the number of times good price for farm produce in the past five years

|   | Approximately once | Approximately Twice | Approximately Thrice | Always | Never |
|---|--------------------|---------------------|----------------------|--------|-------|
| Get reasonably good price in the market | 32                 | 43                  | 16                   | 0      | 9     |

Source: Computed from field survey

Out of the 32 percent respondents said the approximately got one n five years, 43 percent said they got good price twice in five years and 16 percent said they got good price twice in five years, whereas none said four out of five times or five out of five times they got good price for their products in past five years. Interestingly 9 percent said they never have got good price even in past five years.



Source: Derived from field survey

**Benefits Derived from Government Polices and Programmes**

The respondents were asked about the benefits derived from the Government policies and programmes on agriculture development and farmers welfare. 68 percent farmers said they have benefitted from Government policies and programmes at least once, 17 percent said they have heard of at least one Government policy, but not benefitted and 15 percent said they have not heard of any Government policies for their welfare.

Table No 9: Benefits derived from Government Policies and Programmes

| Respondents  | Percentage |
|--|------------|
| Heard of Government programmes and has benefitted at least once    | 68         |
| Heard of at least one Government programmes and has not benefitted | 17         |
| Have not heard of any Government programmes                        | 15         |

Source: Derived from field survey

### Hypothesis:

#### Testing of Hypothesis of Income and Socio-Economic Status of Respondent Households

| Indicator          | DF | Chi-Square | P-value* | Decision              |
|--------------------|----|------------|----------|-----------------------|
| Level of Education | 20 | 55.848     | 0.000    | Reject H <sub>0</sub> |
| Family Size        | 10 | 40.457     | 0.000    | Reject H <sub>0</sub> |
| Occupation         | 35 | 1.54       | 0.000    | Reject H <sub>0</sub> |
| Land holding       | 15 | 52.495     | 0.000    | Reject H <sub>0</sub> |

\*Statistically significant at 5% level

To test the hypothesis whether the level of annual income depends upon socio-economic condition is tested by using socio-economic parameters namely Levels of education, Occupation, and Landholding.

The independent of the level of income and level of education is tested by using Chi-square test since both the variables are categorical in nature. The Chi-square value of 55.848 with 20 degrees of freedom is statistically significant at 5% since its p-value is 0.00, therefore the null hypothesis of level of income and Level of education is independent are rejected, which implies alternative hypothesis is accepted.

The independent of the level of income and family size is tested by using Chi-square test since both the variables are categorical in nature. The Chi-square value of 40.457 with 10 degrees of freedom is statistically significant at 5% since its p value is 0.00, therefore the null hypothesis of the level of income and family size are independent is rejected, which implies alternative hypothesis is accepted.

The independent of the level of income and occupation is tested by using Chi-square test since both the variables are categorical in nature. The Chi-square value of 1.54 with 35 degrees of freedom is statistically significant at 5% since its p value is 0.00, therefore the null hypothesis of level of income and occupation is independent are rejected, which implies alternative hypothesis is accepted.

The independent of level of income and Land holding is tested by using Chi-square test since both the variables are categorical in nature. The Chi-square value of 52.495 with 15 degree of freedom is statistically significant at 5% since its p value is 0.00, therefore the null hypothesis of level of income and Land holding are independent is rejected, which implies alternative hypothesis is accepted.

### Problems faced by the farmers

The respondents were asked to list out the problems they faced and rank them based on the severity of the problem. The most important problem which 86 percent farmers listed was not getting the good price for their

products, followed by Lack of availability farm inputs like seeds, fertilizers, others on time and Lack of adequate and timely credit followed by other 9 problems listed in the table below.

| Sl No | Problems   | %  |
|-------|--|----|
| 1     | Not getting Good Price for the farm produce in the market  | 86 |
| 2     | Lack of availability farm inputs like seeds, fertilizers, others on time                                       | 58 |
| 3     | Lack of adequate and timely credit   | 51 |
| 4     | Farm inputs getting costlier   | 49 |
| 5     | Mounting debt burden   | 45 |
| 6     | Lack of information on time and failure of Government officials to visit adequate times for extension services | 44 |
| 7     | Middleman  | 39 |
| 8     | Lack of good transportation facilities and Storage facilities  | 39 |
| 9     | Drought/Floods   | 36 |
| 10    | Unfertile Land   | 31 |
| 11    | High interest rate of Money lenders  | 28 |
| 12    | Others   | 26 |

Source : Computed from field survey

### Suggestions:

The important suggestions which the farmers suggested to solve the problems in the agriculture

1. Farm inputs must be available adequately on time and at affordable prices.
2. Farmers must get a minimum price for the farm output taking the cost of production and nominal profit into consideration.
3. MSP should be announced to all the agriculture products and effectively implemented.
4. A tribunal to address the grievance should be established in every taluk and those who give supply faulty inputs and those officials who fail to procure, when market prices crash and give MSP should be jailed and fined.
5. Provide quality farm infrastructure.
6. Government should help the farmers to improve the fertility of the soil.
7. Village Panchayath office should provide the agriculture machines and equipment on hire.
8. Farmers should be included in the water management committees, water should be a public resource. Groundwater should be recharged using rainwater harvesting, removing silt from ponds and tanks and other measures.
9. MGNREGP works should be used for Groundwater recharging initiates by building bunds, farm ponds and removing silt from ponds and tanks and other measures.
10. All existing wells and ponds should be renovated. No construction activity should be undertaken in the pond nor in the areas where the rainwater flows into the ponds.
11. The fodder should be grown in village common grazing land like gommalla(common grazing land) by the Government agencies with due help from concerned farmers.

### Conclusion

Agriculture growth is the minimum and necessary condition for Inclusive growth in India. Food security, price stability, income and livelihood of the majority of Indians lie in agriculture. The transformation of the present static rural India into the dynamic happening economy is possible only with the overall development of Agriculture in India. Agriculture development is the key to poverty eradication in poverty rich rural India and overall rural development. If agriculture is not developed, the farmers will be in the midst of poverty and thereby, low standard of living. The farmers who give corn to society will be suffering; hence suitable steps should be taken to improve the



farm infrastructure as well to increase the morale of the farmer. Farmer's higher standard of living will not only make them happy, but it leads to higher growth and development which will be inclusive and sustainable.

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#### **0312024 VERMA, NMP (School of Economics and Commerce , Babasaheb Bhimrao Ambedkar University, Lucknow). MACROECONOMICS KNOWLEDGE GROWTH: WHY IT COULD NOT CONTAIN EMERGING INDIAN PROBLEMS FULLY?**

Over the last two and half century's macroeconomics thinking has grown sharply. As the need on the planet changed so is the changes in economic thinking we observe. The manmade technological advancement has satisfied numerous demanding requirements. Sometimes people preferred closed economy and sometimes people preferred open economy. The present stage of globalization is perhaps the fourth stage of openness of the economies. The natural difference is observed in terms of surplus labour and disguised unemployment in South Asia and labor stress in Europe, Australia and US. There is concentration of economic miseries in South Asia, Africa, and Latin America. This trend increases labor and capital flow. The main aim of this paper is to critically review the past and current state of fundamental macroeconomics thinking. The knowledge of macroeconomics is aggregation of all our outcomes that occurred in the past and the present, it is historically determined. So, this paper follows a well-structured and organized direction which traces the origins and recent development of macroeconomics in current and historical perspective vis-a-vis the changing behavior and emerging social need. The paper firstly examines fundamental changes in economic thinking starting from Physiocrats, Mercantilists, Classicals, Keynesians, post Keynesian, Neoclassicals, Monetarists, and Rationals. In the later part it shows the trend of some economic variables. In the end major challenges are highlighted for which macroeconomics needs to work coherently. In conclusion, the paper highlights, with substantiation of secondary data, the status of emerging Indian economic

challenges for which macroeconomic perspective planning is required. Still the economy is facing socioeconomic problems despite theoretical macroeconomic knowledge growth. This gap needs to be fulfilled.

### **1. Introduction**

The often so seen and cited book authored by Kenneth E. Boulding entitled 'Economics as a Science' (1970) is a very informative book highlighting the branching of economics as a social science, ecological science, behavioral science, political science, mathematical science, moral science and future of man. According to him the total social science system consists of all the people in the universe, all the roles which they occupy, all the patterns of behaviour, all their inputs and outputs which are relevant to other human beings and all the organizations and groups that they belong to. This is of course a very large complicated system. Nevertheless, it is convenient to separate it from other systems of the world even though all the world's systems interact and form a total system of planet. Social scientists job is to study the socioeconomic-sphere, which operates as a system at a somewhat different level of organization from the others (1970). His last branching of economics 'Future of Man' contains many such things as if without economics future of civilization may not be smooth. Here man does not mean only male person but also female person, the animals, birds, plants, and planet as such. As the civilization grew, there has been seen growing need of the living people for survival. This created a rising demand of food and non-food items. Thus the basic role of economics is to take care of both living and nonliving elements on the planet for the purpose of satisfying social needs, growth over time and welfare of the downtrodden. The very sensitive branching of economics such as micro, macro, finance, trade, are some of the important core papers that help study the economic dynamics. Out of these macroeconomics studies aggregative dynamics and statics of the entire economy. Indian social science knowledge growth needs better quality management (Verma, 2015).

### **2. Macroeconomics – a Hard Discipline**

The macroeconomics subject is concerned with the aggregative structure, performance, and behavior of the economy as a whole. Data aggregation is a very tough job. That is why, macroeconomics is considered as a very hard branch of economics. The main concern of macroeconomics is to analyze and attempt to understand the determinants of the main aggregate trends of key variables in the economy with respect to production and consumption of gross output of goods and services, unemployment, inflation and international transactions. In short run, we can say, macroeconomics seeks to explain the cause and impact of short run flexibilities and fluctuations in GDP and several major determinants of long run economic growth. The subject matter of macroeconomics is very crucial for us. Naturally, it has important influence over the lives and welfare of the people. An economy with successful macroeconomic management and measurement experiences low unemployment and inflation, and steady and sustained economic growth. Macroeconomic performances and policies are closely linked with one another. So, major and key economic issues draw current media attention and play an inevitable role in any political debate. Therefore, it can be said that macroeconomic performances and monetary cum fiscal policies often try knife edge balancing of the economy. Research in this area confirmed that the outcome of voting has been affected by the macro performance of the economy as measured by GDP, consumer income relationship, interest–investment relationship, CPI/WPI based measurement of inflation, unemployment, redistribution through fiscal policy, functioning of the product and money markets through IS-LM, monetary policies, fiscal policies and finally economic growth. The Phillips curve also shows trade off relationship between employment and inflation (Singh & Verma, 2016). Once the economy is backward then even knowledge multiplier becomes low and slow (Verma, 2019, BEMM Proceeding).

### **3. Three Interactive Agents**

There are three broad agents in the economy. They are households, firms, and government. The factors which influence medium and long run growth and short run fluctuations are very essential in order to design and implement economic policies which can have enough potential to improve life decency. The primary aim of economic research is to develop a comprehensive understanding of how the agents of the economy operate and how it is likely to react for specific policies. Macroeconomic theories consist of a set of views and simultaneous equations which answer how the economy virtually operates. It forms the basis upon which economic policies is

designed and implemented. A successful theory enables economist to make better predictions about the consequences of different policy measures adopted by Government. It helps to reduce aggregate instability in the economy. Another economist Blanchard pointed out that macroeconomics were not an exact science but an applied one where ideas, theories, and models are constantly evaluated against the fundamental facts and often modified and rejected. There are several schools of thought in economics in general. That is why there are a large number of controversies in it. Macroeconomics has seen of considerable significance since its inception in economics in 1930 onwards. The ideas of Keynes, during depression and giving public investment as a solution, were well discussed. There is significant conflict of opinions we have experienced in the historical journey of macroeconomic fluctuations. The economist may differ on theoretical issues, empirical evidences, and choice of policy instruments. In order to achieve major goals of economic policies the choice of appropriate instrument will depend on the detailed analysis of the cause of particular macroeconomic problem, either of household, firms, or government. The history of economic thought sums up that series of events are one of the main driving forces behind the evolution of new knowledge. The past economic outcomes and results often challenges the existing theoretical literature and led to modifications in existing theories or/and evolution of a few new theories.

#### 4. Pre Classical vs. Classical Political Economy

The pre-classicals such as Physiocrats concentrated on agriculture because at the earliest time there was no formal manufacturing and service sector. Agriculture and allied activities were the only main source of national income. Subsequently Mercantilists started commercialization based study including trade. The Classical, including Adam Smith, David Ricardo, T R Malthus, J B Say, J S Mill and others started thinking of growing human basic demand and functioning of the economy in present and future. According to Classical, there is important role of value and distribution. J B Say highlighted the issue of balancing the economy through supply and demand including adjusting the employment and wage. Kates differentiated between Keynesian macroeconomics from classical approach. A model of the classical theory explains how pre-Keynesians view the function of the economy, and reasons of trade cycle. They ignored public expenditure based stimulus. Classical such as Adam Smith, JB Say, David Ricardo, Thomas Robert Malthus, and John Stuart Mill developed a theory of market economics as largely self-operational systems, where natural laws of production and exchange exists (Skousen, 2008). Adam Smith was a founder of classical. His book, The Wealth of Nations (1776), narrates that the wealth of an economy was determined by its national income, a composition of labor and capital reward in terms of wage and profit respectively and not by metals and gold. They minimized the role of the Government and believed in a *laissez faire* economy. Government may interfere when market operations are in crisis. There are demerits of monopoly profit, and so emphasised on the market competition including free trade. This isolated them from their predecessors, mercantilist, who advocated trade protection. John Stuart Mill viewed a stationary state of a static population size and fixed capital necessary for human beings to achieve. This is a steady-state economy which is in discussion of even in Harrod Domar Growth model. The model balances through Four variables saving propensity, capital output ratio, labor and technology i.e.

Later on, John Hicks (1967) & Samuel Hollander (1987) and others have presented formal views as part of their respective analysis of classical political economy. Classical economists established a theory of value, or price, to examine economic dynamics. In political economics, value usually refers to the value of exchange, which is separate from the price. Market prices are affected by many short-term influences and normally move towards natural prices as gravitational forces. Value of a product is sum total of wage and profit. Later on Ricardo added rent to be included in theory of value. Later on Sraffa added the production of commodities by means of commodities and hence derived value of products in mathematical manner. The Classical economists considered the growth of population (see, Malthus) as part of Political Economy. Seeing it then, the theory of population has been observed important in economics of population. Unlike dissimilarity to the Classical theory, the determinants of the neoclassical theory value are tastes, technology, and endowments. These determinants are seen as exogenous variable in neoclassical economic models.

Monetarists grew as the barter system reduced. Classical like Irving Fisher gave equation of relationship between money and prices in form of  $MV = PT$ . Banking both central and commercial started replacing money lenders and traders. In India nationalization of banks took place in 1969 in the first phase. Milton Friedman said banks should

control the supply of money. Money supply management will control price rise in the economy. Such views are supported by Dobb and Marx. Banking network is considered essential for faster growth. Beginning in the late 1960s, a new classical macroeconomics movement arose. They criticized Keynesian argument because of sticky wages and prices. In USA, Presidents Ronald Reagan and George Bush supported policies that were Keynesian, even though both were conservative leaders and tax cuts can provide very helpful fiscal stimulus during a recession as much as infrastructure spending can. Unfortunately banks show non performing asset. US based Lehmann brothers failed and brought recession in 2008-09 (Verma,2013).

### 5. Auto stabilization vs. Discretion

A debate later on started for auto stabilization of money supply, say three percent per annum which is equal to 3 percent growth. If this kind of policy is framed then economy may give good results and stabilize the economy. But sometimes *impromptu* policies are required because expected planning is not similar to actual outcome. Therefore, discretion before central bank or ministry of finance needs it. But often in India autostabilised planning is not preferred. Discretion gets preference, may be because of political agenda of the government. That is why Indian government did demonetization and implementation of GST in recent years. As a consequence growth rates have been badly affected (Verma, 2017, IJSSDP).

### 6. Class Interest Clash in Marxian Literature

Some left oriented economists, Marx, and Paul Sweezy highlighted the issue of class interest. Labor and capital are two components of production. The workers will fight for maximization of wages and capitalists will fight for profit maximization. Since wage and profit are equal to total production therefore clash is natural. In this scenario economy may face challenges of interest and hence conflict. When conflict occurs production and productivity declines. Some Marxist economists criticized Keynesian economics of public investment. New classical economics introduced a set of macroeconomic theories that were based on optimizing microeconomic behaviour. These models have been developed into the real business-cycle theory, which argues that business cycle fluctuations to a large extent are getting affected by real shocks (Marx, 1863).

### 7. Choices: Government vs. Private Investment

James M. Buchanan criticized Keynesian economics. In government there are many limitations of rules. No one dares to violate the rule. Sometimes a large group of people have to follow the rule. It takes a lot of time in taking final decisions. On the other hand private sector is controlled by few decision makers who immediately implement any policy and programmes. Thus public sector performance is less efficient whereas private sector investment is more yielding. Therefore, some economist criticized Keynesian for public investment. Corruption may be another drawback in Keynesian public investment. Even labor may not show efficiency because of liberal democracy. “if you face a trouble through politicians then criticize politicians instead of Keynes said Krugman. He also argued that empirical evidence makes it pretty clear that Buchanan was wrong” (See Keynesians views). Verma (1917) argued that hectic decisions in monetary policy through demonetization plus fiscal reform through GST affected the economy negatively. We observe that in Indian democracy rules are often violated.

### 8. Trade Cycle

Keynesian macroeconomics has been criticized by the “real business cycle theory” developed in the 1980. This theory showed a departure from most previous expectations about business fluctuations. Trade cycles did not indicate any failure of the market mechanism. It shows lack of balancing aggregate demand and aggregate supply functions. It also shows lack of coordination in implementation of monetary or financial factors, or other nominal variables, in amplifying business fluctuations. Certainly, real business cycle models view that monetary policy has basically no effect upon the economy, they therefore projected that the “classical dichotomy” of nineteenth-century monetary theory holds good still in the short run. Here also Hawtray pointed out to manage money for control of trade cycle. Trade cycle is a purely monetary phenomenon said Hawtray. But later on Schumpeter talked about innovation for handling trade cycle (Pratinidhi & Verma, 2018).

### 9. Rational Expectations

Malthus forecasted that population will grow in geometric progression and food will grow in arithmetic progression. So there will be a food crisis in the economy. This was based on adaptive expectations. Later on neo classical like Solow took importance of technology in resolving crisis. When human need will change the technology will fulfill that demand. Green revolution is such an example in agricultural sector. Therefore, rational expectations theory defines expectations as being the best estimates of the future requirements that uses all available information. There are two types of expectation- one measured by past events and other through forecasting. Forecasting gives better results because of updation. Expectation based on history i.e. adaptive expectation becomes outdated because it does not show emerging improvement in forecasting. Perfect information helps estimate optimal prediction or forecast. It is assumed that predicted outcomes do not differ systematically from the market balancing results. Therefore, rational expectations hardly differ from equilibrium point. For example, people would predict unemployment by looking at unemployment rate in previous years. This is a neo classical point. In 1970s, rational expectations appeared to have made previous macroeconomic theory largely obsolete Lucas (1973). Despite this, rational expectation theory has become popular as a forecasting model. In order to be able to compute expected values, individuals must know the factual model, its parameters, and the nature of the forthcoming issues, its econometric processing that lead to accuracy. If key extreme assumptions are violated, individuals simply cannot form rational expectations and then knowledge would be full of errors. Therefore rationality plays a crucial role in purity of knowledge derivation with forecasting. This matches producers' expectations and actual outcomes (Verma, 2019).

### 10. Contemporary Macro Concern

Falling growth, rising unemployment and growing skewed income are three major issues at present in populous Asian countries including India. While China has better governance and discipline India could not handle maintaining lower population growth rate and discipline in democratic set up. There are three major macroeconomic concerns in India. The first is growth flexibility increasing from 3.5 percent upto above 7 plus percent and now declining to below 5 percent (Verma, 1917, 2019 ).

### 11. Trends in GDP Growth

Figure-1 shows that since 2011-12, GDP growth rate is raised till 2016-17 but after that a declining trend is seen in the economy, major causes of it, are the demonetization and implementation of GST. Both made the investors unsure for investment (see, Verma: 2019 UPUEA Presidential address for details). .

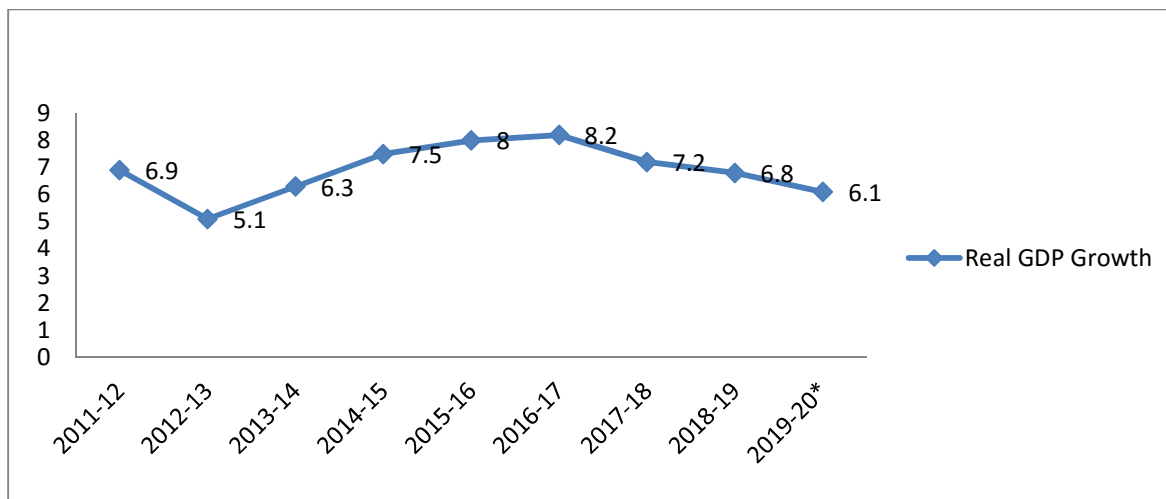
**Table 1: Annual Growth of GDP**

| Year            | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20* |
|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| Real GDP Growth | 6.9     | 5.1     | 6.3     | 7.5     | 8       | 8.2     | 7.2     | 6.8     | 6.1      |

\*Projected Figure, RBI

Source: Central Statistics Office (CSO)

**Figure 1: GDP Growth**



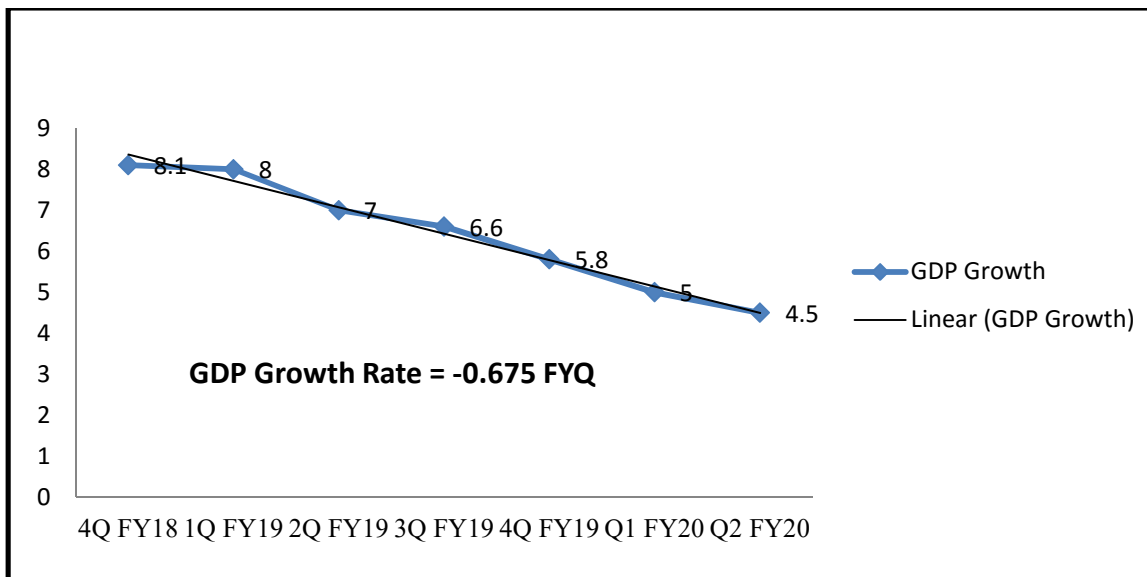
\*Projected Figure, RBI

Source: Central Statistics Office (CSO), Verma, 2019(UPUEA)

**Table 2: Quarterly Growth Rate for the Last Six Quarters**

| Quarter    | 4Q FY18 | 1Q FY19 | 2Q FY19 | 3Q FY19 | 4Q FY19 | Q1 FY20 | Q2FY20 |
|------------|---------|---------|---------|---------|---------|---------|--------|
| GDP Growth | 8.1     | 8       | 7       | 6.6     | 5.8     | 5       | 4.5    |

**Figure-2: Quarterly Growth Rate for the Last Six Quarters**



Source: Central Statistics Office (CSO), various issues, Verma, 2019 (UPUEA)

In figure 3, it is shown that there is a negative growth rate in the economy. It is declining with average rate of 0.675 percent in last six quarters. This is indicating that there is slowdown in the economy. It is a demand pulled slowdown because there is lack of demand in the market (see, Verma, 2019 UPUEA Presidential address for details). . .

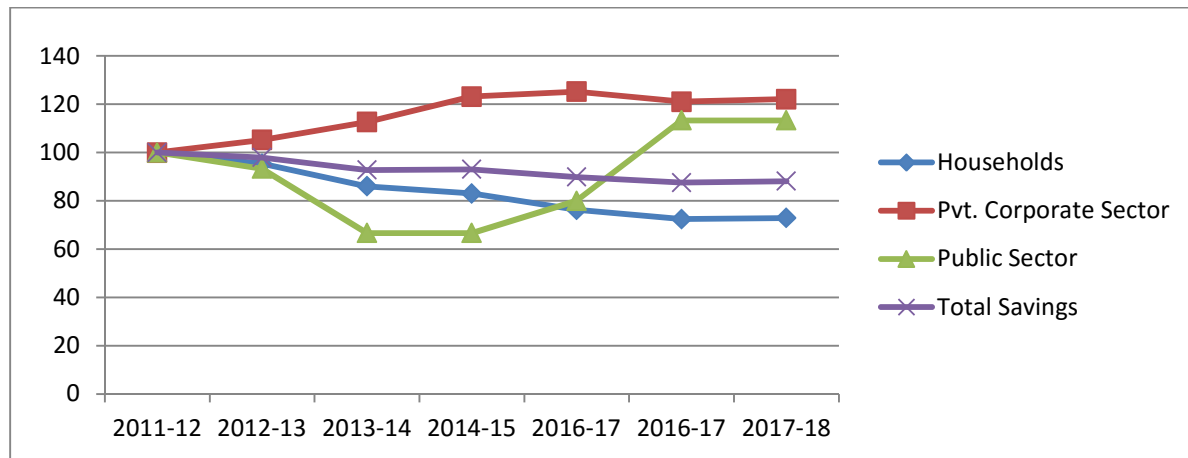
## 12. SAVINGS

**Table-3: Gross Savings and its Components**

| Year    | Households | Pvt. Corporate Sector | Public Sector | Total Savings |
|---------|------------|-----------------------|---------------|---------------|
| 2011-12 | 23.6       | 9.5                   | 1.5           | 34.6          |
| 2012-13 | 22.5       | 10                    | 1.4           | 33.9          |
| 2013-14 | 20.3       | 10.7                  | 1             | 32.1          |
| 2014-15 | 19.6       | 11.7                  | 1             | 32.2          |
| 2016-17 | 18         | 11.9                  | 1.2           | 31.1          |
| 2016-17 | 17.1       | 11.5                  | 1.7           | 30.3          |
| 2017-18 | 17.2       | 11.6                  | 1.7           | 30.5          |

Source: Central Statistics Office (CSO), Various Issues, Verma, 2019 (UPUEA)

**Figure-3: Gross Savings and its Components (in deflator)**



Source: Processed from Central Statistics Office (CSO) data.

In figure-3, for showing the relative changes among the variables, deflator is used, year 2011-12 is taken as the base year. Since 2011-12 to 2017-18 year, it can be seen that private corporation sector and public sector are having some savings, whereas households' saving are declining. And it is also seen that after 2016 all sectors' saving are declining except public sectors. The causes are same: demonetization and GST implementation.

## 13. INVESTMENT

### 14.

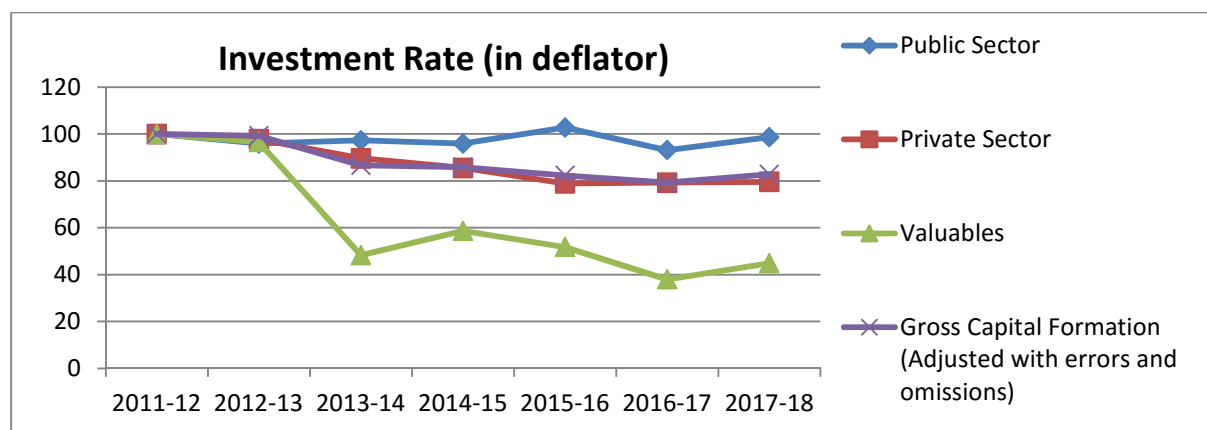
**Table -4: Investment Rate (Gross Fixed Capital Formation as % of GDP)**

| Year    | Public Sector | Private Sector | Valuables | Gross Capital Formation |
|---------|---------------|----------------|-----------|-------------------------|
| 2011-12 | 7.3           | 27             | 2.9       | 39                      |
| 2012-13 | 7             | 26.4           | 2.8       | 38.7                    |
| 2013-14 | 7.1           | 24.2           | 1.4       | 33.8                    |

|         |     |      |     |      |
|---------|-----|------|-----|------|
| 2014-15 | 7   | 23.1 | 1.7 | 33.5 |
| 2015-16 | 7.5 | 21.3 | 1.5 | 32.1 |
| 2016-17 | 6.8 | 21.4 | 1.1 | 30.9 |
| 2017-18 | 7.2 | 21.5 | 1.3 | 32.3 |

Source: Central Statistics Office (CSO), Verma, 2019 (UPUEA).

**Figure-4: Investment Rate (Gross Fixed Capital Formation as % of GDP)**



Source: Processed from Central Statistics Office (CSO) data, various years

In the figure-4, for showing the relative changes among the variables, deflator is used, for it 2011-12 is taken as the base year. The public policies can affect the economy easily and it shows in the figure-4 (see, Verma:2019 UPUEA Presidential address for details).

## 15. UNEMPLOYMENT SCENARIO:

**Table-5 Unemployment rate (%) according to usual status (PS+SS) and CWS during 2017-18 (PLFS)**

| Unemployment rate in percent according to usual status (PS+SS) and CWS during 2017-18 (PLFS) |              |      |        |         |
|--|--------------|------|--------|---------|
|  | Status       | Male | Female | Persons |
| Rural  | Usual Status | 5.8  | 3.8    | 5.3     |
|  | CWS          | 8.8  | 7.7    | 8.5     |
| Urban  | Usual Status | 7.1  | 10.8   | 7.8     |
|  | CWS          | 8.8  | 12.8   | 9.6     |
| Rural+Urban  | Usual Status | 6.2  | 5.7    | 6.1     |
|  | CWS          | 8.8  | 9.1    | 8.9     |

Source: NSS Rounds and PLFS, Verma , 2019 (UPUEA).

The periodic labour force survey 2017-18 came out with unemployment level in the country at 6.1% for rural-urban combined. Rising unemployment combined with high growth rate in recent years suggests a production regime when capital resources are leveraged more than the labour. This deleveraging of labour force has certainly resulted in moderation of demand which in the recent months have aggravated and the growth rate in the last five quarters have been declining.



## 16. Fiscal Policy for Correcting Skewed Inequality

Market is escalating inequalities of income, health, education and citizenship, asset and wealth. These pose the gravest threat to future social, economic, and political stability. To correct it, we need a much better understanding of conceptual relationship among discrimination, stigmatization and inequalities. For India, the Gini coefficient for income was 35.7 in 2010-11 which has gone up above 47 now. The study of (Piketty 2015, Verma, 2019 Presidential address) is well known. There is concentration of inequality in India (47.3), South Africa (57.8), Brazil (53.3), Turkey (41.9), Sri Lanka (39.8), China (38.6), as well as countries like USA (41.5), which are otherwise ranked very high in terms of HDI (Verma, 2019 UPUEA).

Inequality of all types in India is largely a result of chronic socioeconomic features. It caters better to the privileged people and limit opportunities for those who are marginalized. Inequalities in wealth and income distribution lies at the root of rising inequalities in India. Increasing concentration of physical and financial assets in the hands of the few have resulted in large scale impoverishment across the country. The unorganised sector which includes mostly the daily wagers working in agriculture, construction, manufacturing, petty trade, informal sector and MSMEs is one of the largest sectors of employment in India, but ironically, also the most vulnerable one. Workers in this sector remain deprived of their basic labour rights and social security, and often work at less than the stipulated minimum wage norms. Over the last several decades, real wages did not rise at the same level as the rate of growth in GDP. This implies that the larger section of the population, the wage-earners, have not been able to get the benefits of a ongoing rate of growth (Verma, 2014, 2019 UPUEA and Verma & Srivastava, 2020, forthcoming).

Discrimination based on marital status, caste-affiliation, sexual orientation, single or multiple disability, religion, or food preferences do not come within the purview of law. The constitution and relevant laws do prohibit the practice of untouchability, in practice, however, they do not address issues when a private landlord declines to let out his house to dalits, minorities, transgenders, or non-vegetarians. The law also does not fully cover situations where discrimination on different reasons is practiced in private and public organizations, voluntary organizations, NGOs, educational institutions, public health centres, and Panchayatiraj institutions. The anti-discrimination bill brings all these entities within its ambit, and many more issues to ensure better well-being of the Indian citizens (Verma, 2002, 2007; Verma & Srivastava, 2020 forthcoming).

Unequal access to healthcare as reflected in poor health indicators shows miserable public health system in India. Government spending on healthcare in India for a long time has been far below the required level. The healthcare inequality arises due to skewed resource allocation, limited access to quality health services and inadequate human resources for health, high out-of-pocket health expenditures, costly health spending inflation, and user's behavioral factors which affect the demand for proper health care. Major priorities for the future include money-lending, especially in rural areas, to break the cycle of poverty and debt, breakdown of the caste system and improving the education and opportunities for women ( Verma, 2014; Devi and Verma, 2019).

Inequalities also arise by gender. They are seen in various forms in social sector such as healthcare and education, female feticide, political representation and access to land and labour markets. One needs to challenge the matriarchal/ patriarchal norms that reinforce stereotypes about women, rendering them as dissimilar citizens. It is essential to say that analysis of social inequalities in gender perspective and delivery of public services are crucial in understanding the deep influence that such public and social biases promote (Verma, 1998, 2000, Verma & Srivastava, 2020, Routledge, Forthcoming).

## 17. Other Emerging Social Concern

### 18.

#### (i) India's Ranking in Global Hunger Index

In 2000, India was ranked 83 out of 113 countries. Now, with 117 countries in the fray, it has dropped to 102th rank. It's GHI score has also decelerated -- from 38.9 in 2005 to 32 in 2010 and then from 32 to 30.3 between 2010 and 2019.

**Table-5: India's ranking in Global Hunger Index**

| year | India's ranking in Global Hunger Index | Total number of countries |
|------|--|---------------------------|
| 2011 | 108                                    | 122                       |
| 2012 | 106                                    | 120                       |
| 2013 | 105                                    | 120                       |
| 2014 | 99                                     | 120                       |
| 2015 | 93                                     | 117                       |
| 2016 | 97                                     | 118                       |
| 2017 | 100                                    | 119                       |
| 2018 | 103                                    | 119                       |
| 2019 | 102                                    | 117                       |

Source: theglobaleconomy.com, downloaded 18.12.19

(ii) **Corruption Perceptions Index (CPI)**

The Corruption Perceptions Index (CPI) is an index published annually by Transparency International since 1995 which ranks countries "by their perceived levels of public sector corruption, as determined by expert assessments and opinion surveys." The CPI generally defines corruption as "the misuse of public power for private benefit." The details are given in Table 6 and Table 7. India is perceived as more corrupt.

**Table-6: Scale for Corruption in the World**

| Scores | Perceived as less corrupt |             |             |             |             | Perceived as more corrupt |             |             |             |             |
|--------|---------------------------|-------------|-------------|-------------|-------------|---------------------------|-------------|-------------|-------------|-------------|
|        | 100–<br>090               | 089–<br>080 | 079–<br>070 | 069–<br>060 | 059–<br>050 | 049–<br>040               | 039–<br>030 | 029–<br>020 | 019–<br>010 | 009–<br>000 |

**Table-7: Corruption score by India out of 176 countries**

| years | Corruption score |
|-------|------------------|
| 2012  | 36               |
| 2013  | 36               |
| 2014  | 38               |
| 2015  | 38               |
| 2016  | 40               |
| 2017  | 40               |
| 2018  | 41               |

Source: theglobaleconomy.com, downloaded, 18.12.19

(iii) **India: Happiness Index, 0 (unhappy) - 10 (happy)**

For happiness indicator, The World Happiness Report provides data for India from 2013 to 2019. The average value for India during that period was 4.38 points with a minimum of 4.02 points in 2019 and a maximum of 4.77 points in 2013. See the global rankings for that indicator in table 8. As shown in table 8 India's score for happiness is also showing a decline during 2013-19.

**Table-8: India's score for happiness**

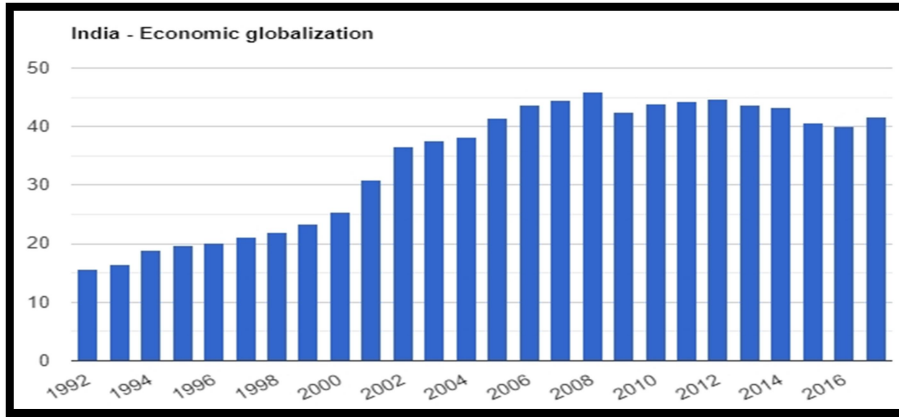
| years | India's score for happiness |
|-------|-----------------------------|
| 2013  | 4.77                        |
| 2015  | 4.57                        |
| 2016  | 4.40                        |
| 2017  | 4.32                        |
| 2018  | 4.19                        |
| 2019  | 4.02                        |

Source: theglobaleconomy.com, downloaded, 18.12.19

(iii) **India: Economic Globalization Index (0-100)**

For economic globalization indicator, The Swiss Institute of Technology in Zurich provides data for India from 1970 to 2017. The average value for India during that period was 25.21 points with a minimum of 13.84 points in 1970 and a maximum of 45.86 points in 2008. See the global rankings for that.

**Figure-5: India in Economic Globalization Score**

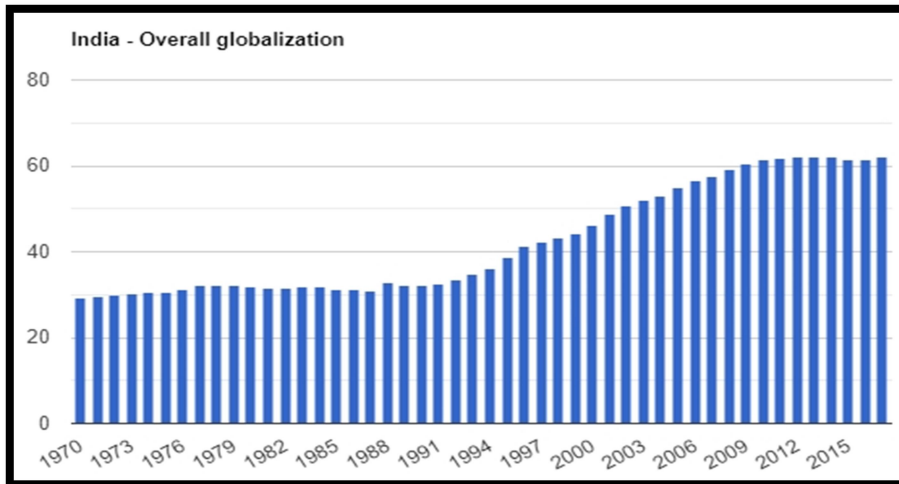


Source: theglobaleconomy.com, downloaded, 18.12.19

(iv) **India: Globalization index (0-100)**

For this indicator, The Swiss Institute of Technology in Zurich provides data for India from 1970 to 2017. The average value for India during that period was 42.49 points with a minimum of 29.34 points in 1970 and a maximum of 62.25 points in 2017. See the global rankings for that indicator or use the country comparator to compare trends over time.

**Figure-6: India in Globalization Score**



Source: theglobaleconomy.com, downloaded 18.12.19

(v) **India: Human Development Index (0 - 1)**

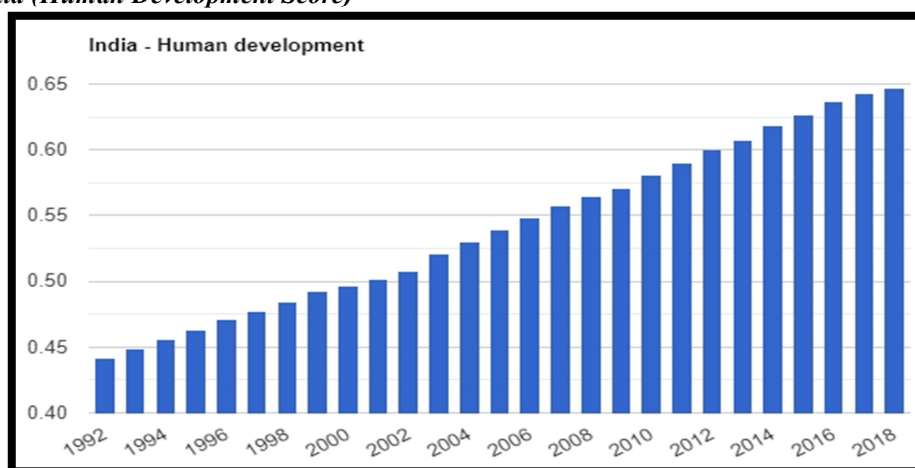
For HDI indicator, The United Nations provides data for India from 1980 to 2018. The average value for India during that period was 0.529 points with a minimum of 0.369 points in 1980 and a maximum of 0.647 points in 2018. See the global rankings for that indicator (Figure 5).

**Table-9: India (Human Development Score)**

| Year | HDI score | Year | HDI score |
|------|-----------|------|-----------|
| 1992 | 0.442     | 2006 | 0.548     |
| 1993 | 0.449     | 2007 | 0.558     |
| 1994 | 0.456     | 2008 | 0.565     |
| 1995 | 0.463     | 2009 | 0.571     |
| 1996 | 0.471     | 2010 | 0.581     |
| 1997 | 0.477     | 2011 | 0.590     |
| 1998 | 0.484     | 2012 | 0.600     |
| 1999 | 0.492     | 2013 | 0.607     |
| 2000 | 0.497     | 2014 | 0.618     |
| 2001 | 0.502     | 2015 | 0.627     |
| 2002 | 0.508     | 2016 | 0.637     |
| 2003 | 0.521     | 2017 | 0.643     |
| 2004 | 0.530     | 2018 | 0.647     |
| 2005 | 0.539     |      |           |

Source: theglobaleconomy.com, downloaded, 18.12.19

**Figure-5: India (Human Development Score)**



Source: theglobaleconomy.com Downloaded 18.12.19

## 19. Conclusion

The economic theory in macro perspective has gone several changes from agricultural based Physiocrats economy to commercialization based mercantilists economy. Consequently classical argued for value and distribution and growth of the economy. Then emerged Keynes during Great Depression and argued for public investment. Later on Hollanders and US presidents and Indian economists supported Keynesian views during recession. Because of expanding growth of capitalism, monetarists argued for money supply management. It was rational expectation theorists who gave importance to accuracy in data forecasting. Even today we give importance to key variables such as public investment of Keynes, money supply management of monetarists, and rational perspective planning. Classical distribution theory is still relevant in valuation and redistribution analysis. The opinion of Karl Marx that labor will become capitalists still seems a distant dream. However, the argument of Passinetti holds good. The labor can save and invest.

At the time of Independence in 1947, India had many social, political, economic and institutional problems like; public financing, national debt, partition of the nation, internal national issues, hunger and corruption. Till today, with high potentials it is growing. Today, India is above a developing country. It is not developed till date but,

no doubt, it is an emerging economic power. Despite the fluctuating growing economy and being an economic power, India has many socioeconomic problems today. Economic growth that spreads its benefits equitably among the people is always appreciable. Growth that is distributed unequally needs to be evaluated not simply on the basis of overall change, but on the ground of equity. There are two reasons to understand the skewed income and wealth distribution. First, there are sympathetic and ethical grounds for reducing inequality. There is no reason why individuals should be viewed differently in terms of their access to economic resources. People make preference over the course of their lifetime for which only they are held responsible. They are poor because of the “lack of opportunities.” In many cases this may indeed be true, but in many cases the unequal treatment begins from the beginning. It is concluded that despite rising macroeconomics knowledge during (1750-2020) the economy of India is facing economic miseries, hunger despite food security act, corruption despite anti corruption laws and detecting agencies, unhappiness and lower human development. The economy should control rising population, hence balancing Keynesian type effective demand and show rationality, monetarism, efficiency in value generation, matching Harrod-Domar type actual and expected growth, short and long run stability, sustainability and redistribution.

#### Acknowledgement

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#### Notes

1. See, Cochrane (1970), Hollander (1987) for Classical Macroeconomics.
2. See Ambrosi (2003) for classical and Keynesian views.
3. See, Devi and Verma(2019) for health status and inequality especially for elderly.
4. See, Ernesto Screpanti and Stefano Zamagni (2005) for thoughts.
5. For gender issues, see two papers of Verma &Srivastava( Routledge, forthcoming).
6. For recession, macro instability and recent slowdown, Philips curve, growth and employment see, Verma`s papers.
7. See, Marx for Class conflict and surplus value (1863).
8. See , Kates (2016) for comments on classical.
9. See, Hicks(1967) for monetary theory.

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## 15. GEOGRAPHY

### 0315025 PANDA, GOPAL KRISHNA (P.G.Department of Geography, Utkal University, Bhubanewar). CLIMATE CHANGE, COASTAL VULNERABILITY AND LIVELIHOOD ADAPTATION - SOME OBSERVATIOS FROM EAST COAST OF INDIA

This study examines the impact of climate change on the livelihood of the coastal communities and specifically the low and marginal farmers and fisherman community along Odisha coast. It is a qualitative study using structural questionnaires, participatory rural appraisal (PRA), key informant interviews, and secondary sources using the principle of sustainable livelihood approach (SLA). The changing scenario of climatic events has also been perceived in terms of climate exposures and sensitivity. The study reveals that the climate change and variability has not only affected occupational activities but also hampers multifarious aspects of rural livelihoods. Capacity building of communities is considered effective for enhancing climate-resilient communities as well as for adapting to changes in climate variability.

**Keywords: Climate Change; Climate Variability; Livelihoods; Coastal Community**

#### Introduction

The natural resource dependent livelihood practices of coastal communities are becoming increasingly vulnerable and are seriously challenged due to the climate changes across the globe. Extreme events such as cyclones, tidal surges, coastal flooding, saline inundation and coastal erosion have been severely affecting the livelihood of the people and more specifically the coastal agriculture and fishing. Coastal communities had remained extremely vulnerable to disasters that impeded the key livelihoods in the coastal areas than any other place due to the recent climate changes. The traditional agriculture and cropping patterns are changing in the coastal areas due to variation of fresh water and salinity level and increasing abrupt weather events, tidal inundations, water logging and climatic variations. The coastal dwellers are lacking of climatic information, improved and resistant crop varieties and diversified livelihoods to continue adaptation practices. Particularly the people below poverty line, marginalized and landless daily wagers who have limited access to natural, social and institutional services of local Govt. institutions are losing adaptive capacity in the long-run.

This paper presents the community perception of climate change and livelihood adaptation practices of some selected coastal communities of Odisha. Particular emphasis is given on an innovative livelihood model - Forest, Fish and agriculture which shows integrated community based livelihood practices for short, medium and long-term adaptation. The study highlights for improving the livelihood practices in a way that incorporates climatic risks in resource management and enhancing adaptive capacity of coastal community. Strengthening local institutional capacity to enabling collaboration between stake holders and community effectively bring diversity of knowledge in climatic risk reduction measures, cost-effective implementation of the new adaptation technology and ensure social equity and empowerment in the access to livelihood resources. The study suggests that collective livelihood practices can create pro-active attitudes, learning opportunity and participatory decision-making which are important for claiming and disseminating best practices and facilitating adaptation across the community.

Fisheries have been a traditional livelihood option for many people residing along the coast. But however, the livelihood of the fishing coastal communities have been vulnerable to various climatic shocks ranging from the extreme weather events like cyclone, floods, droughts to sea-level rise, river bank erosion, heat waves and fluctuating rainfall. Structure and productivity of marine and coastal eco-systems and fish populations are seriously affected by increasing temperatures, altered precipitation patterns, sea-level rise, ocean acidification and changes in dissolved oxygen concentration (Johannessen & Miles, 2011). People dependent on fisheries of some regions of the earth have already been impacted by these (Perry et.al, 2009) climate change processes. Extreme weather events such as cyclones and floods further intensify these impacts by disrupting fishing operations ( Westlund et. el, 2007). Small-scale fisher communities are considered especially vulnerable to the negative impacts of climate variability and change (Adger et. el ,2007).

Like most other developing countries the people of India to a large extent dependent on natural ecosystem and resources for their livelihood sustaining primarily agriculture, livestock, fishery and forestry. Therefore any adverse impact on the natural resources will have serious repercussion on the economy of the people and widen the gap between rich and the poor. It is more so in the context of coastal community given the climate sensitive nature of their livelihood system. The analysis of time series meteorological data establishes moderate change in climatic variables that interestingly corroborates to community perception at local level. For the very fact that climate change is happening and continues well into the future with considerable adverse impact on human as well as natural ecosystem, there has been consensus among various stake holders to initiate appropriate mitigation and adaption measures to deal with these adverse impacts.

It has been observed that the present mitigation and adaptation measures are more focused to “rapid on-setting” natural hazards as the primary management objective. However potential threats of “slow onset” disaster like climate change, sea level rise, coastal erosion and water quality degradation remain largely on attended to. Though research initiatives are afoot on physical and biological sciences, it is imperative to assess the climate change from socio-economic perspective to prepare a road map for capacity building of people for effective adaptation and mitigation of adverse effects of sustainable livelihood and development. The uncertainty over the patterns of changes in climate variables and the presence of an array of non-climatic stresses complicates the understanding of these changes and its impact on rural livelihood systems and the adaptation capabilities of coastal communities. This study makes an attempt to explore how climate change is affecting the livelihood systems, perception of people about such changes and the adaptation strategies of the coastal communities of Odisha..

### **Climate change and coastal Livelihood System**

According to Chambers and Conway a livelihood “comprises the capabilities, assets (including both material and social resources) and activities required for a means of living”. The assets are merely the means and need to be complemented by capabilities to enable people to earn their livelihood. The activities that earn a livelihood are critically dependent on assets, capabilities and entitlements which in turn are regulated by governing economic, social and political institutions. Therefore a livelihood constitutes the assets, activities and related socio-economic and ecological factors that enable people to earn a living. The notion of sustainable livelihood has been introduced by the Brundtland Commission in 1987 in terms of its reference to the resource ownership pattern and its impact on access to basic needs and livelihood security. One of the widely accepted definition of sustainable livelihood is “A livelihood could be termed sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in future while not undermining the natural resource base. Following this definition, there is substantial evidence to demonstrate that the livelihoods of the coastal community are becoming increasingly unsustainable.

Communities across diverse ecosystem experience change in pattern of rainfall and temperature to a large extent different from what they experienced a few decades before. There are also a number of changes in the activities and the resources communities depended upon to make a living. The response of the communities to these diverse changes in livelihood system implies the coping and adaptive capacity of the community. The literature often differentiates between coping and adaptation based on the time scale of these responses. The short term actions are deemed as coping whereas long term actions are termed adaptation. Adaptation is the ability to respond and adjust to actual or potential impacts of changing climatic conditions in ways that moderate harm or takes advantage of any positive opportunities that the climate may afford. It includes policies and measures to reduce exposure to climate variability and extremes and the strengthening of adaptive capacity. Adaptation can be anticipatory whereas systems adjusts before the initial impacts take place or it can be reactive, where change is introduced in response to the onset of impacts with poor being more directly dependent on ecosystem services and products for their livelihood, the vulnerability of nature has profound implications.

In relation to climate change vulnerability is related to direct effects such as more storms, lower rainfall or sea level rise that lead to displacement and to indirect effects such as lower productivity from changing ecosystem on disruption to economic systems. It is established that increased climatic variability would further induce increased frequency of natural calamities changing in the sea level, increased vector borne diseases and so on. The



changes would squeeze the livelihood options further. The poor being more dependent on ecosystem services and products for livelihood will be more vulnerable to climatic variation. Therefore, there is a need for reasonable adaptive strategy. In current discourses of adaptation strategies some scholars view adaptation as a matter of management and creation of adequate physical infrastructures to minimize the adverse impacts whereas another group of scholars are emphasizing upon poverty alleviation a more effective adaptation measure (Poavola, 2010) as it enhances the capability of the community to cope and adopt to the changing environment.

The ability of the poor people to be resilient to climate induced vulnerability depends on the capacity to withstand the impact of the trends and shocks of extreme climatic events, absorbing them while maintaining function. Resilience is determined by two characteristics of people livelihood – the assets they possess and services provided by external infrastructure and institutions. Assets include the amount and quality of knowledge available to the house hold, the physical and financial capital they possess, their social relations and access to natural resources. External services include those provided by flood control, coastal protection, infrastructure, access to credit & financial institutions etc. The poor having limited access to external services is more dependent on local asset base.

The coastal zone of India is extremely vulnerable to climate change induced fast and slow on-setting natural hazards and disasters. India's population living around coast line are mostly dependent on climate sensitive livelihood options like agriculture, animal husbandry, fishery and non-timber forest produces. The variation of climatic conditions are likely to alter hydrological cycle, affect the agricultural productivity, spread of malaria and other vector borne diseases, intensify desertification and shift in forest types. It is important to understand the trends of localized change and its impact on livelihood system for effective mitigation measures and development.

Odisha's coastal zone has the distinctive opportunities, diversified threats and vulnerabilities. This zone has enormous potentials in terms of natural resources but are often lagging behind in socio-economic development and vulnerable to different disasters, environmental degradations, and global climate changing processes. For the developing nation like India where the climate change process takes a shape of natural disaster that not only affects the socio-economic condition of coastal communities but also are creating new poverty traps. In rural communities of remote coastal areas their live and livelihood depend on climate-sensitive occupations such as fishing, farming, and forestry which are closely linked to people's lifestyles. The natural disasters in the form of flood or cyclone as a result of climate change has a direct impact on costal socio-economic structure, land-use pattern, natural resources and livelihoods of the coastal community [9]. This study aims to assess the impact of climate change on the livelihood of the coastal communities of the Odisha coast.

### **Objective of the study**

The study owes its origins to a major concern that climate change is a global phenomena but however it is important to understand the local experiences of climate change and its impact on livelihood. The study is based on the premises that local communities can perceive the effects of climate change based on their historical understanding of the changes in the local weather. It is also presumed that their involvement to address climate change is a necessary pre-requisite for meaningful outcome. Thus the study also aims to explore the capacity of the communities to cope with climate change.

### **Study Area**

#### **(a) Odisha Coastal Zone and its Geo-ecological Background**

Odisha has 480 km of coastline extending from the Andhra-Odisha boarder in the south up to the Odisha-West Bengal boarder in the north spreading over six coastal districts. Along the coastline there lies the northern coastal plain between the Subarnarekha and the Dhamra river covering the districts of Baleswar and Bhadrak, the central delta region of the Mahanadi, Brahamani, and Baitarani spreading over the districts of Kendrapara, Jagatsinghpur and Puri and the narrow southern plains covering the coastal sections of Ganjam district. The Chilika Lake along the coast remains between the Puri and Ganjam plains spreading along the coast over an area of nearly

1100 Sq Km . Odisha coastal zone has a wide range of ecosystems of coastal plains, mangrove forests, alluvial flood plains, diverse biodiversity habitats and livelihood groups who frequently coexist within the same area.

Along the coast extensive sand deposits in the form of ridges have been developed by the strong S.W winds. The land ward side of the shore is occupied by the widespread braided streams, ox-bow lakes, palaeo-channels, flood plains, natural levees, back swamps, lagoons and ancient beach ridges. The littoral zone of the coast extends for about 5 to 10 km inland from the shore. It is a zone of braided, sluggish and brackish streams, tidal creeks, sand ridges and dunes, back swamps and mud flats. This zone is often called as the “Salt Tract” (Sinha, 1995). The deltaic and riverine plains of older and younger alluvium follow this zone inwards which varies from 50 to 100 km. Most of the major rivers of Odisha originating from and beyond the Eastern Ghats drain to the Bay of Bengal through this coastal tract. The combined arcuate delta of the Mahanadi-Brahmani-Baitarani rivers extending over nearly 10,000 sq.km. area is the most prominent feature of the Odisha coast. This zone merges westward with the submontane tract of the Eastern Ghats. But longitudinally the coastal zone by and large consists of a micro-tidal region from the Andhra boarder up to the mouth of the river Devi, a meso-tidal zone from the Devi mouth up to the Dhamra mouth and a Macro-tidal zone from the Dhamra mouth up to the Subarnarekha mouth in the north along Baleswar coast. The coast has well developed sandy beaches in the south and muddy beaches in the north and mangrove swamps in the middle deltaic front in the river mouth zones of Brahmani and the Baitarani. Odisha coastal zone has been endowed with the geo-resources like extensive sandy and muddy beaches, lacustrine and estuarine stretches, mud flats, mangrove swamps and tidal flats, coastal plantation belts, back swamps, tidal creeks, coastal plains and off shore islands with varied ecological habitats had supported a wide variety of traditional livelihood options and recent alternative options like eco-tourism and commercial shrimp farming.



Fig. 1: Bhadrak coast showing dense vegetation along the shore followed by aquaculture ponds on the back shore and Dhamra estuary to the south

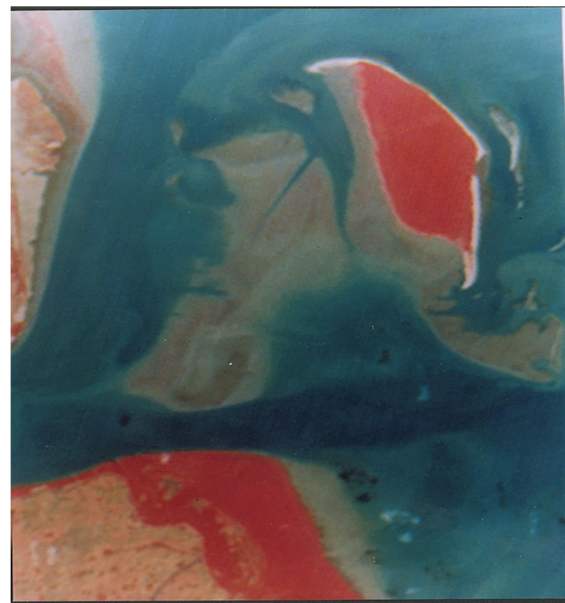


Fig. 2: Dhamra river mouth showing dense vegetation along with the appearance of off shore islands and shoals



Fig. 3: Mahanadi river mouth and the tidal creeks around it.

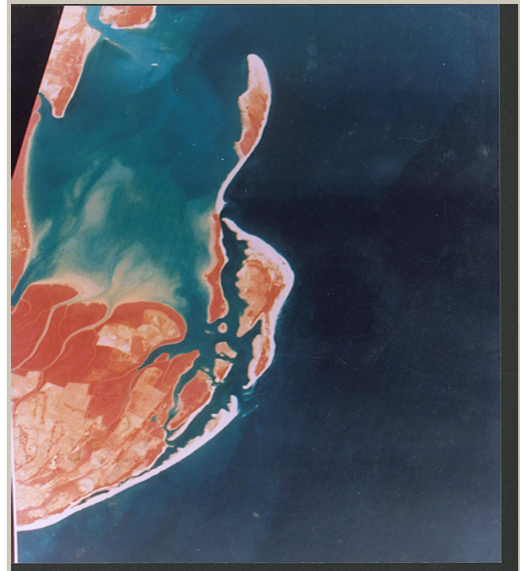


Fig. 4: Hukitola Bay in the Mahanadi river mouth with projecting deltaic lobes and tidal creeks.



Fig.5: Chilika and its surrounding showing its creeks and the long sandy spit separating it from the sea.

## (b) Population, settlements and climate sensitive livelihood activities along the coast

The state has a significant percentage of population living in rural areas i.e. 83.82 per cent against national average of 68.84 (2011 census). As per Economic Survey 2010-11, agriculture and Animal Husbandry section contributes 21.11 per cent of the Net State Domestic Product (NSDP) in 2007-08 as per 1999-2000 prices and provides employment directly or indirectly to 70 per cent of the total work force of the state as per 2001 census. Similarly fishery sub-sector contributes 6 per cent of GSDP of agriculture sector with nearly 2.95 per cent of the population (10.84 lakh, 2001 census) depending on fishery and 3.34 lakh depending on marine fishery. This shows the dependence of huge population on climate sensitive livelihood activities like agriculture, animal husbandry, fishery and allied sectors.

Small and marginal farmers constitute 53 per cent of the community who for their endemic poverty give little input to agriculture. The per capita availability of cultivated land was .039 hectare in 1950-51 which has declined to 0.13 hectare in 2007-08. Agriculture is now characterised with low productivity due to subsistence agriculture practices, inadequate capital formation, low investment and inadequate irrigation (34 per cent). To add to that repeated failure and production loss in traditional land based farming due to host of climatic factors like erratic rainfall (late arrival, early cessation, uneven distribution etc.) increase in saline inundation by storm surges and a host of human centric factors – non-functioning sluice-gates, breach in weak saline embankment and no embankment etc.) have rendered agriculture highly undependable in the coastal track triggering low investment, migration, change of option etc. Still paddy is the single most important crop cultivated in the area although people are gradually opting for diversified livelihood option with other crops and other economic activities. Population, settlements and fishing villages of coastal Odisha are given below in Table-1

*Table - 1: Administrative units, fishing villages and % of BPL families in the coastal districts of Odisha*

| Name of the District | Total Number of units |      |          | Total Numbers along the coast |     |                  | % of BPL Families to rural families |
|----------------------|-----------------------|------|----------|-------------------------------|-----|------------------|-------------------------------------|
|                      | Blocks                | GPs  | Villages | Blocks                        | GPs | Fishing Villages |                                     |
| Baleswar             | 12                    | 257  | 2971     | 7                             | 34  | 213              | 74                                  |
| Bhadrak              | 7                     | 166  | 1307     | 2                             | 19  | 109              | 67                                  |
| Kendrapara           | 9                     | 205  | 1532     | 2                             | 8   | 85               | 53                                  |
| Jagatsinghpur        | 8                     | 165  | 1391     | 3                             | 26  | 79               | 60                                  |
| Puri                 | 11                    | 204  | 1714     | 4                             | 16  | 75               | 55                                  |
| Ganjam               | 22                    | 444  | 3171     | 4                             | 13  | 28               | 69                                  |
| Total                | 69                    | 1441 | 12086    | 22                            | 116 | 589              | -                                   |

## 2. Methodology

### (a) Sustainable Livelihood Approach (SLA).

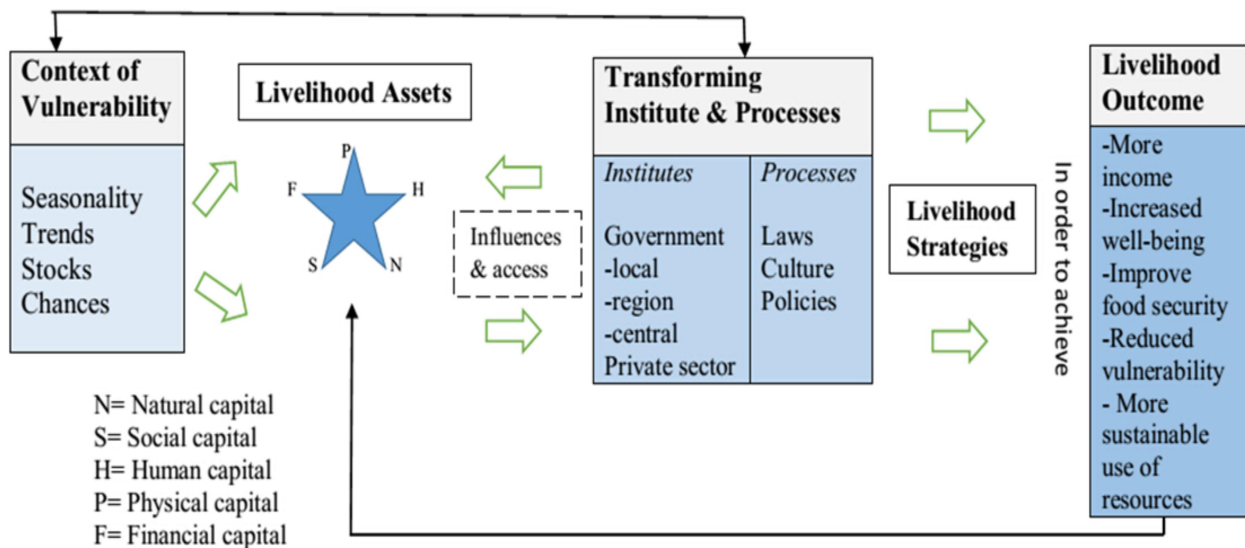


Fig.6. Sustainable Livelihood Framework. (Adapted from Morse and McNamara, 2013)

The methodology of the present study is based on sustainable livelihood approach (SLA), which is an effort to understand climate change impact and adaptation at the community level. The application of SLA in the form of climate change impact and adaptation helps researchers and practitioners identify pressing constraints and positive strengths of climate resilience livelihoods in rural areas overlaps between micro and macro links [15]. The framework of SLA comprises three components: livelihood asset (natural, financial, social, human and physical capital), vulnerability context (vulnerability analysis) and structure & process (institutional analysis). The SLA framework is too broad to be applied to the field situation especially the application is very limited in the area of fisheries at field level [16]. There is a need to apply the SLA in a much narrower and more precise term. In this respect, this study tries to put the principle of the SLA into the discipline of community based climate change impact and adaptation in a specific way, enabling to compensate for the weakness of the SLA.

### (b) Study Area and Sample Villages

The study was conducted in the coastal zone of Odisha at selected locations which are more prone to devastating impact of climate change. The study was conducted by adopting both multiple data collection methodology, a questionnaire survey, interview of key informants and Rapid Participatory Appraisal. The trends of climatic variable like rainfall, temperature, humidity etc. are analyzed using simple statistical methods. The data on other climatic variables like incidents of natural calamities and other economic and demographic data are collected from the secondary sources.

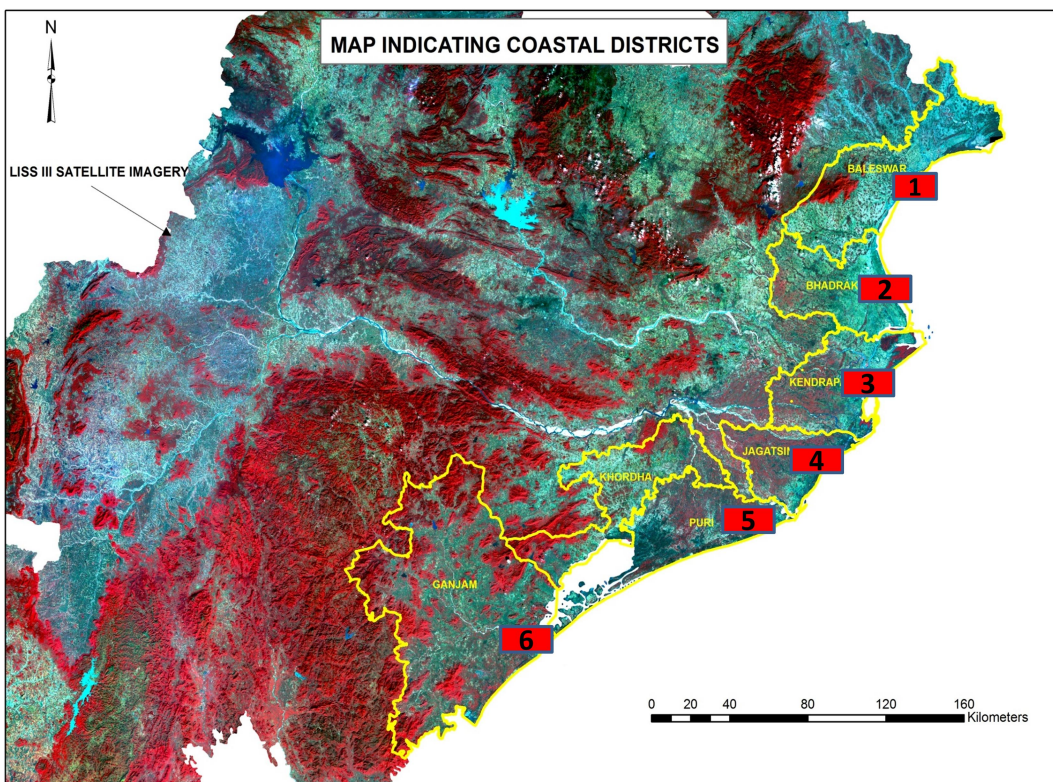


Fig. 7. Location of villages along Odisha coast where perception study was under taken

The study has been conducted in selected locations in six coastal districts of Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri and Ganjam (Fig.-7). These coastal districts cover 15 per cent of the total land area of the state and 35 per cent of the state's population with an average population density of 474 persons per km<sup>2</sup>. For field survey on people's perception of climate change and impact of climate change on livelihood six villages were selected one from each coastal district considering the potential impact of climate change in the area. Thus, six villages were selected for the study. Sample respondents were drawn randomly whose livelihood depend on agriculture, fishery and allied activities. Risk perception was studied to identify the risk with open ended questions based interview schedule. The response was collected both through focus group discussion and personal interview with key informants and community members. The list of villages and their respondents are given below in Table -2

*Table – 2 : List of Villages surveyed and their total number of respondents*

| Sl. No. | Districts     | Villages       | Population | No. of Respondents |
|---------|---------------|----------------|------------|--------------------|
|         | Balasore      | Barabatia      | 232        | 38                 |
|         | Bhadrak       | Kuruma         | 377        | 25                 |
|         | Kendrapara    | Uttarbagapatia | 85         | 17                 |
|         | Jagatsinghpur | Piparkani      | 67         | 22                 |
|         | Puri          | Keutajanga     | 219        | 42                 |
|         | Ganjam        | Patpur         | 475        | 64                 |

#### Background Characteristics of the respondents and their Livelihood

The field study on community perception of climate change has been conducted in six randomly selected villages, taking one from each of the coastal districts. Table -3 indicates the background information of the Respondents.

*Table-3: Background information of the respondents*

| Characteristics of the respondents          | Percentage   |
|---|--------------|
| <b>Age of the respondents</b>               |              |
| 15-30                                       | 14.4         |
| 31-40                                       | 22.1         |
| 41-50                                       | 35.6         |
| >50   | 27.9         |
| <b>Level of education of the respondent</b> |              |
| Illiterate                                  | 13.5         |
| Literate                                    | 50.0         |
| M.E   | 27.9         |
| Above                                       | 8.7          |
| <b>Marital status</b>                       |              |
| Unmarried                                   | 5.8          |
| Married                                     | 94.2         |
| <b>Main occupation</b>                      |              |
| Agriculture                                 | 42.4         |
| Fishery                                     | 49.0         |
| Small business                              | 4.8          |
| Casual labour                               | 3.8          |
| <b>Total No. of respondents</b>             | <b>100.0</b> |

This Table-3 contains the information regarding age of the respondents, level of education, marital status and main occupation of the respondents. According to the level of education it is found that around 14 per cent are illiterate while half of the respondents found to be literate, around 28 per cent have studied up to middle school and very less percentage of the respondents are above the middle school standard. According the occupation of the respondents it is found that in these areas people mostly depend on fishing and agriculture for their livelihood.

Land is the most crucial source of the coastal poor as they adopt agriculture and/or fishery as a source of livelihood. Table-4 indicates the land holding size, types of crops, pattern of cultivation and use of seeds by the respondents,

*Table – 4 : Size of Land Holdings and Agricultural Practices*

| Agricultural practices           | Percentage |
|----------------------------------|------------|
| <b>Ownership of land holding</b> |            |
| Own land                         | 86.4       |
| Leased land                      | 13.6       |
| <b>Amount of land holding</b>    |            |
| 0.0-0.5                          | 15.8       |
| 0.5-2.5                          | 63.2       |
| 2.5-5.0                          | 21.1       |
| <b>Types of crop</b>             |            |
| <b>Kharif</b>                    |            |
| Paddy                            | 100.0      |
| Pulses                           | --         |
| Others                           | --         |
| <b>Rabi</b>                      |            |
| Paddy                            | 3.7        |
| Pulses                           | 96.3       |

|                               |      |
|-------------------------------|------|
| Others                        | --   |
| <b>Pattern of cultivation</b> |      |
| Ox plough                     | 20.5 |
| Power tiller                  | --   |
| Tractor                       | 79.5 |
| <b>Type of seed used</b>      |      |
| Traditional                   | 34.1 |
| Improved                      | 65.9 |
| <b>Type of loan incurred</b>  |      |
| Bank                          | 35.5 |
| SHG                           | 15.8 |
| Co-operative                  | --   |
| Private lender                | --   |

The above table indicates that most of the respondents belong to small and marginal group of farmers and paddy is the most important agricultural product followed by pulses. But during the study it was revealed that Rabi crops were limited to a part of northern and central part of coastal Odisha. As per the study, the farmers have adopted more mechanization replacing the traditional farming with ox and plough. Table -5 indicates the source of fishing of the respondents.

Table -5 : Type of fishing activities

| Type of fishing        | Percentage of people adopting |
|------------------------|-------------------------------|
| Deep sea               | 50.6                          |
| Near the ocean         | --                            |
| Wetland/blackish water | 54.5                          |
| Pond                   | --                            |
| Geri                   | 15.5                          |
| <b>Total (N)</b>       |                               |

In the surveyed villages it was observed that 50 per cent of the respondents depend on fishing for their livelihood. Deep sea fishing, wet land/brackish water and Gheri are main sources for fishing activity.

#### **People's perception on the effects of Climate Change**

Although various exposures to climate changes along Odisha coast have been indicated through secondary data and other studies, people's perception is also important considering their behaviour and responsive actions. The changing scenario of climate events have been perceived and mentioned by the participants of FGDs that were carried out in the study area. Temperature as perceived by the participants in general has increased these days compared to the past. Excessive and erratic rainfall in a few successive days being experienced these days rather than constant and consistent rainfall over wide span of days in the past. Moreover, the period of rainfall has changed over the years, what the participants termed as 'untimely rainfall' that poses much difficulty in practicing their livelihoods. The shifting of rainfall has been causing severe devastation to crops and culture of fisheries. People perceive that tidal surge is inundating with unusual high tide in the time of full moon and devastate the livelihood options. According to the results of the questionnaire survey, most of them believe that a catastrophic cyclone like the super cyclone may occur in this in the near future. As for climate exposures and sensitivity, there is a consensus about the risk perception of this area. Most of the people ranked cyclones as the most prevalent climate hazard followed by floods, tidal inundation, heat waves and coastal erosion. Perception of the coastal community regarding change in climatic conditions affecting their economic activities and livelihood is given in Table - 6.

Table - 6 : Perception about changing Rainfall & Temperature



| Change in rain fall and temperature |            |
|-------------------------------------|------------|
|                                     | Percentage |
| <b>Rainfall</b>                     |            |
| Change in rainfall in past years    | 99.0       |
| Change in number of rainy days      | 99.0       |
| Change in period of rainy days      | 98.1       |
| <b>Temperature</b>                  |            |
| Temperature in summer               | 99.0       |
| Temperature in winter               | 90.4       |
| Future temperature                  | 88.5       |
| <b>Total No. of Respondents</b>     |            |

Out of 208 respondents 99 per cent have the perception that the pattern of rainfall and the number of rainy days has changed while 98 per cent of respondents said there is a change in the period of rainy days. Regarding change in temperature it is found that 99 per cent told there is a change in temperature in summer whereas, around 90 per cent viewed that the temperature in winter has also changed. 88 per cent of respondents said that the process of change in temperature is gradually manifesting an increasing trend in atmospheric heat. The perception of the respondents about the time line of change in quality and duration of rainy days and change in temperature is given in

Table -7.

*Table-7: Perception about Frequency and Intensity of Rainfall*

| Change in rainfall                    | Decreasing (per cent) | Same (%) | Increasing (%) |
|---------------------------------------|-----------------------|----------|----------------|
| <b>Change in quantity of rainfall</b> |                       |          |                |
| Last 5 years                          | 95.1                  | 1.0      | 3.9            |
| Last 10 years                         | 89.3                  | 5.8      | 4.9            |
| Last 20 years                         | 40.8                  | 12.6     | 46.6           |
| <b>Change in number of rainy days</b> |                       |          |                |
| Last 5 years                          | 76.7                  | 1.9      | 21.4           |
| Last 10 years                         | 68.0                  | 8.7      | 23.1           |
| Last 20 years                         | 23.3                  | 19.4     | 56.7           |
| <b>Change in period of rainy days</b> |                       |          |                |
| Last 5 years                          | 79.4                  | 2.9      | 17.6           |
| Last 10 years                         | 64.7                  | 21.6     | 13.7           |
| Last 20 years                         | 26.5                  | 21.6     | 48.0           |
| <b>Changes in summer temperature</b>  |                       |          |                |
| Last 5 years                          | 4.9                   | 1.9      | 93.2           |
| Last 10 years                         | 1.9                   | 10.7     | 87.4           |
| Last 20 years                         | 33.0                  | 22.3     | 44.7           |
| <b>Changes in winter temperature</b>  |                       |          |                |
| Last 5 years                          | 54.4                  | 5.8      | 39.8           |
| Last 10 years                         | 46.6                  | 11.7     | 41.7           |
| Last 20 years                         | 31.1                  | 16.5     | 52.5           |
|                                       | 9.8                   | 19.6     | 70.6           |

In this table pattern of change in rainfall and temperature during last 20 years as perceived by the respondents is presented. There is a general perception that there is a decline in the quantity of rain fall during the last five years and more decreasing continuously since last 20 years. It is not only the quantity of rainfall but also the numbers of rainy days are also decreasing continuously during last 20 years. In last five years the pattern, quantity and period of rain have decreased much in comparison to last 20 years besides increase in atmospheric temperature. This change in temperature is more visible during last ten years. Table -8 indicates the perception of the community regarding the impacts of rainfall on agriculture.

*Table-8 : Effect of change in rainfall on crop production*

| Reason for decreasing crop production | Percentage |
|---------------------------------------|------------|
| Decreasing amount of rainfall         | 38.5       |
| Rainfall coming late in seasons       | 41.3       |
| Increasing incidence of flood         | 21.2       |
| Water logging due to poor drainage    | 3.8        |
| Outbreak of diseases                  | 3.8        |
| Increased pest attack                 | 1.9        |
| Decreased soil fertility              | 3.8        |
| Repeated occurrence of cyclone/storm  | 9.6        |

Declining crop productivity in the recent times is mostly perceived by the community as because of changing pattern of rainfall. Perception of the people regarding declining crop production are related to decreasing amount of rainfall, rainfall coming late in the season and increasing incidence of floods and water logging as well as saline inundation. Water logging due to poor drainage system, outbreak of diseases in crops, increased pest attack, decrease in soil fertility due to change in local climatic conditions are perceived as the major deterrents for declining productivity in agriculture and agriculture based livelihood.

### Climate Change, Livelihood and Adaptation Strategy

*Table - 9 : Reasons for decreasing fish production*

| Reason for decreasing fish production | Percentage |
|---------------------------------------|------------|
| Irregular weather condition           | 72.1       |
| Change of fishing calendar            | 73.1       |
| Over population                       | 72.1       |

Table - 9 indicates the impact of climate change on fishing which is also a major source of livelihood of the coastal community. More than 70 percent of the respondents said that irregular weather conditions and sudden and frequent changes in climate has brought a change in the fishing calendar. As a consequence of frequent weather disturbances, there has been a decline in the number of fishing days leading to decreased fish catch.

*Table – 10 : Effect of changing rainfall on livelihood*

| Effect on livelihood                                 | Percentage |
|--|------------|
| Cause frequent flood                                 | 71.2       |
| Prolonged dry spell                                  | 41.3       |
| Damage of crops due to water logging                 | 35.6       |
| Pest attack  | 4.8        |
| High incidence of crop failure                       | 34.6       |
| Prolonged and repeated illness                       | 16.3       |
| Loss of wage   | 59.6       |
| No communication for transportation                  | 27.9       |
| Poor fish catch                                      | 71.2       |
| Non-availability of fish in shore lines              | 67.3       |
| Over flowing of ponds and loss of pisci-culture      | 46.2       |
| Shortage of marine fishing due to weather conditions | 38.5       |
| <b>Total No. of Observations</b>                     | -          |

Table -10 indicates the perception of the community regarding the impact of changing rainfall pattern on the livelihood associated with various economic activities. From the above analysis it can be observed that climate change has affected declining agricultural productivity, daily wages, declining fish catch, damage to crops due to saline inundation and pest attacks. To overcome the problems arising out of climate change, people have adapted

some alternative strategies. More than 75per cent of the people are working as labour whereas, more than 65per cent of the people reported that some people are migrating to urban areas for earning wages and some people are giving emphasis on alternative sources of income in their local areas. More than 50 percent of the people have changed the crop calendar while some of them are growing short duration crops, emphasis on live stocks and cultivation in wet lands. However, people have adapted different strategies to address the issues of changing climatic condition (Table-11).

*Table -11: Strategy adapted to meet the challenges of climate change*

| Adaption strategy                            | Percentage |
|--|------------|
| Growing crops that can survive water logging | 36.5       |
| Growing short duration crops                 | 26.9       |
| Cultivation in wet lands                     | 24.0       |
| Emphasis on alternative source of income     | 64.4       |
| Emphasis of live stocks                      | 22.1       |
| Rain water harassing                         | 70.2       |
| Working as labour                            | 76.0       |
| Migrating to urban areas for wages           | 67.3       |
| Changing crop calendar                       | 53.8       |
| <b>Total No. of Observations(N)</b>          | -          |

Respondent in general perceived that their livelihood assets are affected directly or indirectly by climate change, erratic rain fall (late arrival, early withdrawal, uneven distribution etc.), increase in storms, saline inundations due to storm surges, water logging and pest attacks. . The general perception of the people is that due to climate change the cost of agriculture has increased.

Fishing is one of the most ancient and traditional livelihood sector for the coastal communities. Traditional fishing in the river mouth, estuarine areas and offshore regions of the coast are badly affected due to changing climate and changing morphology of the coastal wet land areas. The change in the surface temperature conditions, migration of fish to dipper seas, more people involved in fishing and mechanised commercial fishing along the coast has affected the livelihood of the fisherman community involved in marine fishing. Because of over exploitation by commercial fishers, poor fisher people and their livelihood has been affected. The small scale traditional fishing community find it difficult to earn livelihood as the families dependent on a single source of income. In addition to agriculture and fishery the popular livelihood option along the coast line is betel leaf farming which is highly sensitive to temperature. The farmers realized that rising temperature, long dry month followed by heavy rain and storm winds adversely affect betel vine which is a .a popular livelihood among the coastal communities of Odisha. Few years back beetle vine was quiet profitable but this has been adversely affected by siltation of creeks, change of habitat and decreased water flow. Thus livelihood options have been dwindling over the years causing migration from farm to nonfarm sectors of economy as well as rural urban migrations.

The study of perception reveals that the change in rain fall and temperature pattern, has been accepted by the coastal communities as the reality of time.. However, the coastal community has been addressing climate variability and extremes through indigenous adaptation practices since long. The adaptation practices vary far and wide and are very often local specific. This being an emerging area the adaptation practices are required to be documented .and some of them can be replicated with strategic modification. Replicable practical models need to be worked out taking community experience into consideration as well as exploring possible expansion of livelihood option, alternative ways to enhance productivity and agricultural inputs. Important environmental issues pertaining to livelihoods due to climate change in different coastal stretches along Odisha coast are given in the table below (Table – 12).

*Table -12: Summary of Important Environmental Issues pertaining to Livelihoods due to Climate change*

| District | Important Livelihoods | Important environmental issues pertaining to livelihoods | Other major environmental issues |
|----------|-----------------------|--|----------------------------------|
|          |                       |  |                                  |

|                      |  |  |   |
|----------------------|--|--|---|
| <i>Puri</i>          | Fish and Fisheries<br>Tourism<br>Cottage industry<br>Agriculture<br>Horticulture (Cocunut, Betel vine etc.)                    | Fishing in Chilika area and coast<br>Prawn gharries<br>Fish & Prawn processing<br>Effluents and sewage waste discharged to sea<br>Salinity in groundwater<br>Presence of cultural heritage sites | Integrated Coastal zone management restrictions   |
| <i>Jagatsinghpur</i> | Fish and Fisheries<br>Agriculture<br>Horticulture(Betelvine etc.)<br>Industry  | Fishing on coast<br>Prawn gharries<br>Fish & Prawn processing<br>Salinity in groundwater   | Industrial pollution at Paradeep,   |
| <i>Kendrapara</i>    | Fish and Fisheries<br>Agriculture<br>Mangrove based livelihood<br>Horticulture (Cocunut, Betel leaf etc.)                      | Fishing on coast and Bhitarkanika Coast<br>Extraction of forest produce from Bhitarkanika Mangrove area<br>Prawn gharries<br>Salinity in groundwater   | Bhitarkanika Mangrove reserve and related restrictions and ban imposed for Olive Ridley |
| <i>Bhadrak</i>       | Fish and Fisheries<br>Industrial mining<br>Mangrove based livelihood<br>Agriculture<br>Horticulture (Cocunut, Betel leaf etc.) | Fishing in coast<br>Prawn gharries<br>Fish & Prawn processing<br>Intrusion in habitat of salt water crocodiles<br>Salinity in groundwater  | Industrial pollution at Dhamara Port  |
| <i>Balasore</i>      | Fish and Fisheries<br>Tourism<br>Industrial<br>Horticulture (Cocunut, Betel leaf etc.)<br>Agriculture                          | Fishing in coast<br>Prawn gharries<br>Fish & Prawn processing<br>Salinity in groundwater<br>Missile Test range at Chandipur  | Industry pollution source at Balasore Town,   |
| <i>Ganjam</i>        | Fish and Fisheries<br>Salt farming<br>Tourism<br>Cottage industry<br>Agriculture<br>Horticulture (Cashew, Betel vine etc.)     | Fishing in Chilika area and coast<br>Prawn gharries<br>Fish & Prawn processing<br>Effluents and sewage waste discharged to sea<br>Salinity in groundwater  | Industrial pollution from Gopalpur Port and Industries                                  |

Source: Project Report TRIPTI, Deptt. of P.R., Govt. of Odisha

### Findings and Discussion

The perception of the community members is that the amount of rainfall available for agriculture has declined to an extent that the farmers have now to depend almost entirely on the irrigation canals and groundwater sources. For the farmers in the interior areas, who have depended on rainfall as their chief source of irrigation, the consequences are serious enough to require them to stop operations altogether. The increased incidence of sudden and intense downpours has become a concern for the coastal dwellers. A long spell of slow rain to keep the fields constantly watered – has become rare.

Most respondents recalled that the summer peak temperatures never crossed 45°C in the past before 2000 but are now routinely touching 45 degree or even more. Heat waves and prolonged dry spells have become the normal, and even more alarming is the fact that high temperatures extend over a much longer duration than previously. This implies that the duration as well as the intensity of winter has declined. Although the effects of

increasing temperature on biodiversity are not clear, these are reflected most directly in livestock, agriculture, horticulture and other related sectors. The implications of raised temperatures are felt on the livelihoods of the daily workers: with reduced ability to work during the day, Increased power consumption has lead to extended power cuts that in turn lead to reduced working hours. For agriculture and horticulture sectors: increased demand for water and electricity has reduced profitability and has brought a host of other health complications, financial burden on the community. While the effects of temperature rise in the sea are not directly perceived by the fishers interviewed during the study, there are perceptions that there is a change in fish species composition and behaviour in a particular area. There are also observations that many fish species have either moved away from their usual haunts along the coast and that some new species have appeared where they had rarely been seen before.

Coastal erosion happens primarily as a result of sea level rise, intense storm action, and changed or more intensive wave action. In the coastal areas intense storms and increased wave action have certainly accelerated the rate of erosion in several coastal This has lead to loss of long stretches of coastline and damage to properties, salinised freshwater sources and loss of mangroves. While tracking for climate change induced livelihood patterns, it has been observed that the stresses on the livelihoods of the communities are also due to enormous growth in population size in the coastal districts. Increased population in this zone has resulted in further demands on the natural resources, more pressure on the living conditions, social safety nets and access to alternative avenues, severe competition & conflicts over resources, degradation of common property resources and out migration from the area. The most important change impacting the livelihoods of the coastal communities are declining productivity, quality, quantity, variety and distribution of the resources. There have been significant changes in the forest/farm products as well as fishery products, which resulted in the loss or depletion of several key varieties.

#### **Coping strategies among the community members and the way forward**

The adaptive and coping strategies in the community revolves around livelihood enhancement strategies, which involve improving the performance of the existing livelihoods and livelihood diversification strategies, focusing on shifting to other activities and or other geographical areas. Next, concepts like 'climate change' and community resilience remain very broad and not easily understandable at the local levels. There is a need to translate these knowledge in to a decision making process at the local level relating to their environment'. Awareness should be generated that climate change is happening and virtually everyone – farmers, foresters, or fishers; rich or poor; owner or worker; coastal or upland dweller; men or women are being affected, developing appropriate mechanisms to help them undertake reforms in their own environment is the key for achieving the resilience. The study leads to the conclusion that there are no simple solutions to this problem. It is also important to raise their capacity to undertake changes in their own practices overcoming their existing vulnerabilities. Based on the above considerations, the climate vulnerability of the coastal communities and enhancing their resilience should focus on awareness raising in the communities and among the support institutions and mechanisms to support and streamline sustainable livelihood enhancement and diversification.

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## 17. INTERNATIONAL RELATIONA STUDIES AND DEFENCE STRATEGIC STUDIES

### 0317026 CHOEDON, YESHI (Centre for International Politics, Organization and Disarmament, School of International Politics, Jawaharlal Nehru University, New Delhi). POPULISM AND GLOBALIZATION: IMPACT ON INTERNATIONAL RELATIONS

The rise of populism in the post-Cold War is due to the negative impact of globalization. It has become a prominent concept in the understanding of international relations. The paper starts with the clarification of the concept. Then it differentiates the recent usage of the term from that of the related concepts such as social movement and new left movement. Then the paper hights how the populism of the post-Cold War could be broadly categorized into two. They have been labelled differently by different authors such as left, progressive liberal populism as one category and the other category as right, reactionary, conservative populism. This paper uses two categories as left-wing populism and right-wing populism. The paper elaborate on how both categories of populism are ‘thin-centred ideology’ and how they attached and combined with other thick ideologies such as communism, socialism, nationalism, and conservatism.

The first part of the paper discusses the contextual circumstances which give rise left-wing populism of the 1990s and what is their main grievances against the globalisation and demand on international relations and elites of states. The paper discusses the characteristics of mobilization and expression of grievances against the elites as well as globalization. How left-wing populism is favour for more inclusive multilateralism with effective voice for all the member states, reflecting the general will of the people.

The second part of the paper discusses why and how right-wing populism gained prominence in the turn of the century and how they have manifest in various countries of the Global North. The paper goes on to discuss their grievances against the globalisation as well as the elites of the countries and how they demand their leaders to follow in-ward looking policy. How and why the right-wing populism favour tradition, reaction and nationalism, protectionism. The paper highlights how their influence over the behaviour of their states impacts international relations.

The paper ends with a discussion of similarities of the categories of the populism in terms of their anti-globalization and wanting the states to take back the control and thus enhancing the role of state but altogether for different reasons. It discusses how these two categories of populism have a different impact on international relations in general and multilateralism in particular.

## 18. JURIDICAL SCIENCE

**0318027 SUDESH, V (Bangalore University, Jnana Bharathi Campus, Mysore Road, Mutharayana Nagar, Bengaluru – 560056).**

Dear Professor/teachers/researchers/social scientists,

The 43rd ISSA brings upon a great opportunity for all social scientists to interact and upon reflect the trends and developments in the area of juridical science. The objective of the ISSA is to reflect upon the current science of nature-human society in India. In this regard, the year that has gone by has witnessed some significant changes in the area of law-making and law interpretation through the medium of the courts.

Various proclaimed rights enshrined under the Constitution such as, the right to privacy, right to equality, the dignity of human beings, etc., have received the much-needed push and emphasis from the lawmakers and the judiciary. The progressive interpretation of the right to life by the apex court found its resonance in a judgment delivered to protect the right of privacy of an individual from interference by the State. The emphasis of the court was to protect human dignity as enshrined not only in the Constitution but also in the United Nations documents. This trend of interpretation by the Supreme Court has encouraged many scholars and intellectuals not only to appreciate the verdict but also to discuss and broaden the right of privacy.

Gender inequality has been the bane of Indian society right from the medieval times. Notwithstanding the constitutional mandate to secure and protect gender equality, we find several practices across religions in India which has triggered mass movements by gender champions to secure their rights on par with men counterpart. The Supreme Court of India got an opportunity to set-right the gender discrimination in so far as worshipping or rather permitting the entry of women to the premises of the diety in the *Sabarimala* verdict. But this milestone judgment was again in issue before the judiciary and is referred to a larger bench of the apex court. The larger question of interference in matters of religion by the courts or interpretation of religious faith vis-a-vis constitutional rights, has generated a lot of research among constitutional experts. Along side the *Sabrimala* verdict, the declaration of the practice of triple talaq as unconstitutional by the apex court brought in jubilation to muslim women and the enactment of specific legislation in line with the verdict of the Supreme Court laid to rest the debate on supremacy of constitutional right over discriminatory religious practices.

With the dismissal of all review petitions filed against the *Ayodhya* verdict, the Supreme Court has firmly re-established that under the Constitution of India, it is the final arbiter of justice. A dispute which was lingering for more than a century over a place of workshop was finally settled to do complete justice not only to the disputant parties but also crores of faithful worshippers.

Host of decisions of the Supreme Court and the trend of lawmaking is reflection on the nature of law contemplated by the sociological school of jurisprudence. The apex court has tried to reconcile and balance the competing social and individual interest. Perhaps the judgement of the Supreme court while decriminalising homosexuality in the following word, "*LGBT community has the same rights as that of any ordinary citizen. Respect for each other's rights and other are supreme humanity. Criminalising gay sex is irrational and indefensible,*" is an indication of the progressive interpretation of the law in a manner that ordinary citizen of this country realises the importance and impact of rule of law.

The coming century will pose great challenges to the legal regime across the globe. With use of science and technology in day to day to governance by the government and citizens alike, our society has become data driven. Legislative process in the future will be data driven, for example, data available on the social websites or the internet could be used for policy direction. Similarly, judicial decision making process will be automated with less human interference. The challenges that a data driven society would pose will relate the fairness and ethical use of public data. Artificial intelligence and robotic assistance will throw up legal challenges of negligence and liability.

Increasing awareness of individual rights and balancing rights of development, protection of environment, supremacy of the government calls for respect for rule of law by all stake holders.



The voluminous regulatory laws and the jurisprudence of case laws definitely presents an opportunity for socio-legal researchers to contribute to the development of juridical science. Law and social transformation is the essence of juridical science.

I wish the deliberations on the various thematic panels leads us to offers simple solutions to socio-legal issues.

## 21. MATHEMATICAL AND STATISTICAL

### 0321028 PANDA, TARINI CHARAN (Ravenshaw University, Cuttack). MATHEMATICAL DIGITAL TECHNOLOGIES IN PROBLEMS OF NUMERICAL WEATHER PREDICTION

Digital technologies refer to a wide range of devices which combine the traditional elements of hardware (processing, memory, input, display, communication, peripherals) and software (operating system and application programs) to perform a wide range of educational applications.

Pascal's and Leibnitz's mechanical calculating machines, Napier's logarithms, Babbage's difference engine are just a few examples of computational tools which have been fundamental to the evaluation of digital technologies to support mathematical developments.

There is a need to recognize that mathematical digital technologies to exploit the benefits of teaching, learning and doing mathematics when it becomes unthinkable to solve a complex mathematical problem without ready access to digital technological tools. In addition there is a need to solve mathematical modeling, problem solving and computer programming making use of powerful mathematical digital technologies that are widely used in society and workplace.

Usages of digital technology within school & college mathematics have been predominantly teacher-led and mainly focused on presentational software such as power-point and interactive whiteboard software. Rot learning of the current mathematics curriculum will not be sufficient to produce the problem solvers, independent thinkers and the designers the country needs. This specification of the knowledge and skills require to use digital technologies to access real-world data in modeling problems of weather prediction numerically, the most complicated inter disciplinary and multi dimensional subject areas on which the economy of the country depends.

One of the challenges facing humanity nowadays is the need of a self-conscious management of the plant Earth which in turn demands an improve understanding of the interdependence between human development and environmental change. The increase in concentration of greenhouse gases and the impact on the temperature, ozone depletion, land and forest degradation etc are some of the threats to the mankind.

Earth and the environmental sciences are the greatest intellectual interest and of the most extensive practical importance. Some of the most important open problems of physics can solved by applying advanced mathematical methods, computational techniques and statistical tools. Atmosphere and Oceans are inherently non-linear phenomenon with an unstable and chaotic behavior. Also fundamental scientific issues, in addition have important practical consequences in the prediction of weather and climate, drought and floods, earthquakes and volcanic eruptions, storms and associate surges. Scientific and sound knowledge from the documented literature with coordinate and consulted efforts to face the hostile conditions in many areas of the third world are needed for implementation of developmental issues.

Earth & Environmental Sciences are international and inter-disciplinary by nature. However such cross-disciplinary problems require observational data from many parts of the earth, which can be obtained through international cooperation programs, while consequences of many studies have implications in distant places.

Weather forecasting is not a new science; it has long history because of the importance of weather in human activity. The weather affects our lives in multidimensional ways through agriculture, industry, transportation, communication etc. In addition inventions and scientific innovations marked the important advances in weather prediction.

The invention of barometer in 1643 by Torricelli is considered to be the beginning of meteorology as a science. Because of the close relationship between atmospheric pressure local weather the barometer became a useful tool. Surprisingly, the first synoptic map of surface pressure was not constructed until 1820, however, this problem was overcome by the invention of telegraph in 1845. During the period 1850-1920 called the empirical era

weather organizations were established in many countries to provide forecast for the general public, agriculture, flood warnings, transportations etc.

V. Bjerknes (1904) was the first to point out that the future state of atmosphere can in principle be obtained by an integration of differential equations which given the behavior of the atmosphere, using an initial field variables describing an observed state of the atmosphere. Such an integration performed using numerical methods is called Numerical Weather Predictions (NWP). However, when a numerical integration is performed starting from fictitious initial field variables it is called Numerical Simulation (NS). A first practical attempt at a numerical weather prediction was made L.F. Richardson. After a very tedious and time consuming computation carried out mostly during the 1<sup>st</sup> World War, Richardson obtained a totally unacceptable and erroneous result. Despite this, he described his method s and results in book (Richardson, 1922) and this is today one of the most important documented literature. The erroneous result obtained by Richardson and his estimate that 64000 men are necessary to advance the calculations, left some doubt as to whether the method would be of practical use. A number of developments that followed however improved the situation.

Meteorology was one of the very first of fields of physical science that had the opportunity to exploit high speed computers for the solution of multi dimensional, time dependent, long linear problems from Bjerknes to Von Neumann. The working principle of numerical methods rapidly expanded as the physical problems grew in complexity and as practical experience accrued. As a consequence these advances often lacked the vigor and proof that might have been expected from applied mathematicians.

The rapid influx of new scientists into numerical modeling, induction of much faster computers and improved understanding of computational problems enable long term integrations of the basic primitive equations (divergence and vorticity). A number of research groups have been actively engage for a little over six decades and development of models for numerical simulations of the general circulation of the atmosphere. Numerical models are very frequently developed for studies of simulation processes within the Planetary Boundary Layer (PBL).

Many numerical models have been developed for a wide range of applications with different degrees of sophistication. The formation of a model depends on its motivation and demand. Nevertheless, modeling has three aspects.

- To look for a mathematical formula apparently fitting to a real situation
- To introduce into this formula adequate experimental data
- To compute the results

To bridge the wide gap between theory and practice some drastic assumptions and simplifications to make the mathematical competitions tractable are unavoidable. There have been a lot of confusions in the minds about an approximation and a model. Conceptually approximation retains full information contained in the original equations so that an approximate solution is expected to approach the exact solution when improved upon. On the contrary, modeling is meant a similitude and as such the exact solutions could never be approached by modeling. Modeling has the following utilities

- Accuracy (to make reliable predictions)
- Economy (to minimize the cost of completion)
- Universality(to secure a wide range of applicability)

The deterministic methods of weather forecasting fall into the broad categories namely Numerical Weather Prediction (NWP) and Statistical Methods. The NWP models can only produce forecast of large scale flow of atmospheric fields and do not produce forecast of the weather elements realize at the surface such as visibility, thunder storms, etc., for a specific location. On the other hand, dynamical-statistical models can produce the deterministic forecast of weather elements for a specific location and time. The classical models have also been successfully used in the long range forecasting of monsoon rainfall over India. When the output from an NWP model is used in the formulations, the method is known as Model Output Statistics (MOS) which are useful for medium range weather forecast.

The development of dynamical-statistical models begins with a historical data set. The reliance of historical data is advantageous because it ensures that the forecasts are firmly rooted in reality as represented by the weather observations. In addition, the influence of local topography and other circulation are inbuilt in the historical data.

Dynamical-statistical models for forecasting purposes and human activity, such as agriculture, power management, surface transportation, communication, water management, etc. are developed. For aviation purpose the lead time of forecast required vary from 1 to 2 hours (very short range) to 24 hours (short range) in advanced and hence the development of dynamical-statistical models using historical data is advantageous.

The dynamical-statistical models requires

- i. Selection of an ideal location for the development of the models
- ii. Availability of long (5 years and more) and continuous good quality data at the selected location and surrounding air fields.
- iii. Data processing, error analysis and filling up of missing data.
- iv. Selection of suitable predictions.
- v. Selection of suitable statistical methods and formulation of the problems.
- vi. Verification and validation of developed forecast models.

Northwest India having many airfield require objectives weather forecasts for better planning and operations. The importance of the weather element required to forecast depends upon the season and location of a station. For example, minimum temperature and hence cold wave conditioning and visibility in winter are important weather elements that effect aviation. Thunderstorms and the gusty/squally winds associate with the thunderstorms are important during the pre-monsoon months. Delhi being a heavy air-traffic region an experiences extreme weather conditions during summer, winter as well as monsoon months making it the ideal location of development of the models for Northwest India. Further, long and continuous historical data is available for the development of the models.

The important weather elements that effect the aviation activity in the different seasons over Northwest India are:

- Minimum/maximum temperature during winter/summer respectively.
- Visibility during winter.
- Thunderstorms/squall or gust speed / surface wind during pre-monsoon.
- Stratus clouds / precipitation during southwest monsoon.

Dynamical;-statistical model studies for deterministic prediction of the above mentioned weather phenomena at a specific location in a specific time frame are rarely found in any documented literature. Therefore to develop comprehensive models for quantitatively forecasting using statistical methods are validate with the recent year data set for operational purposes. Nevertheless many social and psychological sectors of economy are significantly affected by weather conditions.

A weather forecasting program usually involves four distinct variables x, y, z and t which can be classified as area (x, y), space (z) and time (t). Time and space orders of magnitude for different scales of weather phenomena are:

- Micro scale (few seconds and few meters)
- Meso scale (few hours and few kilometers)
- Synoptic (few days and few thousand kilometers)

Based on the time range of forecasts, these are classified into Now cast (few minutes to 2 hours), Very Short Range Forecasts (few hours to a day), Short Range Forecasts (1-2 days), Medium Range Forecasts (3 – 7 days) and Long Range Forecasts (few weeks to few months).

Statistical methods play an important play an important role in all activities where large volume of data handling is needed. Thus statistical method finds application in agriculture, biology, political science, business,

communication, sociology and other fields of sciences and engineering. Statistics in meteorology is concerned with scientific methods of collecting, organizing, summarizing data and drawing conclusions and making reasonable decisions on the basis of such data analysis. The problem of weather forecasting which is one of the complex scientific problems can be solved in a deterministic manner to a large extent by the use of statistical techniques. Application of statistical methods descriptive and inferential provides a link between the past observation (historical data) and future state of weather elements.

## 24. PHYSICS

### 0324029 SEN, ASOKE KUMAR (Assam University, Silchar 788011). TEACHING AND RESEARCH IN INDIA: HOW DO THEY CONTRIBUTE TO 'INDIAN SCIENCE' ?

According to some recent report (Forbe's May 2017), India is considered as a member of the elite space club comprising six countries in the world which have the latest space technologies. Each of them builds its own orbital-class rockets, satellites and scientific payloads, and further has either achieved human spaceflight or interplanetary robotic science missions or both. These six countries/ agencies in alphabetic order are : China (CNSA), European Space Agency (ESA), India (ISRO), Japan (JAXA), Russia (Roscosmos) and USA (NASA). This can be considered to be a proud achievement for a country like India, which ranks seventh in terms of nominal GDP (\$ 2.72 trillion) after USA, China, Japan, Germany, UK, and France (estimate for 2018, as reported by IMF website). But, due to its huge population of more than 1.37 billion, India is at 145th position in terms of GDP (nominal) per capita. And the per capita income of India is approximately 5 times lower than the world's average around \$11,673. This figure is over 50 times lower than the richest country in the world and approximately 10 times greater than the poorest country in the world. India is at the 33rd position in the list of Asian countries.

But the space programme is important, as it makes us technologically advanced and further decides the course of human evolution and locates our position in the Universe for future.

ISRO is known for shocking the rest of the world with brilliant accomplishments on a modest budget by sending a probe (of their own design and manufacture) to Mars on their own rocket and on their very first attempt.

So credit goes to our Indian scientists for maintaining such a high rank among other countries in terms of our space technologies. In terms of Nuclear missile technology, we are probably the eighth advanced country after Russia, USA, China, Britain, France, North Korea, Israel as per the New York Times report on Feb 07, 2018, by Pecanha and Collins. When it comes to the production of clean nuclear energy from plasma-based fusion reactors, India is one of the leading countries in the world.

Again when talking about the basic scientific research that India carries out, we receive a lot of appreciation from within the country and outside. It is a general feeling that the scientific research carried out by certain institutes in India are of international standards. But when we talk about such activities for Indian universities, we are very critical about it.

This issue was discussed in many platforms and forums. We could not come out with a very clear solution to this problem. According to some experts, the gap could be explained due to the fact that, since the time of British India universities were organized as examination centers, without any research component.

Desiraju from Hyderabad University (in Economic and Political Weekly June 14, 2008) observed that, after this mistake was realized, we sidestepped the issue by creating new institutes like IITs, ISERs and also setting up an organization like CSIR, ICMR etc. The author further expressed the view that, instead of setting up such institutes, we could have strengthened our universities for research activities. The institutes which do major research in India, they also receive major funding, but then they do research independent of universities. Often these institutes get cut off from society and also do not address our industrial or national needs. Finally, they become islands of the 'center of excellence'. Another problem which we faced over the past few decades is that a basic science degree does not earn a job, so our society got infatuated with engineering degrees. Many engineering institutes were created. The bright students stopped coming to basic science. But now after a few decades, we see that even the engineering degrees from reputed institutes are earning jobs neither in domestic nor in international markets. So we lost both ends.

In 2018 the National Academy of Sciences, (Prayagraj) the oldest and the largest Academy of Sciences in our country took initiative under the Chairmanship of then-President Prof. Anil Kakodkar to address such problems

and a study group consisting of eminent scientists of our country submitted a report on 'Indian Science, its competitive Strength and its relevance to National needs'.

In the preamble of the report it is stated that “In the 70 years, since independence, Indian science has had a significant impact, so much so that India now ranks 5<sup>th</sup> in global research publication output.”. The report also acknowledged the high-quality scientific research work, which is being carried out in some research institutes/laboratories in India. Different government agencies were thanked for generously funding such institutes. Concern was expressed for the lack of funding by the private or industrial sector. The question was raised: how competitive is Indian Science in the context of National Development? A particular research programme is done for whom? And for which applications? The S&T institutes should avoid duplicating research done in advanced countries and if it must be done, it should go beyond the level achieved by advanced countries, so that India creates the IPR in the competitive areas.

Concern was also expressed why quality research was not done in universities? The importance of research in basic science was emphasized. In their deliberation, among the various suggestions, the following are worth to be noted 1) Nurture excellence in research (2) translate basic research into new technology product and (3) enhance Industry-academia interaction.

The committee also made interesting observations. The countries which have a strong base in Science and Technology, are the ones which developed faster. Countries like S Korea and China had increased their expenditure in science steadily over the last few decades, where has in India it remained almost the same. The report further added: India and China had a similar population but the number of scientifically trained people in China is fifth times that in India. For every 10,000 population, the USA has 18, China has 20 and India has 4 scientifically trained persons. China was poorer than India some 30 years back, but now the situation has just reversed.

In the same context, Desiraju (2008) had commented that "in 1980 India was far ahead of China in volume and breadth of published research work. Then for the last two decades, India's research publication stagnated and for China, it increased many folds. Today China outperforms India both in quantity and quality, as measured by the impact factor of research output."

This could be also due to the fact that unlike India, a large proportion of research in China is funded by industrial sectors. Private incentives for knowledge creation are lower under developing country conditions with small markets for technology-led products, poor capital markets backing innovation investments and limited infrastructural resources. These are the views made by Dhar and Saha in 2014, ( Discussion paper #189, Research and Information System for developing countries, New Delhi, www.ris.org.in). To these, they further added, in developed countries the contribution of technology went much beyond the contribution of physical factors like labour and capital, in propelling growth in these countries.

From the above studies by various groups and committees, it seems India needs to establish a better correlation between academic research and industrial growth. But the question is what are the modalities? Promoting innovation may be one gross way of doing it, but there are many other parameters involved in this scenario. We must direct our research in those areas, where there is scope for commercialisation. Identifying those areas needs another level of research, which Japan did very successfully some decades back. Also, the market forces should take interest in showcasing our technological products at an international level. The brand name has to be earned. For industrial growth, the R&D sector has to be strengthened. The important fact is that the manpower working in the industrial R&D sector is basically trained by our university system, not by any institute or research laboratory.

The present poor industrial growth in India may be due to a lack of proper university and industry interface and subsequent interaction.

A recent article in Hindu Business Line ( Jan 30, 2018 , by Srinivas and Jayan) pointed out that, according to the SCI citation database, India's share in the global publication is only between 4 to 5%, in various fields in science. However, our SCOPUS based publication record has grown to about 8 % per year over the last ten years, whereas the global growth rate is only around 4 %. We are at present at the 7<sup>th</sup> position in terms of scientific publication output. So we are not bad in doing scientific research, but the question remains, is this research fuelling our industrial and economic growth?

It can be easily checked that the volume of publication mentioned just in the above is mostly made by selected research institutes. We spend about 0.7 % of our GDP on R&D and per publication, we spend much less money compared to other countries. This is definitely commendable, but what is not clear is their contribution to national growth.

The number of PhDs produced in India are only about a fifth of that produced by China and one-fourth of that in the USA.

So is our University system capable of providing manpower in the Industrial R&D sector, which in turn fosters the growth of the country? And if the answer is negative, then a simple answer would be, let us strengthen research in our universities.

At the same time, our industry sector will be happy if they can purchase our research findings from within the country, rather than buying it at a much higher price from outside.

Apart from several prestigious space missions and missile launches, we are also involved in several multinational mega projects like TMT, LIGO, SKA, ADITYA? We need trained manpower from universities in such projects. If we do not train and engage our graduates from the universities, then for whom these megaprojects are?

While we think about strengthening research in universities, the following suggestions may be also considered apart from getting funds from governments. With teaching burden, the teachers in colleges and universities find it difficult to do research, which is nowadays demanded. There should be more permanent recruitments in the universities, so that teaching work can be shared and more time can be given to research too. The curriculum should be more inter-disciplinary in nature in the universities. We also need to set up programmes of instrument building in the colleges level itself.

We need to maintain a balance between scholarly research being undertaken and the generation of jobs through science education. It is not necessary that in the classroom a professor should motivate all the students for high-quality research. Because as a professor, one may like to see all the bright students working with him/her for their PhDs. But what the students want at the end of their education, may be altogether different. Most of them probably want a decent job, near their home town.

There are a lot of regional disparities in the distribution of our universities/ institutes and potential employers. Our science policy should also take note of these points.

Then there are other issues, which also draw our attention. We are successful in rocket science, but can the ordinary science help in fulfilling some of our basic needs. We also need to maintain a balance between these two levels. Can our science help us in ensuring equal access to primary health facilities, clean water, and sanitation services to all our citizens? Only 90 of urban Indian and 39 % of rural Indians enjoys such basic facilities. (refer UNO report <https://in.one.un.org/health-water-and-sanitation>). Such disparities also exist among the different regions of the country.

Our country has a lot of colorful cultural diversities which we enjoy, but having disparities in the development index is something we never enjoy. The mindset of urban and rural Indians and also for Indians from different regions differ greatly when it comes to accepting the modern technologies and benefits of Science. It is apparent, India is large and no other country in the world has such large diversities.



Many of us in India, feel that good scientific research is carried only in some selected institutes distributed in certain specific parts of the country? Why people in other areas feel research is very foreign to them? The concept of scientific research is not there in certain parts of the country and some sections of society. Science has probably not entered our everyday life, as it has in other developed countries.

In a developing and multicultural country like in India, we expect a lot more from *good science*. As a part of the contribution of science in society, it should work to remove regional disparities in our development. Good science can also help us in understanding and respecting each other from different parts of the country. Science can help us in building better scientific temperaments to deal with several social issues, including eradicating superstitions and myths. It should also help us in experiencing better values for life.

It seems 'Indian Science' has some responsibilities in all such issues. In other words, in India 'Science' can be used as a common platform to meet and discuss, where disparities, whether it is in terms of social strata or regional or cultural are not given priority.

## PART IV

## THEMATIC PANEL' CHAIRPERSONS' ADDRESS

## 03. ECOLOGICAL AND ENVIRONMENTAL PROTECTION MOVEMENTS

## 0409030 MUTHANNA, COL CP (Founder and Secretary, Environment and Health Foundation). THE HIMEK ALLIANCE AN INITIATIVE TO SAVE THE WATER FOUNTAIN OF ASIA FROM CLIMATE CHANGE IMPACTS

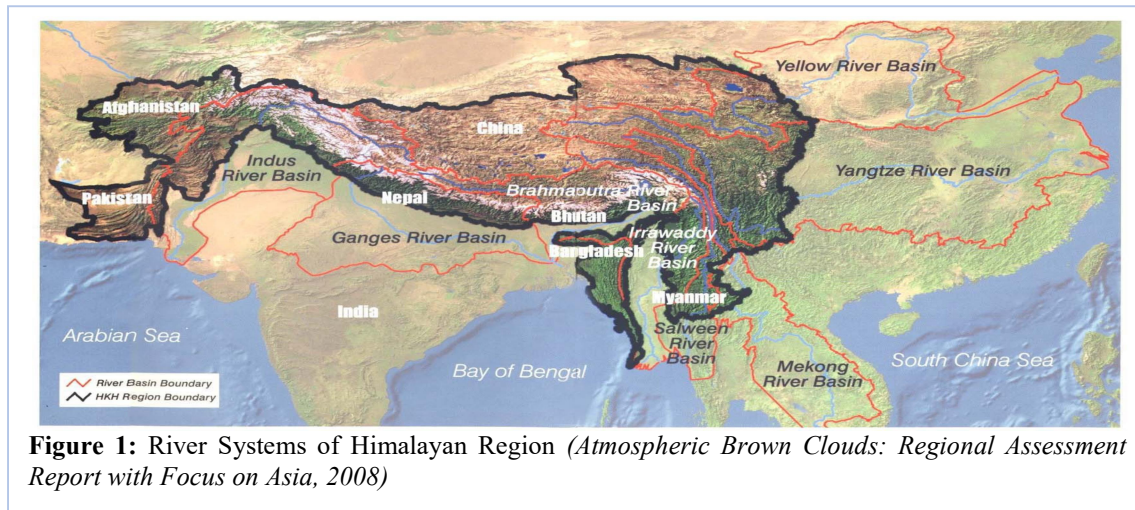
“The HIMEK is an effort to establish an alliance between the countries of the Himalayas and the countries of the Mekong region for a regional cooperation framework for promoting climate change mitigation and adaptation efforts with special focus on emission reduction of black carbon particles and forest landscape restoration”.

## 1. BACKGROUND

## 1.1 Himalayas – The Third Pole

The Himalayan ecosystem, which covers a large mountainous region of South Asia and Southeast Asia, with an area of 595,000 sq. km, extended in eight countries from Afghanistan in the west to Myanmar in the east. It is called “the third pole” as there are about 52,000 glaciers in the Himalayan region, covering an area of snow cover of 87,340 sq. km. It is the source of ten large Asian river systems, namely, the Amu Darya, the Indus, the Ganges, the Brahmaputra, the Irrawaddy, the Salween, the Mekong, the Yangtze, the Yellow River, and the Tarim (Figure 1). The Himalaya is a source of water resources, ecosystem services, and the basis for livelihoods to a population of around 250 million people living in the region. The basins of these river systems provide water for drinking, irrigation, energy, industry, and sanitation need to over 2.0 billion people living in Afghanistan, Pakistan, India, Nepal, Bhutan, China, Bangladesh, and many countries of Southeast Asia. It possesses a huge socio-economic and cultural significance to the entire region and the various ethnic communities. It consists of rich natural resources and a place of four global biodiversity hot-spots and receiving high priority for biodiversity conservation in the global agenda.

The Hindu Kush of the Himalayas is home to the rich variety of gene pools and species which carry global



importance of delegate ecosystems. With varied landscapes, soil formation, variety of vegetation, and climatic conditions, it is well-known for unique flora and fauna.

### The Mekong Region

The Mekong Region is a natural area bound together by the Mekong River basin, covering an area of about 2.6 million square kilometers. The region includes six countries, namely, Cambodia, China, Lao PDR, Myanmar, Thailand, and Viet Nam with a combined population of around 326 million (Figure 2). The region is bestowed with natural and cultural diversities. It is considered one of the world's most significant [biodiversity hotspots](#).

The region is a habitat of about 20,000 plant species, 1,300 fish species, 1,200 bird species, 800 reptile and amphibian species, and 430 mammalian species.

The region is an important food provider. The livelihood of the people living in the Mekong region directly depends on the water resources of the Mekong river basin. The region is already experiencing impacts of climate change, linked with climate change impacts on the Himalayas region, such as increasing frequency of severe storms, warmer temperature, and change in precipitation patterns, depleting ecosystems and natural resources, etc.

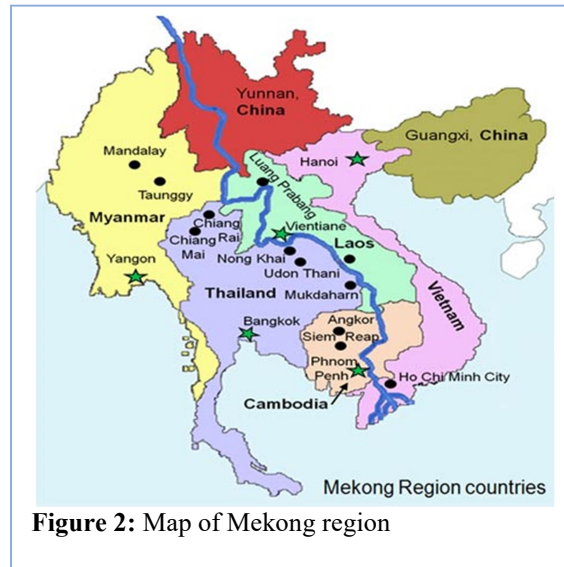


Figure 2: Map of Mekong region

## 2. THE ISSUE

### 2.1 Shrinking of Himalayas

The Himalayas - the third pole or the water fountain of Asia is shrinking. The glaciers of the Himalayas are melting rapidly due to increasing Earth's surface temperature induced by climate change and other factors. The rate of warming increases in the Himalayan region with altitude which makes the Himalayas more sensitive and vulnerable to climate change. Climate change projections suggest that the Himalayas and its river basins are likely to warm by at least 1 °C by end of this century, while in some areas the warming could be as much as 3.5 to 4 °C.

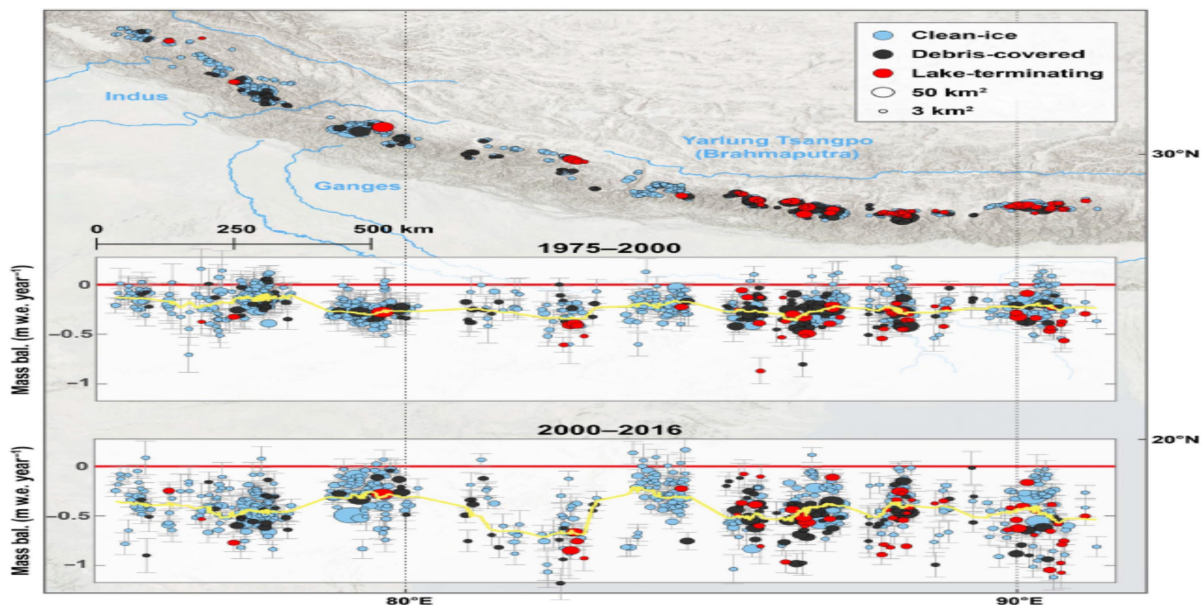


Figure 3: Melting of Himalayan glaciers from 1975 to 2016 (Maurer et al. (2019), Acceleration of ice loss across the Himalayas over the past 40 years, *Sci. Adv.* 2019; 5: eaav7266)

The rate of warming in the Himalayan region is considerably higher than the global average. Therefore, the rate of melting of the Himalayan glaciers is faster and during recent decades, the melting of glaciers is much faster. Numerous scientific evidence support this claim. A recent study by *Maurer et al. (2019)* revealed that the entire 2000 km transect of the Himalayas has shown strong evidence of the melting of glaciers. As per the study, from 1975 to 2000, the rate of melting of glaciers was 0.22 meters of water equivalent per year (m. w.e. year<sup>-1</sup>). Whereas, during 2000-2016, the glaciers were melted with a rate of 0.43 (m. w.e. year<sup>-1</sup>) - a double than the previous period (Figure 3).

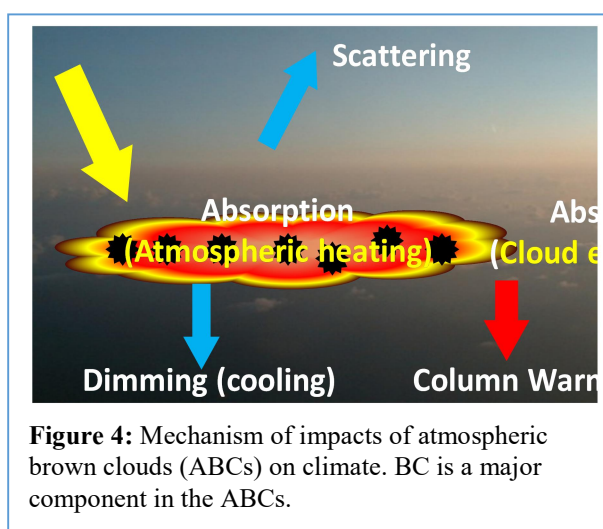
Projections suggested that if the emissions of the Himalayan-climate impacting agents, such as, Greenhouse Gases (GHG) and Short-Lived Climate Pollutants (SLCPs) are continued in the coming decades with increasing magnitude of emission influx, the rate of melting of glaciers could be much faster than one can imagine and by the end of the 21<sup>st</sup> century the two-third area of Himalayan glaciers could be melt. The increase in temperature reduces the amount of snowfall and the snow-fed to the rivers of China and the Indian subcontinent. This is causing less water flow in the summer but flooding in rivers during monsoons. The Gangotri glacier that is the source of the Ganges has receded by 600 meters in the past 40 years.

The drying of the Himalayan-originated river systems could bring a catastrophe to the life of over 2.0 billion people living in South Asia and Southeast Asia whose livelihood depends on the water from these river systems, along with irreversible damage to the delicate Himalayan ecosystems and the environment. The food productivity of the entire region would be severely affected due to the cycle of droughts and floods. It has been estimated that during this century, the accelerated ice melts in the Himalayas flowing into the seas will cause sea levels to rise by one meter. Such a rise in sea levels would destroy fifty percent of the rice fields of Bangladesh. It would also result in millions of 'climate refugees' fleeing from low-lying areas in India, China, Bangladesh, Indonesia, and Vietnam.

## 2.2 Black Carbon – The Biggest Threat to the Himalayas

The role of GHGs in climate change is well understood. For emission reduction of GHGs, needs long-term policies as GHGs remains in the atmosphere for centuries. Policies and efforts at the global, such as the Kyoto Protocol and the Paris Agreement, are already in place to deal with emissions reduction of GHGs. Member countries of these global initiatives are taking a number of steps to curve the emissions of GHGs.

Recent few decades, it was observed that, in addition to GHGs, black carbon (BC) particles are the biggest threat to the Himalayas. BC particles are produced during incomplete combustion of fossil fuels, biofuels, agriculture residue, and open biomass burning and are important constituents of particulate matters (e.g., PM<sub>2.5</sub>), accounting 10-15 percent in most urban regions, sometimes even 30-35 percent in polluted regions. Li et al. (2016) suggest that the total amount of BC reaching to the Himalayan region has been contributed 46 percent by emissions from fossil fuel and 54 percent by biomass burning both from Indo-Gangetic Plain and Chinese region (Figure 5a). BC particles along with other PMs severely affect human health. BC particles strongly absorb incoming solar radiation in the atmosphere and significantly contribute to the warming of the climate. Radiative forcing (RF) or climate forcing and Global Warming Potential (GWP) are two parameters to evaluate whether a substance is a climate warming (+RF) or climate cooling (-RF). The RF of BC is +0.64 Wm<sup>-2</sup> compare to +1.66



**Figure 4:** Mechanism of impacts of atmospheric brown clouds (ABCs) on climate. BC is a major component in the ABCs.

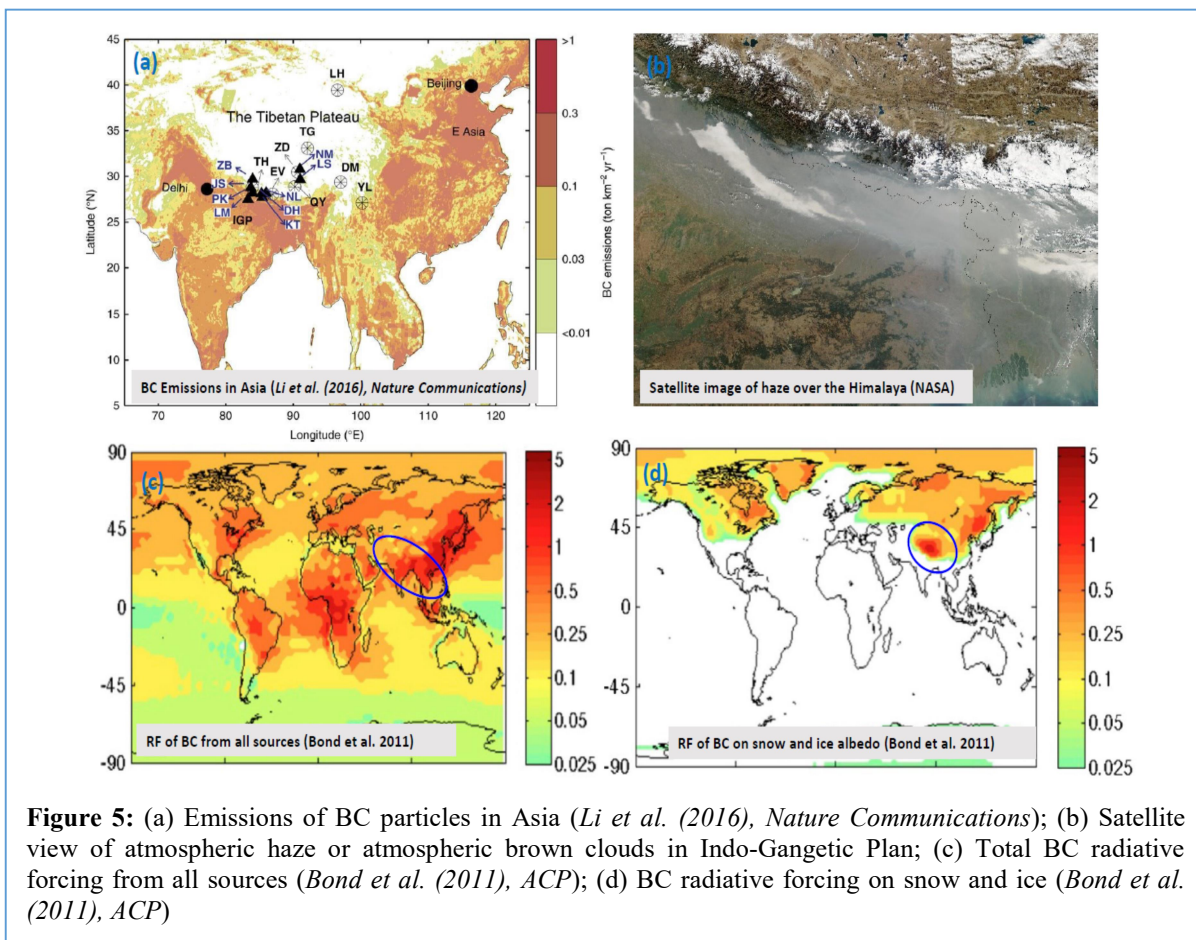
substance is a climate warming (+RF) or climate cooling (-RF). The RF of BC is +0.64 Wm<sup>-2</sup> compare to +1.66

$\text{Wm}^{-2}$  of  $\text{CO}_2$ , which is about half of the  $\text{CO}_2$ . On the other hand, GWP is thousands of times higher than that of  $\text{CO}_2$ . A comparison of the climate warming capacity of BC particles with GHGs and other SLCPs is given in Table 1. A group of pollutants including BC, Methane ( $\text{CH}_4$ ), Tropospheric Ozone (Trop- $\text{O}_3$ ), and Hydrofluorocarbons (HFCs) is collectively called the SLCPs.

**Table 1: Comparison of climate warming capacity of BC particles with GHGs and other SLCPs**

| Forcing Agents       | RF ( $\text{Wm}^{-2}$ ) | GWP (20 years of time) | RT the in Atmosphere                                   | Category    |
|----------------------|-------------------------|------------------------|--|-------------|
| $\text{CO}_2$        | +1.66                   | 1                      | decade to century, about 20% will remain for millennia | Long-lived  |
| $\text{N}_2\text{O}$ | +0.14                   | 298                    | 114 years  | Long-lived  |
| HFCs                 | +0.32                   | 400 -10,000            | 29 years   | Short-lived |
| $\text{CH}_4$        | +0.48                   | 56                     | 10-12 years  | Short-lived |
| Trop- $\text{O}_3$   | +0.35                   | N.A.                   | 4-18 days  | Short-lived |
| BC                   | +0.64                   | 2200                   | 3-8 days   | Short-lived |

BC affecting cloud properties which influence patterns and levels of precipitation. Over the past years, Asian monsoon is weakening and these changes in the Asian monsoon have been attributed to high BC emissions in the Asian. The deposition of BC on the Himalaya and the Arctic resulting in the rapid melting of the glaciers. The impacts of BC on climate are mostly confined to the region of the emissions.



In south Asia and southeast Asia, the residential solid fuels and open burning of biomass or agricultural residues are a major source of BC emissions, followed by emissions from diesel engines of the transport sector (Figure 6).

In the Indo-Gangetic Plain, 40 percent of BC emissions are from residential biofuels, 13 percent from transport, 13 percent each from industries and brick kilns, rest from waste burning and other minor sources (Figure 7).

### 3. ACTIONS NEEDED

To stabilize climate change impacts on the Himalayas and further reduce the impacts in the countries of the Himalayas and the Mekong region, there need multi-dimensional approaches, those may include (1) emission reduction of BC particles from the dominant sources in the region; (2) increasing forest land by planting trees; and (3) advocating and promoting co-benefit approach.

#### 3.1 BC Emission Reduction - Residential Sector

As shown in Figure 5 and 6, the burning of solid biofuels such as wood, charcoal, cow dung, grasses, and agriculture residues is one of the major sources of BC in South Asia and Southeast Asia. Emission reduction of BC from residential sectors can be achieved by providing better fuels such as replacing lump coal by coal briquettes in cooking and heating stoves; by improving combustion technologies such as replacing traditional biomass cookstove with improved cookstove (e.g. fan assisted); by providing clean fuels such as LPG and biogas; and by providing electric cookstove (Figure 8).

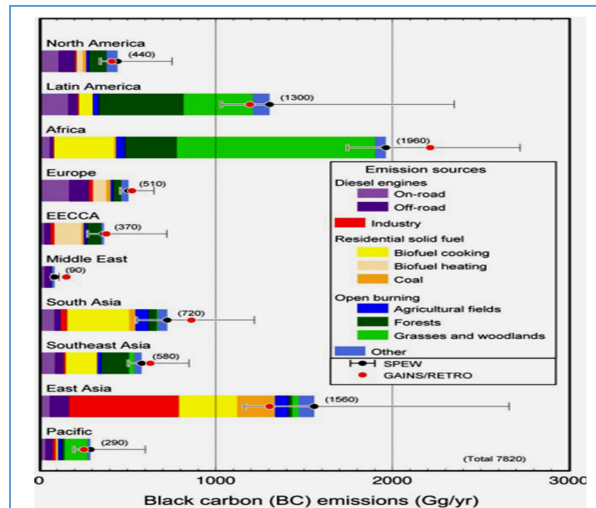


Figure 6: Global emissions of BC (Bond et al. 2013)

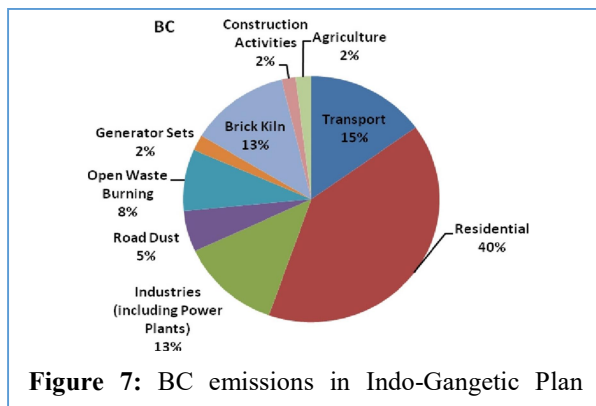


Figure 7: BC emissions in Indo-Gangetic Plain

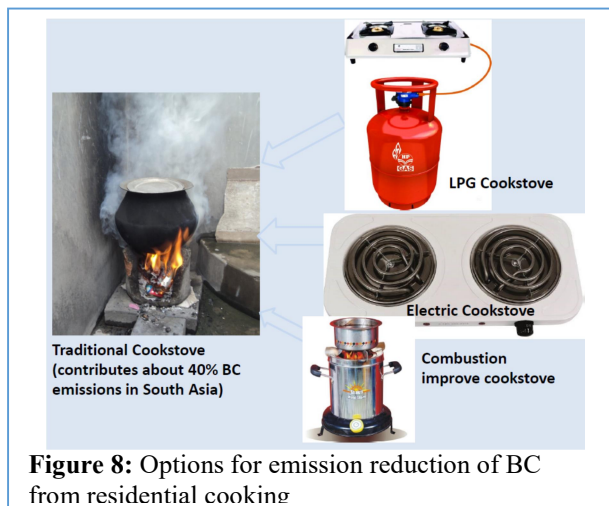


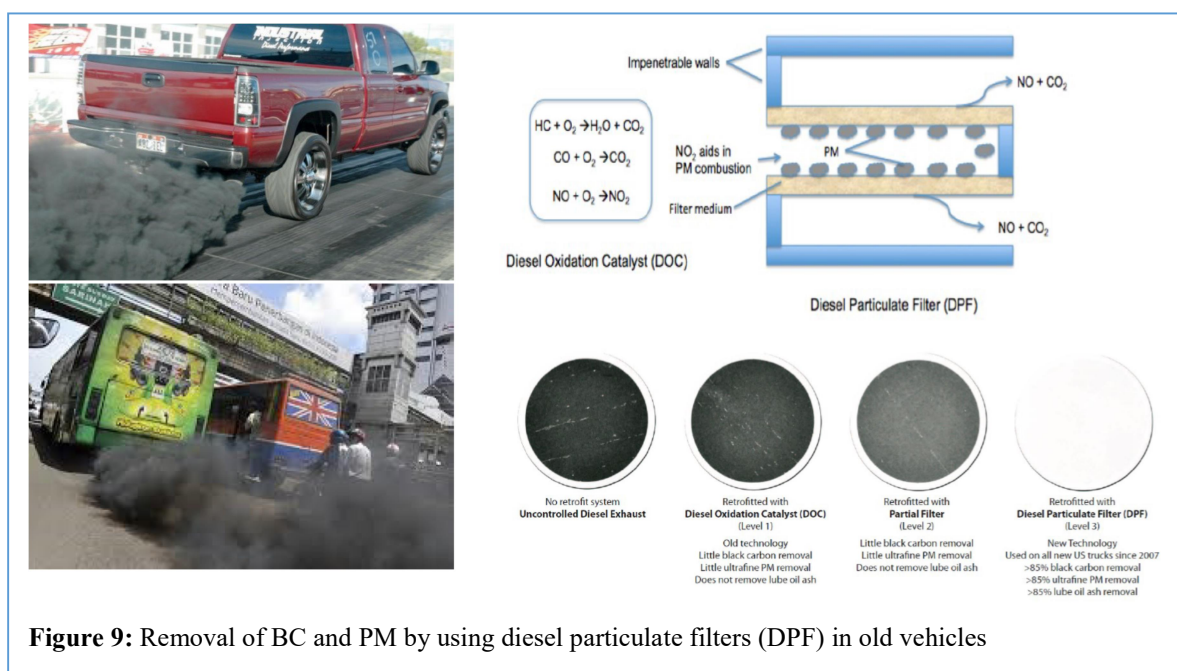
Figure 8: Options for emission reduction of BC from residential cooking

## - Transport Sector

The use of fossil fuels in the transport sector is another major source of BC emission. Especially, BC emissions from the fleet of diesel heavy-duty vehicles in the urban region are one of the dominant sources of BC. In most cities of South Asia and Southeast Asia, the contribution from heavy-duty diesel vehicles and light-duty vehicles to the total BC emissions accounts for more than 50 percent. Emissions from the transport sector are a major source of air pollution in the cities. Therefore, to minimize BC emissions from transport sector, cities could promote electric vehicles, stringent the emissions standards, phase out old vehicles from the road, improve air-fuel mixtures to reduce PM and NOx emission by changing the engine design, remove PM, CO, and HC using diesel oxidation catalyst (DOC), partial flow technology (PFT), and diesel particulate filters (DPF). By installing DPF in the vehicles, 85 percent BC, ultrafine PM can be removed (Figure 9)

## - Open Burning

Open burning of biomass and agricultural waste is one of the major environmental issues in South Asia and Southeast. Especially during winter when prolonged persistence of stagnant meteorological conditions of regional



level comprising high pressure, low wind speed, and lower planetary boundary layer prevents horizontal and vertical mixing of polluted air with the clean air. As a result, the air pollutants accumulate in the atmosphere and thus creates high pollution in the region. To reduce BC emissions from open burning, there must be a complete ban on the open burning of agricultural residues and promote converting agriculture residues into compost or fertilizers.

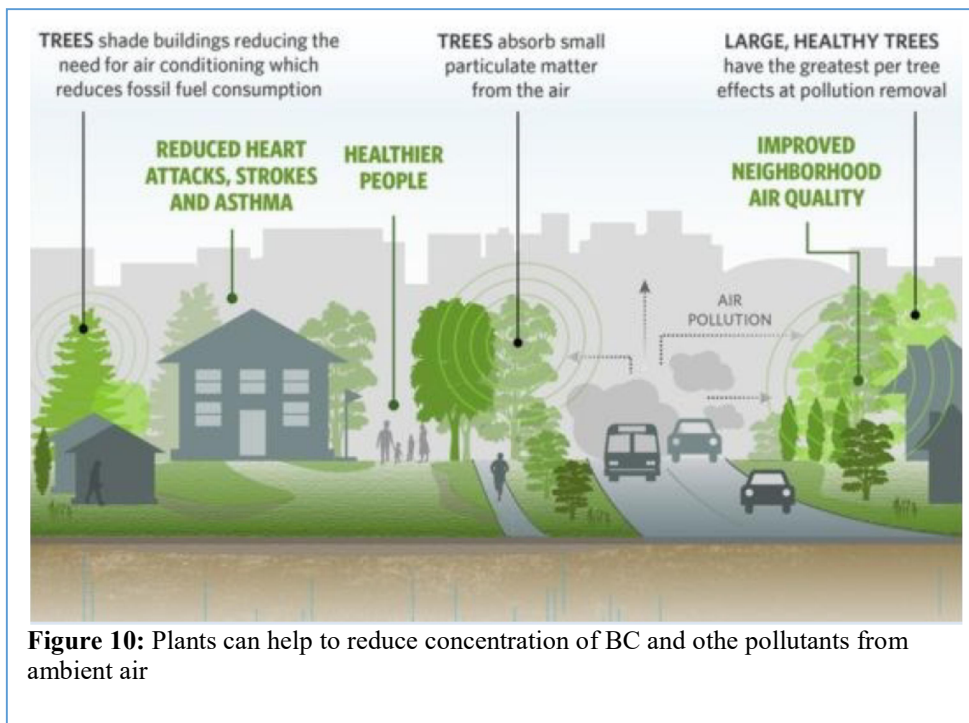
## - Industries and Brick Kilns

Production of bricks in the traditional brick kilns produces a lot of smoke consisting high amount of BC. Brick Kilns also a major source of BC in the urban region of South Asia where brick production is large. Therefore, to reduce BC emissions from brick kilns industries, the old traditional types of brick kilns could be changed to Vertical shaft brick kilns. Also, to reduce emissions of BC from industries, traditional coke ovens must be replaced

with modern recovery ovens.

### 3.2 Afforestation

Plants not only absorb carbon dioxide (CO<sub>2</sub>) from the atmosphere for photosynthesis but also play a pivotal role in improving ambient air quality. Trees, shrubs, and other green plants with a large leaf-surface area adsorb (tend to settle) large particles on their surface. The green leaves of plants absorb ultrafine particles (PM), volatile organic compounds (VOCs), trace gases such as oxides of nitrogen (NO<sub>x</sub>), oxides of sulfur (SO<sub>x</sub>) in their stomata. As VOCs and NO<sub>x</sub> are precursors ground-level ozone, by absorbing VOCs and NO<sub>x</sub> plants help to reduce ground-level ozone. Studies suggested that plants can reduce concentration NO<sub>2</sub> by as much as 40 percent and PM by 60 percent.



Therefore, in order to reduce BC emissions near the source, planting of trees of large surface area in the cities and in the industrial areas are advised. This will only improve the air quality of the region also reduce the chances of transport of BC from the source region to the Himalayan region. Hence, planting trees will provide multiple co-benefits.

### 3.3 Co-benefits Approach

Although this paper didn't include detail on cost-benefit analysis of reducing emissions BC in the region and reduce the chances of transport of BC that to the Himalayas. However, it could be noted, by reducing emissions of BC would bring huge savings by improving health conditions and of people living in the region with considerable savings in the energy sector. Other benefits include the avoidance of disasters caused by climate change, such as bursting of glacial lakes due to increased levels of glacial melt. Huge benefits would also accrue by preventing climate-induced drought/floods in the lower regions such as the Indo-Gangetic plains, Southern China and Bangladesh. Regional strategies for mitigation of Climate Change in the Himalayas and adjoining regions will address key issues such as food productivity and water security for large parts of South Asia, South East Asia, and China. This would again lead to reduced tensions within the region.

## 4. HIMEK ALLIANCE –AN EFFORT TO SAVE THE HIMALAYAS

### 4.1 Guiding Principles



It is well recognized, based on available scientific evidence elaborated above, that climate change is causing adverse effects on the Himalayas and the Mekong Region. As mentioned, the climate change effects of the SLCPs, in particular of BC particles, are quite significant, and therefore emission reduction of BC particles would be beneficial in order to avoid further changes in the climate of the Himalayas and Mekong Region, and promoting forest landscape restoration would increase carbon sequestration.

Partners share concerns about the effects of climate change on the Himalayas and Mekong Region and recognize the need to promote regional efforts on climate change mitigation and adaptation in the Himalayas and Mekong region, with special focus on emission reduction of BC particles and forest landscape restoration and address the challenges associated with these efforts.

#### **4.2 HIMEK Alliance – The Framework**

In principle, the HIMEK Alliance is intended as a regional cooperation framework between the Himalayan countries and the countries of the Mekong Region to promote efforts on climate change mitigation and adaptation in the Himalayas and the Mekong region to reduce and avoid the adverse effects of the climate change on the Himalayas and the Mekong region, with special focus on emission reduction of Black Carbon particles and forest landscape restoration.

#### **4.3 Objectives**

With guiding principles and intention to implement Actions mentioned above, the alliance have the following objectives:

- 1) Assist the countries of the Himalayas and Mekong region in planning and drafting of a strategy for emission reduction of SLCPs, in particular BC particles, and forest landscape restoration in the regions;**
- 2) Submitting joint project proposals on the HIMEK Alliance to funding agencies in order to secure funds for the implementation of the HIMEK Alliance; and**
- 3) Implementation of activities, such as conducting research and assessment, publication of reports, organizing workshops, seminars, training, etc.**

#### **4.4 Advocacy of Joint Strategy**

A joint strategy by the Himalayan countries and the countries of the Mekong Region will have tremendous advantages. It will ensure that there is an integrated, time-bound approach to tackling the issues with the active involvement of interested international agencies. A joint strategy for emission reduction of BC and afforestation may include activities:

- (a) Identifying the extent of the zone requiring intervention. This would include the Himalayan ranges and contiguous areas including the Mekong basin. Broadly, the Himalayan ranges would be the core zone and the contiguous areas would be the outer zone. Initially, the outer zone could be for a radius of 50 km from the core zone and the Mekong basin. The outer zone could then be increased periodically till a maximum laid-down radius is covered under the action-plan.
- (b) An analysis of the interventions required in the core zone and the outer zone in order to reduce emissions and mitigate climate change and to stabilize the effects of global warming to the extent possible.
- (c) The countries concerned will then have to sign an agreement on the various interventions and the time frame within which these will be implemented.
- (d) The process will need to be facilitated by other international agencies and organizations. These organizations will also be involved in the required funding mechanisms.

#### **4.5 Suggested Interventions**

Certain measures that could be considered are enumerated below. Some of these will have to be applied more stringently and on priority in the core zone as compared to the outer zone.

**(a) Industries****(b)**

Certain types of industries will have to be banned and phased out. Alternatively, they should be permitted only on the introduction of upgraded technology that will sufficiently minimize emissions. They will also require financial assistance to incorporate cleaner technologies. There is good scope for reducing BC emissions by improved technology for thousands of brick kilns in the region. Nepal, Bhutan and Bangladesh may need financial support for installing cleaner technologies. An international funding mechanism will be required for this purpose.

**(c) Automobiles**

Automobiles in both the core zone and the outer zone should convert to environment-friendly fuel. As far as the Govt of India is concerned, priority for converting to CNG or LPG should be given to Jammu, Dehradun, Srinagar, Shimla, and Manali. All the countries concerned maintain a very large military presence in the core zone. Adequate mass transport facilities such as buses should be provided for tourists and pilgrims.

**(d) Road Construction activity**

There are constant road constructions and maintenance activities in the Himalayan region. The obsolete road construction methods require burning large quantities of coal tar. This contributes substantially to the GHGs and BC aerosol emissions in the Himalayas. Hence there is an urgent need to introduce cleaner technologies for road construction and repair in the Himalayas.

**(e) Demography**

Demographic pressure always translates to greater levels of human activity. Concentrations of populations should be avoided. The Governments should encourage well-planned satellite townships in the Himalayan region, rather than increased growth of cities such as Kathmandu, Jammu, and Shimla.

**(f) Forest Land Restoration**

An intensive forest land restoration programme by the countries will be of vital importance. The establishment of transboundary National Parks could be considered. This would be a useful initiative by neighboring countries to improve the management of forests along border areas. Ecological Territorial Army Battalions comprising of ex-servicemen will be able to play a very important role in forest land restoration in the Himalayas in India.

**(g) Improved technologies in domestic fuel consumption**

There is a good scope for improving technologies for domestic fuel consumption requirements, such as cooking. The National Programme on Improved Cookstoves (NPIC) in Himachal Pradesh, the Western Himalayan Indian State is a good example. Such initiatives will have dual benefits of emission reduction combined with improved health of women and children.

**(h) Land use practices**

Burning of huge Agriculture residue such as paddy in the North Indian State of Punjab and could have a direct influence on the Brown Clouds over the Himalayas. Burning of agriculture residue is also a common practice in some of the Himalayan states. The fires from the fields frequently spread to the Himalayan foothills causing forest fires. These issues need to be addressed in the areas close to the Himalayas. There is considerable stress on the

Himalayan landscape due to the pressures of over-grazing. Slash and burn cultivation in Eastern Himalayas must also be taken into account. \_

(i) **Mega-City hot spots**

There will be a need to concurrently reduce BC emissions in some of the identified mega-city hot spots closer to the Himalayas. These could be Delhi, Kolkata, Dhaka, and Karachi.

**0404031 ROSELENE, HELEN (Department of Environmental Science Mount Carmel College). AIR QUALITY ON THE URBAN ROAD SIDE OF BANGALORE CITY**

Urban trees play an important role in ecological balance in human habitats, they filter air, water and sun light, provide shelter to animals and recreational area for people. The benefits of urban trees are many; including beautification, reduction of urban heat island effect, Vegetation naturally cleanses the atmosphere by absorbing gases and some particulate matter through leaves. There is a growing impetus for green belt expansion in urban areas. Identification of suitable plant species for green belts is very important. Air quality-Suspended Particulate matter in the following area Mekhri circle, Bannerghatta road, race course road, sarjpur road, magadi road, Jeevan biman MN road, Hennur road, Bhansankiri road, Lalbagh Road, NGEF MN road using high volume air sampler. The tree on road side available were Rain tree, Mahogoni Copper pod, Gulmohar. was studied for the air pollution tolerance index, the parameter studied were chlorophyll content, ascorbic acid, pH content and moisture content of leaf. Observed result shows that the SPM concentration in areas without trees is more than permissible limit  $717\mu\text{g}/\text{m}^3$ . However Siddapura Road, Magadi Road has high SPM due to heavy density vehicle. There is a significant difference between the SPM concentration in regions with tree and without tree on roadside. (t test value 3.442 at 0.05 levels.) In the present study, the Air Pollution Tolerance Index (APTI) of plant species on the road side has been evaluated by analyzing important biochemical parameters. The present study shows that trees that grew in study site area were Rain tree, Gulmohar, Copper pod, and mahogany. Of the trees studied Gulmohar had high APTI (12.2) since it had high chlorophyll content (3.64) and ascorbic acid content (11.6) compared to other trees. Bangalore is now seeing a drastic change in its infra structure due to the ongoing metro rail project, its roads are expanding and vegetation covers are disappearing to accommodate vehicular density due to increased urbanization. This study would prove to be instrumental in future restoration project by suggesting the right species to be planted along the road side to mitigate air pollution.

**Key words: Suspended Particulate matter, Air pollution tolerance index, Chlorophyll, Ascorbic acid, Air quality for suspenses**

## 08. INFORMATION TECHNOLOGY MASS MEDIA AND CULTURE

**0408032 BALASWAMY, B (Department of Journalism and Mass Communication, Osmania University,Hyderabad-500007). INFORMATION TECHNOLOGY, MASS MEDIA AND CULTURE**

Information Technology has brought phenomenal changes in all walks of life. The digital technologies have had significant impact on mass media and culture. Online newspapers have changed the nature of newspaper in terms of rapidness in disseminating the news and feedback. Television and radio programmes are now available in different platforms. There are phenomenal changes in film technology and reception. Information technology has brought global people together. Smartphone culture is increasing day by day. People are connected through social media and share variety of messages. Friends, family members, alumni, classmates, and ideological groups are maintaining WhatsApp groups. This paper analyses the interface between information technology, mass media and culture.

### Introduction

Information technology has brought phenomenal changes in all walks of life. Information technology the technology involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data(webster.com). Different devices, which include desktop computers, lap-top computers, palm-top computers, tabs and smart phones are used with internet connectivity for different activities. Information technologies are digital technologies. They are used for producing, processing, storing, modifying and multiplying the information. They have facilitated the convergence of different media. Their application is broad and cuts across all interpersonal and mass communication media, giving more power, robustness and veracity to their operations and performance. ICT is now an indispensable part of everyday-existence of every radio/television station and newspaper/magazine outfits(Gapsiso & Wilson, 2014). One of the largest industries that social media has had an effect on is news and journalism. Since, the Internet is now the fastest and easiest way to get news, print media is diminishing and publications are being forced to post their articles in online platforms. Another effect of this advanced technology is that virtually anyone can now deem themselves a “journalist” and produce news that they feel is accurate and credible. Almost instantly we can create, share, and spread newsworthy or gossip stories across the globe. Social media has only made this easier. Top news stories are being broken via Twitter and other social networking sites and people worldwide are made aware of them almost instantaneously. The power of social media has allowed our society to be much more knowledgeable of worldwide affairs and news (Digital Performance Marketing, 2019).

Whats App has brought noticeable changes in interpersonal and group communication. It is also used for dissemination of news and views.

Culturally using information technology, itself, has become a new culture. Telephone has become part and parcel of the lives of people today. Digital literacy is growing continuously. The new media technologies have empowered the women and marginalized section to ventilate their views. Wherever we go, carrying the cell/smart phone has become a common practice. Smart phone has brought selfie and chatting culture. Usage of social media is a glaring change in the society. For different purposes, people are using social media networks and their number is increasing day by day. As the smart phone has multiple functions, people are using it as a still camera and video camera. Today everybody who is using smart phone has become a photographer. It is also used as editor, scanner, calculator, radio, television, recorder and cinema theatre. Information technology is also used by some people for the business of pornography, which is having further influence on the culture. The existence of the internet provides the ease of accessing pornographic content causing pornography to be higher in its spread. The existence of pornography is out of control. Research in the United States has shown that 66% of men and 41% of women consume pornography every month. This number is increasing due to the presence of pornographic content on the Internet. It proves technological developments also affect the spread of pornography (Saputra,et.al, 2017)

## **Information Technology and Different Fields**

Information and communication technologies have occupied an important place in different fields. They have become like electricity. Whether it is education, health or transport, all fields are functioning effectively because of the information technology. People are now empowered by the Information technology. They can book a gas cylinder with just a phone call. They can get a book or order the food just by using certain Apps. Whether airlines, railways, road transport corporations, hotels, hospitals, universities, courts, police stations, all are using information technology for the better performance.

### **E-governance**

E-governance, as it is widely known at present, can be described as the application of the emerging information and communication technologies in the processes of governance, so as to bring in a profound institutional change in the way the government services are delivered to the citizens. Basically it aims at enhancing citizens' access to government information and services. It makes the citizen the focal point of government in terms of delivery of its services. Though there is a broad agreement on the definition of e- governance and what it encompasses, the nature of its implementation differs in scope, budget allocations, resources, availability of skills and technology and the government's vision as a whole from country to country( Kennedy, 2012). The Information Technology Act, 2000 provides a legal framework for electronic governance in India by giving recognition to electronic records and digital signatures. It also defines cyber crimes and prescribes penalties for them. It is based on the UNCITRAL Model Law on International Commercial Arbitration recommended by the General Assembly of United Nations by a resolution dated 30 January 1997.

The nature of polity, public administration units, political culture, ethno-sociological divides, and to a large extent, the divides along economy, geography (urban-rural), gender, define and determine the conditions for good governance. Bringing in technology in to the governance was resisted by the traditional administrations, especially in the developing world including India. However the situation is gradually changing for the better. The success of various e-governance projects in different parts of the country bear testimony to this changing scenario. Citizens are gradually getting accustomed to the e- governance. Instead of carrying paper tickets at airports, trains, buses and cinema halls, people are using just electronic messages. This culture is saving lot of paper, energy and time, moving a step in the direction of sustainable development.

### **E-mails**

Before the advent of information technology to the doorstep of common man letters were sent through postal department. Writing letters and receiving letters from family members, relatives and friends living in distant areas was a noticeable cultural feature. Tough people are still using the postal department for different purposes, sending personal letters through post has reduced significantly. People are using e-mail for both personal and official communication. The electronic mail system has reduced the work of postal department to a great extent. A great advantage of e-mail is -messages are delivered instantly. Another benefit is being the transmission of messages without costs. The information technologies have facilitated the evolution of enhanced mail order retailing, in which goods can be ordered quickly by using telephones or computer networks and then dispatched by suppliers through integrated transport companies that rely extensively on computers and communication technologies to control their operations(Lee, n.d.).

### **E- Business**

Information technology has changed the business culture. People are now a days going to shops not with cash but with credit and debit cards. Many people are not even going to the markets. They are just ordering from their houses and offices and getting delivered the products. Flipkart and Amezon.com have brought phenomenal

changes in the purchasing methods and behavior of consumers. One of the most significant outcomes of the progress of information technology is probably electronic commerce over the Internet, a new way of conducting business. Though only a few years old, it may radically alter economic activities and the social environment. Already, it affects such large sectors as communications, finance and retail trade and might expand to areas such as education and health services (Lee, n.d.)

### **Mass Media and Mass Communication**

Digitization has increased consumer control over media content and advertising, with implications for advertising avoidance, advertising targeting and personalization, competition among media platforms, and media market outcomes. In addition, consumers increasingly use a “second screen” to multitask during media programs, enabling immediate online response to program and advertising content, but also offering new opportunities to divert attention (Kenneth & Wilbur, 2015). One important feature added to the mass communication due to information technology is feedback. Earlier notion of feedback in mass communication was that either it is delayed or inferential. But today, due to the digital technology immediate feedback is facilitated.

### **Newspapers- Online Newspapers**

Information technology has transformed newspaper journalism in many respects. Every conventional newspaper has started its online newspaper and e-newspaper. While e-newspaper is available in PDF form to the readers, online newspapers not only provide the updates from time to time, they also provide some video content to the users. Newspaper readers are in more advantageous position today than earlier. Before the advent of e-newspapers and online newspapers, people in remote areas would get the newspaper after two days of its publication. Newspapers readers in southern Assam would receive papers like *The Hindu* and *Eenadu* after two days of their publication. But today a newspaper reader can access any newspaper from any part of the world. Besides, they can get the information at the free of cost. Now a days people while travelling to their working places are accessing the newspapers through their smart phones and tabs. They can have access to any number of newspapers in this mode. A significant development in online journalism is user can give feedback immediately. The information technology has facilitated interactivity between the producers and users of news content. A major benefit about reading online news is that a reader will be updated in a matter of minutes after the news is out, while in newspapers readers have to wait for the next day. Another benefit is that it save a lot of time and money as readers don't need any one to deliver it to their house neither they need to wait for it. And of course it saves a lot of papers too.

### **Radio- radio Apps-web Radio, Satellite Radio FM Radio**

The news processing in the media particularly the broadcast media seem to be witnessing a revolution that is changing the process of news collection, editing and dissemination. This change has been brought about by the advent of Information and Communication Technologies (ICTs). Today radio programmes are made available through different devices. In smart phones, radio apps are downloaded to listen conveniently. In radio programme production process also the radio stations have shifted from analogue to digital technologies. Earlier programmers used to read out the feedback letters sent by the listeners through postal system. Now-a-days, the programmers are reading out the letters sent through e-mails by the listeners. For instance, Vanithalokam is a women's programme broadcast by All India Radio in Telugu. By downloading radio apps, like AIR app, listeners can have access to AIR programmes of all languages. In a multi-cultural country like India, it is right platform.

### **Television and Information Technology**

Digital television or DTV can be defined in two unique ways. According to one definition, it refers to the digital transmission of television signals by television operators, whereas, according to the other definition DTV refers to the modern TV formats including the HDTV (high definition television) and the ITV (Interactive television). The second aspect of digitalization is the most widely used aspect when it comes to determining the impact of digital television on the global technology market (Baxter, 2013). DVR, digital video recording

technology, is the ability to time-shift viewing by recording programs to watch later remains popular among older adults. It's used by almost 50 percent of households. However, younger age groups are starting to replace DVR usage with streaming services like VOD, video on demand. VOD allows viewers to watch programs or movies in real time or download them to watch later. Programs can be viewed free with some networks or through paid services like Netflix and Amazon Instant Video. This technology allows access to a broader range of programming on mobile devices, anytime, anywhere. Viewers no longer have to be tied to their TV set and a DVR device. The transient nature of television has changed with digital technologies. Many channels are making available through you tube. Audience can view them at any time according to their convenience. Indeed, it has become a revenue generating model for television channels.

### **Digital Cinema**

Today there is lot of change in the process of film making right from the stage of scripting to shooting , editing, publicity and distribution. Certainly information technology has brought these changes. As computer itself has become both pen and paper, the scripting is done in computer. For research information technology is used. In recent times there has been a steady rise in use of digital cameras (cameras that capture images in digital format rather than on films) in Hollywood and all other movie industries around the world. Though few big budget Hollywood movies of recent times were shot using film cameras, the industry currently is relying mostly on digital equipment for producing films. More than 90% of Hollywood films are shot using digital cameras today. The cost of production is low for movies produced using digital cameras. This is one of the major reasons why filmmakers from around the world are preferring digital over film cameras for making movies. Today, we have aspiring film makers who use equipment as simple as a mobiles and handy-cam to make movies. The capability of digital technology has simply destroyed all conventional boundaries and has opened the door for a new world of great possibilities (iNurture Education Solutions, 2016).

When analogue technology was used, distribution of the film reels was a cumbersome task and costly affair. The digital technologies have reduced the cost of production and made the process of production more convenient. With digital technology, the storage method has changed and today it is much easier to handle and transport movies to theatres than in the past. Servers, hard disks and video tapes are being used to store movies and digital projectors are being used to screen them. There are other alternative platforms new-age film makers are looking at. Internet has made it possible for filmmakers to showcase their film to audience of a greater geographic range. Social media platforms and all other online promotional strategies can be adopted to ensure that the movie reaches out to more number of audiences from around the world.

### **Social Media**

A remarkable impact of information technology is the emergence of social media. In today's society, the use of social media has become a necessary daily activity. Social media is typically used for social interaction and access to news and information, and decision making. It is a valuable communication tool with others locally and worldwide, as well as to share, create, and spread information. Social media can influence consumer's purchase decisions through reviews, marketing tactics and advertising. Essentially, social media vastly impacts our ability to communicate, form relationships, access and spread information, and to arrive at the best decision( insegment.com) . Social media is defined by its interactivity, connectedness, and user-generated content. Perhaps the most influential social media tool is social networking sites. *Facebook, Twitter, Tumblr, Blogger, and LinkedIn.*

### **Plagiarism**

With the over flow of information through world wide web, copying and pasting of the information , which leads to plagiarism is increasing. It is more so in educational and research institutions. As computer is acting as substitute to both pen and paper, most of the times the present young generation students and scholars are moving from paper books and journals to the digital resources. The changing culture of information use among the Net Generation of students has introduced a new element to the problem of plagiarism for educational institutions.

Whereas in the past plagiarism involved a certain amount of intense labour usually from a limited number of print resources, technology and the emerging culture of use amongst the Net Generation facilitates the sophisticated manipulation of information from a large number of electronic sources (Combes, 2005). Various steps have been initiated by different organizations to control the plagiarism. Some softwares are used now to check the extent of plagiarism.

### Smartphone Culture

As an innovation, smart phone has diffused in the social systems very fast in spite of its expensive feature. Steve Jobs, the founder and former CEO of Apple, is credited as a visionary for the advent of the iPhone and the smartphone device in general. Truly, in less than ten years' time, the smartphone has changed the fabric of our society. Huge swaths of our population now carry the internet wherever they go and have the ability to communicate in an endless number of mediums and channels with others around the globe. It's hard to exaggerate the impact smartphones have had on our daily lives and our culture at large (Mindsight, 2019). With more than 1 billion users worldwide and 2.5 million apps – available across Google and Apple's digital marketplaces, smartphones are impacting day-to-day life in some surprising ways. The adoption of Smartphone has been tremendous all over the world. Surveys show that 80% of the world population use mobile devices and 42% of mobile subscribers in the US use Smartphone. According to a survey by Compete, a web analytics firm, a large number of people almost up to 65% is using their Smartphones to read news feeds, post status updates, read & reply to messages and post photos. This shows that now people are leaving PCs and moving towards Smart phones.

Smartphone has impacted almost all walk of human life. The prominent areas, where impacts of Smartphone are obvious include business, education, health, and social life. Mobile technology has drastically changed the cultural norms and individual behaviors. The impacts are both on the positive side and also on the negative side. There are several ways that can help control and minimize the negative impact of Smartphone use in society by educating users on how to use Smartphones smartly.

### Conclusion

Information technology has brought remarkable changes in mass media and culture. In production processes the media organizations have shifted from using analogue technology to digital technology. Besides, the information technologies have facilitated making availability of media content on multiple platforms. Newspapers are forced to compete with 24 hours television news channels by starting their online editions with multi-media features. Social media have empowered common people to reach the people at global level. Digital media have brought the feature – interactivity to mass communication. These new technologies have tremendous impact on cultures from global to local levels. Today almost everybody is identified by a UID and connected by a mobile number and/or e-mail. The number of people using social media is increasing day by day. The e-governance, e-marketing, e-transactions and different types of Apps have made the lives of people more comfortable and ushered in a new culture, which may be termed as smart phone culture or cyber culture. These technologies have the concomitant side effects-which include plagiarism, cybercrimes and pornography.

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## 09. LABOUR IN ORGANIZED AND UNORGANIZED SECTOR

### 0409033 MANN, JEET SINGH (National Law University Delhi). REFORMS IN THE PROTECTION OF THE WORKFORCE IN ORGANISED AND UNORGANISED SECTORS IN INDIA

**Labour law In India primarily protects only 25 percent of the total workforce employed in organised and unorganized.** Around 75% of the total workforce, employed in the unorganized sector, are hardly covered any adequate protection of labour laws. Labour laws in India do not have universal coverage. Labour laws in one or the other form based on the requirements of number of workers employed and salary restrictions apply to selective workers/employees/labourers in India. There is also a wide gap between workers rights in theory and practice.

Workers engaged in the unorganized sector are highly susceptible to exploitation because of low bargaining ability for better terms and conditions of employment and low demand, high supply of manual or unskilled workforce, and nature of employment. Although the Central and State Governments enacted some labour laws covering social security dimensions of workers' rights in unorganized sectors, such as Minimum Wages, employee compensation, MNREGA, and other relevant laws, Ineffective enforcement of the prevailing laws have also aggravated the deplorable conditions workers in the unorganised sector.

It is also seen that in the era of liberalization, privatization and globalization, the State is also facilitating the contractualization of workers in the name of development and inviting foreign investment. Due to the Labour policy shift of the State, the Apex judiciary, especially in case of retrenchment, disablement compensation, and regularisation of contractual workers, has also deviated from liberal interpretation of the social welfare legislation to literal interpretation for the protection of working force the welfare.

It is also very pertinent to note that No sustainable development at the cost of exploitation of workers can materialize across the globe. In order to take care of the multiplicity of labour laws, the Government of India has introduced labour reforms in the form of four Labour Codes on Industrial Relations, wages, social security, and working conditions& Safety. After analyzing these four labour codes, it is revealed that the Ministry of Labour and Employment, without ensuring functional integration of all the relevant labour laws in each labour Code, have consolidated labour laws into four categories. It is also a matter of deliberation, whether, the proposed Labour Codes and existing Labour Code on Wages would be in a position to protect workers rights in practice in india?

Finally, the Thematic Panel on “**Workers in organised and unorganized Sectors**”, which is also composed of experts on labour law, will deliberate upon the contemporary challenges arising out of labour reforms, Liberalisation, privatization and globalization, skill development, and future of works for the workers engaged in organised and unorganized sectors in India.

### 13. PEASANTS LIVELIHOOD AND LAND-USE

#### 0413034 PAIKADA, ALEX (Institute of Societal Advancement, Trivandrum). INDIAN PEASANT, TO BE OR NOT TO BE

Something is rotten in the state of Indian peasantry, the stench of slow death is reeking from behind the timeless scaffoldings. The farming sector has long ago ceased to be the prime mover of Indian economy. In the long march of economic progression, India is struggling to be an industrial power to be reckoned with. However, the Indian peasantry, weighed down by the weight of at least 5000 years, has always been taken for granted. They stoically pay for the sins of the governments that come and go, they bear the brunt of the economic havocs, they cushion the shock waves the nation is often battered by. Even today the farming community accounts for more than half of the population and its impotent silence is the prime capital of the powers that be.

The Indian peasantry, scared and dazed by the roar of tech savvy corporate juggernauts, very much reminds us of Edwin Makham's landmark poem which appeared in 1898, 'Man with the hoe'. The picture he presents may be of academic interest in the modern west where things are much different in the modern times. In india, however, the picture he presented becomes a haunting near to life pernicious reality, too glaring to be ignored.

'Bowed by the weight of centuries he leans  
Upon his hoe and gazes on the ground,  
The emptiness of ages in his face,  
And on his back the burden of the world.  
Who made him dead to rapture and despair,  
A thing that grieves not and that never hopes,  
Stolid and stunned, a brother to the ox? ...

Through this dread shape the suffering ages look;  
Time's tragedy is in that aching stoop;  
Through this dread shape humanity betrayed,  
Plundered, profaned and disinherited,  
Cries protest to the Judges of the World,  
A protest that is also prophecy.

How will it be with kingdoms and with kings—  
With those who shaped him to the thing he is—  
When this dumb Terror shall reply to God  
After the silence of the centuries?'

The symptoms are too much there, like the writing on the wall in ancient Babylon. In 2018, in Maharashtra state alone, more than 60,000 suicides had taken place, with an average of 10 suicides every day. During the last 23 years 296,438 Indian farmers had taken own lives as they had reached the end of the road. The data available with the national crime records bureau may be off the mark as many states try to downplay the social disaster and show the numbers much less than the actual ones to save face. Even then, it is evident that there is a problem. The social scientists attribute the reasons for this major epidemic as high debt burdens, poor government policies, corruption in subsidies, crop failure, personal issues and family problems. Yet, there is more to it than meets the eye.

Globalization and consumerism have impacted all rungs of the society in more ways than one. For many centuries, money had not been playing a pivotal role in the domestic economy of the peasant households. They were by far self-reliant in terms of food and essential materials. Cash crops had not played a significant role in the destiny of the peasantry. Farming activities had a ritualistic overtone synchronized to the march of dancing seasons. And there existed a mother son bonding between the farmer and the soil.

During the colonial period brutal landowners and greedy administration used to fleece the farming community to utter penury. Though a docile and by far silent species, peasant revolts became regular in the 19<sup>th</sup> century as the majority community, farmers, was bled white by the powers that be.

In the modern times money has begun to play a critical role in the lives of the community. As a result, the approach towards the soil has changed over time. Drive for intensive farming needed different kinds of seeds, chemicals, hydrology, machinery and approach. Intensive farming led to more plant diseases, depletion of micro-nutrients, and more investment. Increased reliance on agrochemicals, especially pesticides, pushed the farmers to a vicious circle from which there was no escape. A group that capitalized on the new situation was the local money lenders and banking community. A failed harvest or a price crash on the market always put the farmer on tender hooks. Indeed, farmers are the most vulnerable and defenceless section in the country. They cannot decide the price of their produce, the tyranny of the market will decide what they are worth, if at all. And there are strong cartels that muffle and manipulate the market dynamics. In this ruthless gamble, most often than not, the farmer stands to lose. With his ancient pride and battered self-esteem, having none to turn to, oft being left in the cold when it comes to government level support, they are left with only one option, to end it all and parachute out of a demeaning life. Studies dated 2004 through 2006, identified several causes for farmers suicide, such as insufficient or risky credit systems, poor agricultural income, absence of alternative income opportunities, a downturn in the urban economy which forced non-farmers into farming, and the absence of suitable counselling services.

In Kerala, most of the farmer suicides happened in the districts of Wayanad and Idukki, and both are the least urbanized and thoroughly agrarian districts. The major cause that drove the hapless peasants to the jaws of death in almost all instances was debt trap and crop failure. Commercial farming is an enterprise where big money is involved, it is something the traditional farmers are not necessarily familiar with.

The puny traditional farmer has to compete with global giants who are into massive farming armed with monstrous machineries and modern precision farming methods. The large corporates have enormous lands at their disposal and the production process is not labour intensive. More so in the case of fruits, food grains and cash crops. The liberal import policies favourable to the south and south east Asian countries have also resulted in an existential crisis. Pepper and rubber farmers, accounting for 1.5 million families across the board, are deleteriously affected. Vietnamese pepper routed through Sri Lanka is flooding the market, tolling the death knell of pepper farmers.

As traditional farming has become less sustainable, and as they have long ago lost their competitive edge against the corporate giants, in the northern plains, farmers are abandoning the land and migrating. This enormous migrant workforce, mostly unskilled, running into millions, has become a very fluid social phenomenon in the country.

India's soul is indeed in the villages and its life and culture are steeped deep in the soil. Without a progressive and upbeat farming community the country cannot steam ahead as it accounts for around 65% of the total households. The collective Indian psyche is a unique one, it is not impressed or unduly excited by the boisterous debut of modern technology. Silent fortitude is the forte of the nation, hence, nucleation of revolutionary ideas is beyond her scope of things.

As an old poem aptly pen pictured the nation,  
 'The east bowed low before the blast  
 In slumber and deep disdain  
 She let the legions thunder past  
 And plunged in thought again.'

## 16. POLITICAL ECONOMY OF INDIA

### 0416035 MURTHY, R V RAMANA (School of Economics, University of Hyderabad, Hyderabad). POLITICAL ECONOMY OF INDIA: CAPITALIST GROWTH AND ITS PERILOUS PASSAGE

I am deeply indebted to the Indian Social Science Congress for choosing me as the Chairman of the interdisciplinary thematic panel on 'The Political Economy of India' of the 43<sup>rd</sup> annual conference of Indian Social Sciences Congress, being conducted in Bengaluru, the historical cyber city of India. As chairperson of the political economy, I express my appreciation to the organization to recognize political economy as meaningful field of inquiry of capitalist development, which has to be steered in the utmost useful way to the people and transcend the ideological boundaries in its epistemology for a true understanding. Societies and economies evolve as a part of civilization, through a complex interaction of different social and natural forces. The study of capitalist economy traditionally was called political economy in the 18<sup>th</sup> century in Europe, the tradition laid down by Cantillon, Adam Smith, Ricardo, Sismondi, Marx, and the institutional economists like Schmoller and Frederic List. Moral philosophy was not far from political economy. The idea of value, property right, labour, nature of regulation, national interest and so on were primarily conceived as subjects of the interest of the capitalist class who is imagined to be the captains to steer the wealth of the society and help to increase its welfare. The Utilitarian vision of capitalist system assumes the greatest happiness to the greatest number of people as the principle of justification, without committing anything about its distribution. The modern liberals, like John Rawls laid down the criterion that demands a constant improvement in the lowest rungs of the society, at least in absolute terms. This is the best justification for people to accept capitalism, which is based on economic authority of property owners to exist as legitimate system where the interests of the weakest are also met. So what is political economy? And political economy of India? Political economy is an interdisciplinary discourse of capitalist development to examine the its evolution, premises, structures, interplay of its stake-holding classes, its consequence advancing the material welfare of the society in an equitable way, and transcend the contradictions of the system. Therefore the political economy of India is to locate the historical evolution, examine the process, the strategy and the potential of the economic growth to advance the welfare of the society. While is an extensively wide canvass that comes under this theme, I shall throw light on a limited set of issues concerning the political economy of capitalism of India, for the reasons of time and space constraints.

Marx, the radical critic, declared capitalist system, in spite of its historical role in human progress, as not only an immoral system rested on hidden exploitation of the working class but also as an unsustainable system with all its internal contradictions. While capitalism achieves extraordinary growth, connecting global resources, yet suffers from progressive crisis of falling rate of profit, owing to internal and external contradictions. Hence, instability in short and long run are argued to be inescapable by the capitalist system. However, protagonists of capitalism never acknowledged such inimical instability of the system. Late 19<sup>th</sup> century mainstream economists progressively disassociated with very term political economy, its methodological approach and its tools, went on to build exclusive economic view of capitalist economy, since beginning of the 20<sup>th</sup> century. Neoclassical view that represents the quintessential representative of a free markets, based on principal-agent framework, with Pareto efficiency as the guiding, is the classic defense for laissez faire economics. The true representation of it is given by the Libertarian philosopher and unrepentant believer, Frederic von Hayek, while its 'scientific' exponents are Alfred Marshall and Leon Walras. The Liberal and Social democratic, on the other hand, holds a different perspective on capitalism, from the historical experience; are highly vary of a market failure possibility, in spite of the dominant existence of capitalist class, favours state intervention in production and distribution as necessary for social and economic good. Neoliberal view holds supreme virtues of private and corporate sector in terms of efficient resource allocation. Each of these views have also come at different historical junctures and stages of capitalism that evolved over more than two centuries. There is more art involved in understanding the evolution of capitalism and it's functioning than the science of it, as claimed by its official protagonists. Perspectives in political economy challenge the discipline of economics as well as nature of capitalist development to make it compatible with a democratic aspirations of the society. I spend a little while on the recent history of capitalism before I come to India.

### 1930 Depression and Macroeconomic Management of Capitalism

The global capitalist development has completed a full circle in past one hundred years, in terms of a long term boom integrating continents, deep depressions and recession, recovery and growth and crisis. Capitalist development was initially led by Great Britain and its European partners, advocating idea of free trade for half a century during 1830-1930. It was backed by the Gold Standard as the settlement mechanism the under national currencies, before it was met with a catastrophic end, resulting in the two world wars, which were directly the consequences of the contradictions of the Gold Standard system and the capitalist system under imperial colonialism [Karl Polanyi (1944)]. The Great Depression of 1930 has exposed the demand side vulnerabilities of the capitalist system that almost devastated the capitalism, before Keynesian economics rescued it. For the next two decades, after the War, the state intervention to save and manage capitalism as well as liberal bourgeois democracies has become the accepted feature of liberal state towards during 1940-70.

Coming to the post-colonial context, the formation of USSR and its quick success to usher in a rapid industrialization and the success of Keynesian economics in stabilizing Western capitalism had made state to emerge as 'development state' as much as a 'welfare state' as a natural agent of economic development in post-colonial world. Planned economic development is preferred to anarchic free markets. The countries, where bourgeois transformation had occurred, like India, South Korea, Brazil etc, had embarked on national development, based on simple strategies of increased savings and investment rates and accessing capital from the developed world. They tried to industrialise without waiting for private evolution of capital, with the help of public sector. However, their dependence on developed world for finance, technology, and capital goods remained a constraint to their growth and development potential, for what is extracted from them in return Sukhamoy Chakravarty (1987)]. They faced severe structural constraints such as agrarian, internal & external resources, capital good constraints, while solving different countries had different degrees of success. For this, they had to defy the neoclassical economic doctrines and diktaks of the international financial agencies. Many remained primary goods exporting countries. The Cold War politics also constrained free flow of global finance, while select countries were accommodated in the Western capitalist sphere. India at least emerged as much more industrialised country with a reasonable production base and potential. The post-Marshall plan period in the developed world has faced with the problem of long recession and stagflation, following the two oil shocks and increased competition between firms within developed countries, which frustrated the capitalist establishment. The Keynesian policies were blamed for taxing the entrepreneurship and neoliberalism sought to reverse every Keynesian policy. It was largely hated for the increase in wages and high tax rates, argued to be Keynesian legacy, which is not entirely true. US abandoned Keynesian international payment systems, to Dollar as the international currency, under flexible exchange rate system [Vourafakis (2012)]. It is also a fact the Keynesian solution is only an intermediate solution for the long term nature of capitalist crisis of realization of profits. Such a crisis worsens when economic growth slows down, hence resistance to Keynesian solutions gets harder. The fall of Soviet Union has also contributed towards depriving the developing countries any alternative strategy. Developing countries had to fall in line before the expanse of global financial capital, operating through multiple agencies such as IMF, World Bank, WTO, investment banks and so on.

The crisis of falling rates of profit of 1970s in US, the hegemonic power, is met with a three-pronged strategy, namely, financialization, neoliberalization and globalization, at home and abroad [Leo Patitch (2002)]. It has also forced the Europe, led by Britain under Margaret Thatcher, to fall in line. The fall of Soviet Union also forced poor countries to succumb to the unipolar US hegemony and adopt to the new economic strategy under global finance capital direction. For the US and its allies, this has given a lease of life to get out of recession of 1990s, global economy rode on cheap labour of the newly industrialized countries and financial markets during 2001-09. However, the whole growth story rode on the information technology revolution that advanced every other field of production and service. To counter the working class power, capital is shifted to low wage regions in Asia. China and South Korea and India to some extent became the beneficiaries of this global restructuring. Probably China's rise to dominance by moving from periphery to centre of the periphery in the World System has now made US clueless, as being the financial power and finance led economy proved to be dangerous sites of speculative economy. The turn to protectionism by Trump administration reflects this chaos is a reflection of this crisis. As financial experts like Raghuram Rajan have cautioned, despite not having any apocalyptic crisis, the global

economy has become an unstable and uncertain terrain conducive for ruination, if it is unchecked and not regulated. India's journey and political economy of its development has to be viewed in this historical exteriority.

### **India's political economy of development**

The economic history of Indian subcontinent has to be put in perspective, so that we have a civilizational understanding of our economy. The Indian subcontinent had enjoyed its advantages for being a tropical region that can produce what cold regions could not. Hence, had a comparative advantage in far more commodities growth in India and China. The medieval feudal empires brought global innovations that had benefitted artisanal production. Therefore, Indian subcontinent was on forefront of global exports for centuries during 1350-1750. India enjoyed copious inflows of silver in exchange of handicrafts, spices and so on [Baily (2011)]. Mughals smartly adopted silver as currency, which served the dual purpose of currency as well as silverware. Thus, there is phase of economic boom Indian subcontinent enjoyed from trade with Europe and Middle East, including the trade with East India Company. But the ushering of Industrial revolution produced mixed prospects for India and turned the tables. Even though the economic drain from India funded the British prosperity, but the British investments in India during 1870-90 began benefitting selected sectors and Indian trading class in modern textile mills, jute mills, paper mills, match factories, tanneries, iron and steel, cement and coal etc, began emerging. And subsequently, the interwar period led to a considerable transformation of Indian trading class into manufacturing class [Bagchi, Amiya (1984)]. While British taxation systems had crippled the peasantry, it had contributed to growth of usurious informal finance and trading classes. But the agrarian transformation into commercial mode of production is completed by this era, which is an important process to produce market surplus for the modern sector. Hence, India like China had begun its post-colonial era on far more better footing than African and other Asian counterparts. The growth story under colonial regime is far more mixed than a simple case of exploitation [Thirthanker Roy (2005)].

### **India's Industrial Growth and Manufacturing Imbrolio**

As mentioned earlier, the Indian manufacturing class was considerably developed at turn of Independence and enjoyed tremendous support from the state during the planning period, in terms of protection from trade, cheap infrastructure, provision of free land, preferential allocation of foreign exchange for imports and cheap bank credit. The Bombay Plan provided by the Indian industrial class provided the consensus that state to provide vital infrastructure, heavy industries and core inputs, besides social capital, while private sector would enjoy the protective space in consumer durables. Raising the savings rate and capital accumulation is taken as the basic framework of the growth strategy with planning as tool. After an initial growth led by investment, soon industrialization hit a severe recession, exposing some chief limitations in the model. Unable to raise adequate tax resources, underestimating execution problems, and excess capacities in key industries gave important clues on supply and demand side problems. Fighting the twin-deficit constraint, Indian development experiment proved a mixed bag in terms of its success. The inability to understand the importance of export-orientation, lack of vertical integration, inflationary barriers in wage goods, etc proved costly. The small enterprises were starved of working capital, while big business cornered loanable funds. Protected markets did not compel Indian industrialists to be externally competitive [Vivek Chibber 2005]. The large domestic market ensured high profits for the risk-averse domestic capital. India also did not avail historical opportunities to increase its global footprint, while trade controls like Multi-Fiber Agreement did not provide a level playing field to all countries in the world. The result is that Indian industry remained slow in its growth with a low average of 7 percent growth *vis-a-vis* East Asian counterparts grew at 11-14 percent. Indeed, it grew at a modest rate of 4 percent for most of the period during 1970-85, only accelerated during 1985-90 to 7 plus rate, after partial liberalization and huge fiscal support, before the economy hit another shock in terms of 1991 economic reforms.

Public sector was designed with consensual view to overcome key developmental problems of underinvestment in infrastructure by the private sector, indivisibilities, merit-public-and-strategic goods issues [Yoginder Alagh (1991) ]. It is the public sector that provided decent work conditions, minimum wages and respectable salaries that sustained the market demand for consumer durable production. However, public enterprises were deliberately underpriced, denied profitable areas operation and were forced to takeover loss-making private

enterprises [R Nagaraj (2005)]. Nevertheless they played a critical complimentary role. However, once the neoliberal shift occurred, public sector is systematically and selectively targeted for inefficiency and being burden on the people.

Indian industry remained largely exclusive preserve of limited family owned companies, and it defined the limits of its growth. The family based organization structure, though provided the institutional stability, but largely remained constrained in terms of raising the technological innovation. The zeal in accessing the corridors of power for monopoly statuses and cheap natural resources is not matched in becoming competitive, largely due to demobilization of labour by the state and monopolistic structure under protection. This was also largely due to the trade with the Russian block for over thirty years provided stable markets for industrial consumer products, maintained at a stable exchange rate with Ruble, made the industry complacent towards becoming globally competitive. The fall of Soviet Union and the disappearance of Eastern Bloc trade forced them to accept the neoliberal hegemony of the global finance [Vivek Chibber (2005)]

The post-reforms industrialization strategy by and large has been to fall in line with WTO mandate, open up the economy for the foreign direct investment by deregulation and depreciation of currency. Indian industry quickly adapted by entering with collaborations, offering production facilities and marketing networks, while a large segment of small and medium scale industry got wiped out. New areas of private corporate capital have emerged such as pharma, infrastructure, aviation, transport, banking, education, hospitals, and telecom, while information technology and business process outsourcing provided the employment and foreign exchange earnings for the changing structure [R Nagaraj (2005), Harish Damodaran (2012)]. The state kept a pro-business strategy to keep the strategic ties with the industrial capital, thereby did not promote any genuinely competitive industry either. However, with the help of rising global demand and an overexpansion of bank credit, a growth boom was created during 2004-09. This has helped to receive more FDI and get out of problem of foreign reserves, no matter how much depreciation is allowed on a continuous manner. The consolation is that it has not yielded to the finance capital's demand to liberalize capital account, thereby prevented 1997 East-Asian type currency crisis. But is a fact that the so-called reforms have failed to make Indian industry to grow a robust enough sector to survive a global competition.

Moreover, in spite of larger corporate sector's growth, the employment share in organized manufacturing has declined. The share of contractual employment within manufacturing sector increased to 60 percent, making quality of employment even worse. The non-labour intensive segment of manufacturing has grown faster than the labour-intensive segments making employment a casualty in the industrial growth process in India. The systematic marginalization of small scale industries by the banking industry and preference to lend to the big borrowers becomes the compulsion for the banks who are desperately reducing their transaction costs and increase bank profitability. The dominance of the big capital is re-established during the post-reform period with vengeance [Bhalla (2009)].

### **Post-Independent Agrarian Transformation**

It is extensively debated whether Indian agriculture had adequate transformation by turn of the Independence. While it is sufficiently commercialized, the Indian agriculture suffered from considerable backwardness in terms of productivity and technology and also considerable 'built-in depressors' in the words of Daniel Thorner. In spite of a lack of consensus, political economists have used variety of conceptual categories to expose the depressors, like interlocked markets [(Bharardwaj (1974), Bhaduri (1976), falling terms of trade [Lipton (1974), Kahlon and Tyagi (1984), Rudra (1974), Patnaik (1984), Banaji (1976), Alavi (1978) etc], all of them pointing out at lack of free operation of credit, output and labour markets which were expropriating the surplus from the actual producers. The abolition of Intermediaries was perhaps the only and the most successful agrarian reform that Indian state had undertaken to abolish large part of semi-feudal relations by transferring ownership rights to the middle peasants, while land ceilings and redistributions remained colossal failures. Lipton explained best about the lack of capitalist means to implement land redistribution as happened in Korea and Taiwan under Marshall Plan where markets prices were given to the landlords to give up surplus holdings.



However, the technological improvement in fine cereals, support prices for the major cash and food crops, extension of rural bank credit, subsidized modern inputs, extension of canal and ground water irrigation have led to the gradual improvements in raising the marketed surplus of various crops. Indian agriculture improved its long term average growth from -0.01 percent during 1900-49 to 2.7 percent during 1950-2000. The food grains production had increased from 80 million tons in 1961 to 280 million tons in 2016. There are largely two phases in the last 70 years, first, period between 1966-91 received massive public investment in irrigation, fertilizer and power subsidies, technology and price support. The second is the post-1991 reform saw a reversal of this support. The private investments had to replace public investment, eventually began affecting the profitability. Besides, the production which is based on semi-scientific technological means, environmentally unsustainable methods, has nevertheless raised the agricultural surplus for the modern sector. The unstable production and unviable production has benefitted the traders more and farmers less, largely owing to the nature of petty commodity production. The neoliberal era has seen progressive withdrawal of state in terms of subsidies, under coverage of credit, import liberalization in select categories, privatizing seed companies, allowing MNCs, encouraging contract farming and supply chains. While transition towards capitalist relations are beyond doubt, the million dollar question is whether this new model of free market based model transform the agrarian sector, without destroying the small peasant?

As Bernstein (2010) argued that the agrarian question is no longer resolved by the national capitalist development process, as initiated by the Indian state. It was done in the interest of the industry which was to receive cheap foodgrains and financial surplus. Now modern industry during globalization has access to global finance, hence no longer any active transformation is continued. It is now left for global supply chains and agribusiness to access the agriculture, in what way it will transform small peasant involved agriculture is going to be different. We need to understand the process from a post-globalization perspective.

Abandoned by the state, the smaller peasantry will increasingly face the problem of viability, given the particular vulnerabilities arising from the nature of the production in the sector, without getting absorbed in the manufacturing or service sector is going to be peculiar post-colonial condition. As long as surplus labour exists in agriculture, the productivity changes are unlikely to increase much within the existing structure. Social spending in terms of employment guarantee, or microcredit or direct money transfer or basic income transfer may sustain the low equilibrium economy for medium term, but the long term improvements need a sustained capital formation. The organization changes in terms of formation of cooperatives can increase the access to institutional finance for the necessary improvements in the productivity, but is a Herculean challenge to achieve it.

The falling employment, lack of remunerative prices, stagnation of yields, fall in soil quality, excess use of groundwater, increasing environmental stress, untimely rains and delays in monsoons, indiscriminate use of inorganic inputs, excess use of groundwater, pernicious rise in pesticide residues in food are some of the problems which can be tackled only with changing the organizational structure of India agriculture. Indian state so far did the balancing act of protecting the peasantry from large scale primitive accumulation by capital by undertaking displacement strategies so far, but the future appears to be worrisome. The million dollar question is that who would reorganize the petty commodity producers in India into cooperatives, do they succumb to corporatization of agriculture. The speculative investments in agricultural lands which reflects in overvalued land prices is another obstacle for any of these two kinds of change that the sector needs to undergo. The rural poverty, unemployment, low nutrition, and backwardness is likely to be general features of Indian agriculture.

The allied sectors such as livestock, fisheries, aquaculture, and diary are sectors which receive rising demand in the economy, while the supplies are extremely slow. The poultry industry has registered impressive growth in the past forty years, almost exceeding the domestic demand. The exports are constrained by the safety standards. The low per capita egg and meat consumption in the country even today suggests the future potential of the home market, however, this needs rise in the rural per capita income. The mutton production, the only alternative meat in the presence of ban on the beef consumption, is also organized by the caste occupations and has yet move to more scientific methods of production. All these await an opportunity of growth.

### **What did the Neoliberal Reforms do to the Economy?**

The popular discourse produced by the business media, government and protagonist of reforms that India that after 1991, Indian economy has embarked on a new growth trajectory of 7 plus rate of growth [Panagariya (2009), Rangarajan (2007), Ahluwalia (2004)], which is the best half-truth which is ever produced. Indian economic growth had already accelerated beyond the Plan target of 5 percent during mid-1980s itself and indeed reached 5.8 percent. These are largely after removing several structural constraints such as foodgrain constraint, power & instructural constraint, working on foreign exchange constraint (partly through borrowing and partly through remittances) and easing the demand constraint through active fiscal policy, besides the supply side reforms. In fact, it is now well recognized that for more than a decade during 1991-2003, economic growth rate in fact marginally shrunk to 5.6 percent. There was no statistically significant break in the long term economic growth produced by the neoliberal reforms. What happened however, government sector is effectively reduced and rise of private corporate sector, in terms of the production regime, which has made the distribution of income more and more skewed towards the rich and powerful.

By reducing the interest rates, savers are forced to invest in mutual funds and NBFCs, whose governance remained poor. With the opening of equity markets and real estate markets and reducing capital gains taxes, India received huge amount of amount of short term capital and hedge funds. Indian Finance Ministry began aiming policy announcements to boost the equity markets on a regular basis such as tax incentives, public sector disinvestment and other policy instruments. The equity markets began sites of excessive speculation, robbing several small investors, and totally delinked to the real economy. This is another mechanism to siphon off money from small savers. While the stated justification given for encouraging these speculative markets is that these would bring much needed foreign exchange reserves and encourage risk taking behavior among entrepreneurs, the end result is the extreme skewed income distribution that results in the process.

What is worse is the fact that the public sector banks have been used by the big capital, using the politicians to influence the banks to lend by bending all the rules. The result is, unsurprisingly, the huge building up of the Non-Performing Assets, a technical term for bad loans. The banks had flouted every norm to expand credit to the big borrowers for infrastructural projects, often through NBFCs such as IFSL. It is now widely believed that when the IFSL scam fully blows out, it is likely to create a major financial crisis in India with long term ramifications.

### **Labour and Employment**

However, an important point regarding the structure of the economy is concerned is that despite lack of adequate possibilities to influence a transformation in the occupational structure of labour force, it is fact that the amount of transformation that took place during 1991-2011, where 16 percent of labour force could come of out agriculture, while for first 4 decades during 1951-91, only 12 percent moved out [Deepak Behera & RVRamana Murthy (2014)]. India's agrarian labour force is brought down to 46 percent from 72 percent in 1961. While China could bring it 20 percent, India still struggles, in fact, the rate of transformation that had improved in its past, has also slowed down 2011 onwards. Again, much of the migrated labour is absorbed only into the informal sectors, including construction.

### **Inflation Management**

The Indian state has managed moderate inflation rates for four decades of its planning period. It is recognized that given the deep structural constraints, certain inflation is inevitable to the economy. Given the food and non-food price spiral on one hand and wage & product price spiral on the other, 6-7 percent of inflation is accepted by the Sukhamoy Chakravarty Committee during 1987. Often this inflation target is overshoot, largely owing to foodgrain inflation. However, in the post-reform period, a norm of 4 percent is fixed as target and monetary policy is given singular policy objective to strictly achieve inflation targeting. The fiscal policy is used for deflationary objective and while selective relief being given during the Global Financial Crisis in 2009. The conservative monetary policy is applied to the hilt, finally achieving the goal of pushing the inflation below the

socalled core-inflation. The headline inflation since 2016 has fallen below the core inflation. This is primarily made through suppressing the agricultural prices, which has resulted in spreading of agrarian crisis to new areas in the country and the farmers' crisis. The idea of keeping low inflation comes from the Classical and New Classical macroeconomics that inflation reduces the real rate of interest, increases inflationary expectations, fiscal policy ineffectiveness and classical dichotomy. All these ideas, besides being having no empirical evidence, makes state to lose all its levers to fine tune the economy at a minimum cost. Despite the fact that 'developmental state' in poor country has greater role than macroeconomic stabilization, the mainstream economic theory has debunked both development theory as well as the Keynesian macroeconomic theory. This has pushed the economy back to the pre-War II vulnerabilities of unemployment as a price of low inflation.

### **High Growth Phase and Current Decline**

The average long term economic growth of Indian economy has progressed from 3.5 percent during 1950-80 to 5.5 percent during 1981-91, continued at that rate during 1991-2003 and accelerated to 9 percent during 2004-09. Since then it declined to less than 5 percent before the methodology of GDP estimation is changed in such a way that neither a comparison is any more possible nor trust the data for current time, as said by no less a person who acted as the Chief Economic Advisor to the present government. Currently the economic growth is poised to come down to 5 percent, while the real figure feared to be between 3-4 percent. There are several types of diagnoses that have come up so far. One such thing is whether crisis is structural or cyclical? Cyclicity informs that business cycles make upswings and downswings are inevitable, hence at some point downward cycle will end. If there is structural crisis, then it would secularly affect the economy, until the structural constraints are removed. The structural factors, besides constraints could be competition, declining profitability, falling productivity, X-inefficiency, lack of exports, excessive import dependence, narrow demand base, etc. Thirdly, there could be structural and cyclical factors working together. Whether private capital would solve all these questions, or it requires an active interventionist state or simple but strict regulatory state is matter of core beliefs of the hegemonic paradigm.

Within the bourgeois framework, we have heard several positions. Prof Ratin Roy of NIPFP, opined that there is a structural crisis resulting from a narrow demand base is the root cause that caught India in a middle-income trap, which needs a gradual redistribution. Dr Manmohan Singh says capitalists have developed fear over excessive tax surveillance, hence panic reactions of the ruling dispensation created a confusion. Prof Govind Rao blamed faulty GST and demonetization. Dr Arvind Subramanian said a serious structural crisis in terms of over exposure of bank & non-bank credit, drastic decline in profitability, hence not only the government but real & financial institutions are suffering from balance sheet deficits worsened by falling growth rate, what he calls as twin-balance sheet problem. He has reversed the Pickety's logic of growth rate falling below interest rates to say a major financial crisis awaits the future. Dr Subramanian also cautions to set right the methodology of national income estimations to that the allegations of overestimations are settled. Neoliberal solutions are the usual recipe of further labour reforms, more tax cuts and the balanced exchange rate. However, nothing much of these is still left, except banking and petroleum industries. It is now umpteenth time proved that when serious structural and demand side issues plague the economy, supply side reforms have no impact. In adequate understanding, social and political upheavals and natural catastrophes can all interfere and stall the growth process as seen in the history. Therefore, what all have the different scholars and experts have a grain of truth.

It is also a well acknowledged fact that the mess that is created by the demonetization, an ill-planned and ill-executed Goods and Service Tax (GST), contractionary fiscal policy, conservative monetary policy, ill-advised tax incentives to corporate, have slowed down the economy as well as left it in the doldrums. The high growth that was built on reckless lending by flouting all banking norms has left such damage, that it now needs some strong measures such as liquidation of the assets and taxing the rich. The present ruling dispensation has neither the guts nor the appetite for such brave move. It is trying all kinds of political subterfuges to divert the national attention, but how far?

An important point in capitalist management is that growth itself does not guarantee against the instability of the system and the realization crisis. When reckless lending is resorted to produce a growth bubble, then the destruction of book values of the wealth will follow in the downturn, giving a long term shock to the real economy, since it paralyses the financial system. The toxic assets do not simply transfer money from one hand to the other, but it will affect the values of even the healthy assets. The downward correction can cut across the feet of genuine and real sectors. Indian crisis stands at these crossroads, where a Keynesian solution of state intervention is not allowed by the external financial architecture nor the internal mess can be cleaned up created by the capitalists-politician complex.

### The Challenges

There are several challenges that Indian society is facing. I am going to talk about few short and medium term challenges regarding its political economy. I will conclude by taking a minimalist position on what can be done for its relevant future to alleviate the political economy.

India's, like any other country', especially a post-colonial peripheral capitalist country has rein in its capitalist development towards more human and social development. Only then the society will benefit from the growth potential of capitalism as well as preserve itself from the ills of capitalism. This is what European nations tended to do and China has done it to a large extent. There at least five challenges that India should meet.

First, India should straighten its definitions of taxable income from business, abolish various exemptions, and raise its effective tax revenues to at least 25 to 30 percent of GDP. Second, it should focus on raising the investment credit to SMES & MSMEs, so that employment and income generation in the modern sector takes place. These sectors require several supply side institutional measures. This would reverse the income inequality in the country and improve aggregate demand for the industry as whole. Third, India must increase social development investments, re-invigorate public higher education, public health and promote innovation in public sector. Fourth, it must take slew of measures on agriculture, ranging from organizing cooperatives, boosting the allied sectors, to promote land augmenting and ecology conserving measures, besides making sure that farm prices earn reasonable profit over the actual cost. They should discourage real estate and speculative holdings in agricultural lands. Agriculture awaits a genuine sustainable second green revolution that would raise productivity and as well as incomes of the people in the sector, despite the challenges. The political question of agrarian change needs to be taken up now. Fifth, there is a need to step up aggregate demand and Keynesian instruments should be revived and enough resolve should be shown the international finance and investors that the country would not get cowed down by the external pressures. India should find strategic export opportunities and promote such exports assiduously. The national reserves at central banks and SEBI etc should be judiciously used to clean the banks and preclude political interference. The quality of infrastructure is extremely poor, may it be roads, railways, ports and urban public transport systems. Government should use non-banking financial companies to raise long term resources to improve infrastructure. This is tried and tested instrument.

Unless some drastic reforms, not the market reforms that corporate sector and global finance is pushing that offers hope for a sustainable growth for India. The politics for that political economy needs to be evolved and nurtured.

Jai Hind!

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## V. ABSTRACTS OF PAPERS OF RESEARCH COMMITTEES

### 01. AGRICULTURAL SCIENCE

**0501036 CHANDANA, G.S AND C.P. GRACY (Department of Agricultural marketing, Co-operation and Business Management University of Agricultural Sciences; GKVK, Bangalore-560065). 3 SUSTAINABLE GROWTH RATE) AND SUSTAINABLE GROWTH CHALLENGE OF KARNATAKA CO-OPERATIVE OILSEEDS GROWERS' FEDERATION LIMITED**

Groundnut is grown on a large scale in almost all the tropical and subtropical countries of the world. India accounts for 4.89 mha area and 9.25 mt production which is about 20 per cent of world area and 28 per cent of world production. Among the Indian states, Karnataka is in fifth position with 0.564 mha area and 0.553 mt production. In order to encourage groundnut farmers in Karnataka the Karnataka Co-operative Oilseeds Growers' Federation (KOF) limited during 1984. This study was initiated to examine the financial performance of KOF for the period of ten years from 2008 to 2017. The Analytical tools used for the analysis are Sustainable Growth Rate (SGR) and Sustainable Growth Challenge (SGC). The sustainable growth rate is a financial system of measurement used by different business enterprises to address potential growth problems. The sustainable growth rate computation comprises of four levers contributing to cooperative performance. The earnings retention is the first lever which is most important driver of sustainable growth. If additional earnings are retained, that provides capital to fund growth and likewise, distribution of the earnings to members in the form of cash reduces available capital for this purpose. Leverage reflects the capital structure of the federation and is controlled by the board of directors. Growth can be enhanced by adding more debt capital which can boost the SGR. Profit margin is key to any cooperative's performance and critical to calculating a SGR. Operating efficiency is the last piece of the SGR equation. This particular "lever" shows how efficiently a cooperative's assets are being utilized to generate sales. So, if a cooperative decides to expand assets, then sales need to rise significantly in order for there to be contributing to enhanced operating efficiencies and a higher SGR. The SGR ranged between minus two to 16.6 per cent for the period 2010 and 2017. Sustainable Growth Challenge (SGC) measures the challenges to achieve SGR. The negative SGC during 2009 and 2014 reveals that the federation depended on borrowings rather than on its sales growth. Significant competition limits the ability to lift profit margins to derive growth, profitability must occur or else growth will be negative. Positive growth in SGR shows that the cooperatives have the ability to earn and retain more profit. It is straight forward way to analyze growth and it find ways to ensure the cooperative's capital is being used in a way to create value.

When the SGR is compared to actual sales growth, the sustainable growth challenge (SGC) can be identified. The SGC is the difference between actual sales and SGR. If a business has a positive SGC, then actual growth rates exceeded SGR, which means outside financing is necessary to fund growth. Between 2010 and 2017, the SGR ranged between -2 to 16.6 per cent. The negative SGC during 2009 through 2014 period reveals that the federation depended on external borrowings rather than on its sales growth and the growth rates exceeds SGR.

**Keywords: Sustainable Growth Rate (SGR), Sustainable Growth Challenge (SGC), Groundnut, KOF**

**0501037 CHAUDHARY, RAJINDER (Department of Economics, MD University, Rohtak, Haryana). ORGANIC FARMING: DIFFERENT PARADIGMS REQUIRE DIFFERENT VALIDATION PROTOCOLS**

Review of latest reports and policy documents of 'Network Project on Organic Farming' running since 2004 at ICAR - Indian Institute of Farming Systems Research, Modipuram (UP, India) shows that in spite of results clearly favouring organic farming, policy recommendations do not propose its mainstreaming. Moreover, this reluctance is unexplained. Organic farming is not just a negation of chemicalization of farming with a singular set of practices, as has been presumed in this project, but, at least some forms of organic farming, represent a different

paradigm all together. Inter-linkage of different agronomic practices of (self-reliant) organic farming is underlined and a case is made out for taking a comprehensive and integrated view of organic farming in comparative trials. This in turn calls for different and system-wide validation protocols that also take into account diversity of organic methods rather than usual single variable controlled trials.

**Keywords: Organic Farming, Self-reliant Organic Farming, Low External Input Organic Farming, Validation, Paradigm, Indian Institute of Farming Systems Research.**

**0501038 DEL, SAILABALA AND SINHA, A.K. (Bihar Agricultural University, Sabour, Bhagalpur).  
PERFORMANCE OF LENTIL CROP UNDER CFLD - PROGRAMME IN ARARIA DISTRICT  
OF BIHAR STATE**

Lentil is one of the major pulse crops in Bihar, constituting around 30% of the area under cultivation of pulse in the state. But the average productivity of lentil is less than 10q/ha against a potential yield of more than 15 q/ha, which is yet to be achieved to face the challenges of nutritional security for the mass. In order to enhance the production & productivity in pulses, the CFLD-programme (Cluster FLD) has been recently started by the Govt. of India in the country across the states, in which lentil is also the mandatory crop for lentil growing areas. The present study is an attempt to analyse the performance of HYV- lentil and bio-fertilizer under CFLD- programme in terms of productivity, area expansion and income generation among selected farmers of Araria district in Bihar State. The study revealed that the CFLD intervention with lentil variety HUL-57 and Rhizobium bio-fertilizer could enhance the productivity to an average level of 12.80 q/ha against the traditional varietal yield of 10.01 q/ha, thereby giving a yield increase of 28% in the district.

This increase in yield was contributed by 87.10% through HYV-seed & 12.9% through bio-fertilizer separately, giving rise to the net return of Rs 51,828 /- per ha and B:C of 3.86 at the farmers fields, reflecting that the intervention is a successful step towards "doubling of farmers income" and "nutritional security" in the district. Ultimately, this programme has led to an area expansion approximately 5% within a short span of two years in the district.

**0501039 DEL, SAILABALA AND SINHA, A.K. (Bihar Agricultural University, Sabour, Bhagalpur).  
PERFORMANCE OF POTATO VARIETY KUFRI KHYATI UNDER CHANGING CLIMATE  
OF ARARIA DISTRICT IN BIHAR STATE**

Potato cultivation has been gaining importance during recent years among the farmers of Araria District of Bihar state due to climatic change affecting traditional cropping pattern and lower yields thereof. In order to provide a short duration and secure crop in the sandy loam soil condition (69.9%), different potato varieties have been evaluated with regards to the maturity duration and yield so that the existing cauliflower-potato-mung bean based cropping system could provide a remunerative potato crop to the farmers of the district. The study revealed that the HYV-potato, i.e., Kufri Khyati is a far superior variety than the existing variety K. Pukhraj, yielding to the tune of 425q/ha with a net return of Rs.2.00lakhs and B:C ratio of 6:1. The variety is now quickly spreading and being cultivated in 5000 hectares of land within a short span of two years. Apart from being short duration, this variety is also having least disease/pest incidences and high yielding characters and therefore quickly replacing Kufri Pukhraj (high disease/pest incidence) and is being cultivated as a major cash crop in the district. The details would be presented.

**0501040 DEVI, LATHA G; NIKETHA L; M A KATAKTALWARE AND P ADHIGURU (ICAR-NIANP,  
Bengaluru-560030)-TECHNOLOGY, AGRARIAN STRUCTURE AND AGRICULTURAL  
TRANSFORMATION: KEY PROBLEMS AND PROSPECTS**

Technology and productivity focused agricultural strategies in post-independence India have experienced measured success in selected pockets in India as revealed by several studies. Their consequences for employment and livelihoods have been mixed. Overall, such strategies have not been sustainable in ecological and yield terms, and have not displayed the potential to be transferred to other regions due to problems of agrarian power and social



structure, inappropriate R&D and extension, and differences in factor endowments. Critics from an environmental perspective have pointed to the severe consequences of green revolution techniques for soil degradation, water depletion and water conflicts, genetic loss, health effects, and ecosystem problems. Gains for labour and employment were limited and adverse for women agricultural workers. Problems of scale neutrality expanded gaps between peasants and farmers with different land holdings. The green revolution being the single largest source of rapid technological transformation in agriculture, studies yielded many insights into the relationship between agrarian power and technology adoption. While certain sections of entrepreneurial peasants adopted such technologies on a large scale, initial optimism about large-scale technological transformation of Indian agriculture was belied. This applies whether one looks at conventional technologies or those that are more sustainable, appropriate, and beneficial to small peasants in dry-land agriculture.

It is clear that the existing agrarian structure, enmeshed in deeply hierarchical caste and class inequalities and exploitation, strongly resists change. Technologies, even unsustainable ones—can be disruptive, and the rural dominant class would promote change only on its own terms. The expansion of non-farm employment in rural areas puts further pressure to open up agrarian labour markets, but studies are again inconclusive on the long term dynamics of this change, on the nature of non-farm employment, its actual potential to usher in change, and on the reasons for fluctuations in employment potential of this sector (Thomas 2012 and 2014). Political changes are pushing dependent lower castes to seek labour outside of their regions putting further pressure on the labour market, creating labour shortages, but unable to force more favourable conditions for rural labour. On the whole these processes create a situation of flux which require further research, and which complicates the process of strategizing and policy-making for employment generation in agriculture. The large-scale fluctuations in women's employment is especially to be noted, and needs explanation (Thomas 2012). Given the feminization of agriculture and rural poverty, the gender dynamics of the labour market and of households are fundamental to any strategy for poverty reduction and women's empowerment, as well as the success of agricultural transformation initiatives.

In addition, gender dynamics and feminization of agriculture also have implications for technology adoption, and the choice of techniques for enhancing productivity and income. Critics of agricultural biotechnology and genetic engineering have tended to suggest that such strategies would disempower farmers and peasants by making them dependent on corporate seed companies, would have deep ecological consequences affecting already fragile agricultural systems, make them passive recipients of inappropriate technologies, and would especially affect women who have traditionally played an important role in the genetic perpetuation and experimentation of crop varieties. Constant learning and innovation are of crucial importance for farmers in developing countries. Women in farm households produce food and other commodities, but also develop knowledge and technology with reference to improving, storing and exchanging seed, and conserving and managing natural resources.

**0501041 DHANUSH, S. K. AND MURTHY, M. MAHADEVA (Department of Forestry and Environmental Science, College of Agriculture, University of Agricultural Sciences, GKVK, Bengaluru-560065). ASSESSMENT OF CARBON SEQUESTRATION POTENTIAL OF STANDING TREE BORNE OILSEED SPECIES IN GKVK CAMPUS, BENGALURU, INDIA**

In order to fight the ever-increasing pressure on forest and to reduce the CO<sub>2</sub> levels in atmosphere, cultivating trees on arable lands has become necessary. In this context, a field experiment was carried out in UAS, GKVK, Bengaluru to study the growth performance and amount of carbon sequestered by tree borne oilseed species. The experiment was laid out in Randomised Complete Block Design with seven treatments i.e., tree species (Simarouba glauca, Melia dubia, Azadirachta indica, Melia azedarach, Pongamia pinnata, Madhuca latifolia and Calophyllum inophyllum) and replicated three times. Biomass was calculated using Non-destructive allometric models. Based on the performance of growth and yield trait analysis, Melia dubia recorded significantly higher tree height (12.72 m), DBH (38.61 cm), wood volume (0.848 m<sup>3</sup>) and canopy spread (14.78 m in N-S and 11.91 m in S-W direction) as against other tree species. Melia dubia was able to sequester 268.4 tonnes of CO<sub>2</sub> followed by Simarouba glauca which sequestered 162.5 tonnes of CO<sub>2</sub> and Pongamia pinnata which captured 150.5 tonnes of CO<sub>2</sub>. This indicated that, Melia dubia, Simarouba glauca and Pongamia pinnata were highly promising tree species for carbon sequestration over other tree species.

**Keywords: Carbon Sequestration, Tree Borne Oilseed Species, Non-destructive allometric models**

**0501042 HALDER, SOUMIK AND SAYANI, MUKHOPADHYAY (V.I.P. Stores Lane, Nischintapur, PO-Rampurhat, Dist- Birbhum, State- West Bengal, Pin- 731224)-IMPORTANCE OF MGNREGA TO REDUCE OCCUPATIONAL CRISIS DURING AGRICULTURAL MECHANIZATION**

Agricultural labourers are facing tremendous challenges in recent time due to increasing implantation of machineries in agriculture by the wealthy farmers in response to reduce cultivation cost and labour oriented problems. The objectives of this study are to estimate the occupational loss in this block due to agricultural mechanization and to find out the importance of MGNREGA on livelihood development in rural areas in the transitional phase of agricultural mechanization, special reference to Rampurhat I Block of Birbhum district of West Bengal. It is an empirical study based on primary and secondary data. Questionnaire and Focus Group Discussion (FGD) techniques have been taken to conduct the field survey. In this block about 80 percent of Gross Cropped Area is cultivated by paddy and wheat. The big farmers, who were hiring agricultural labourers, are now hiring machineries to maximize the profit which is imposing huge unemployment pressure on rural workers who are highly depending on agriculture, mainly on marginal farmers and agricultural labourers. It becomes a serious challenge in recent time to the poor cultivators and agricultural labourers to secure their livelihood status. So, an influx of occupational shift from agriculture to non agricultural activities has been found and in most of the cases mixed occupational characteristic has been observed in this study area. Mahatma Gandhi National Rural Employment Guarantee Act is most ambitious and world largest social security programme running in the rural areas since 2006.

This study manifests that MGNREGA has directly and indirectly increased the livelihood options among the rural destitute agricultural labourers and marginal farmers. It has been playing significant role in work participation of women and reduced the possibility of distress migration by generating substitute source of income.

**Key Words: MGNREGA, Agriculture, Mechanization, Occupational Shift, Livelihood.**

**0501043 KANWAR, M S AND NAMGYAL, D (Krishi Vigyan Kendra (SKUAST-K), Nyoma, Ladakh). TRENCH TECHNOLOGY: A PROFITABLE PROTECTED STRUCTURE FOR SUMMER SQUASH CULTIVATION IN COLD DESERTS OF INDIA**

The Greater Ladakh is the high altitude Trans Himalayan region of India. The area is sandwiched between Himalayas in its south and the Karakoram ranges in the north. The major portion of Indian cold arid (68321 sq Km out of total 74809 sq Km) constitutes Ladakh. Such a geographical setting manifests itself into some peculiar agro-climatic conditions that prevail in High Himalayas. Extreme cold and aridity coupled with large seasonal as well as diurnal variation in temperature are limiting factors affecting agricultural productivity adversely. Though food security in Ladakh is taken care of by an efficient PDS, nutritional and income insecurity are the principal concern for the policy makers. Fresh vegetables and fruit are always in short supply in the region. Only 5000 tonnes of fresh vegetables are produced locally during the growing season whereas demands of only the army stationed in Ladakh is around 13000 tonnes annually. Vegetable crops are care intensive and require proper upkeep and management so as to harvest their really vested potential. Harvesting more return from a unit area of land, disguised unemployment, improper availability of fruits and vegetables, malnutrition, generating employment and satiating needs of dominion population are major concern awaiting for strategic initiation and integration having bearing on hastening production and quality. The trench cultivation has proven its worth in realizing more output per unit of inputs and resources bestowed on to land as an alternative to raise production and productivity especially to meet out own requirements. Seeing the efficacy, there is need of harnessing and leveraging the potential of trench cultivation on commercial scale with variety of vegetables. Though, Summer squash (*Cucurbita pepo*) is not a major crop of Ladakh region and is grown on small scale during summers in Ladakh region, its early availability for consumption may attract the farmers. Although, it can grow in open field conditions in lower belts of Leh district but its real potential can be realized only under protected structures. The experiment was conducted during summer in trenches (Size 10 ft long x 6 ft wide x 1.5ft deep) at Vegetable Research Farm, Stakna (Leh) which is situated at 3319 m amsl with latitude 33 0 58.551' NS and longitude 77 0 41.995' EW. Climate of the area is typically dry temperate with extreme fluctuations in the temperature. Soil of the experimental field sandy loam. Design of the experiment was RBD with five genotypes and material was replicated 4 times. Data were recorded on 5 characters and subjected to statistical

analysis as per Snedcor and Cochran (1967). Comparison was done among varieties for their performance. Results revealed that variety All Green is highest yielder with highest fruit weight and no. Of marketable fruits. This technology comprising trench and summer squash var. All Green may be upscaled to similar climatic condition with high wind velocity to enhance farm income of the farmers.

**0501044 KIRAN, S.C AND MURTHY, M. MAHADEVA (Department of Forestry and Environmental Science, College of Agriculture, University of Agricultural Sciences, GKVK, Bengaluru-560065). FINANCIAL INCLUSION IN RURAL DEVELOPMENT**

Financial Inclusion is the process of ensuring access to appropriate financial products and services needed by all sections of the society at an affordable cost fairly and transparently. Five 'P's of Financial Inclusion are Product (suitability); Place (physical or electronic access or BCs); Price (reasonableness) ; Protection (Consumer Protection Code) and Profit (viability). With all this the data reveals that Less than 25% of adults are financially literate in South Asia (11.3% in India) and 41% did not apply for loans due to documentation formalities with 48% of 180 million bank accounts have no transactions and having 70% of Indian adult population don't understand basic financial concepts hence RBI introduced modules on basics of banking and finance as part of school curriculum and made concept of Self-Help Group Bank Linkage Programme (SHG-BLP) which is another landmark model to create sustainable livelihoods of rural population with all these studies revealed that the incomes of SHG members increased by 22% and they could spend more on their children's education and health and the influence of money lenders has come down. By all these facts and figures the words of Warren Buffet "Don't Save what is left after Spending, But Spend what is left after saving" is proved.

**0501045 KIRAN, S.C AND NAGARAJIAH, C ((Department of Forestry and Environmental Science, College of Agriculture, University of Agricultural Sciences, GKVK, Bengaluru-560065). MANAGERIAL CONCEPT FOR SCALING UP FOR RURAL DEVELOPMENT IN TERMS OF ENTREPRENEURSHIP**

The entrepreneurial orientation to rural development accepts entrepreneurship as the central force of economic growth and development, without it other factors of development will be wasted or frittered away. However, the acceptance of entrepreneurship as a central development force by itself will not lead to rural development and the advancement of rural enterprises. What is needed besides is an environment enabling entrepreneurship in rural areas. The existence of such an environment largely depends on policies promoting rural entrepreneurship. The effectiveness of such policies in turn depends on a conceptual framework about entrepreneurship, i.e., what it is and where it comes from. Rural development is more than ever before linked to entrepreneurship. Institutions and individuals promoting rural development now see entrepreneurship as a strategic development intervention that could accelerate the rural development process. Furthermore, institutions and individuals seem to agree on the urgent need to promote rural enterprises: development agencies see rural entrepreneurship as an enormous employment potential; politicians see it as the key strategy to prevent rural unrest; farmers see it as an instrument for improving farm earnings; and women see it as an employment possibility near their homes which provides autonomy, independence and a reduced need for social support. To all these groups, however, entrepreneurship stands as a vehicle to improve the quality of life for individuals, families and communities and to sustain a healthy economy and environment.

**0501046 KIRUTHIKA, S. AND KUMAR, SURESH (Department of Agricultural Economics, Centre for Agriculture and Rural Development Studies, Tamil Nadu Agricultural University, Coimbatore-641003). ANALYZING LONG TERM CHANGES IN GROUNDWATER UTILIZATION AND DISTRIBUTIONAL INEQUALITY**

Development of groundwater irrigation (GWI) has been very impressive in India, especially after the introduction of the green revolution. The area under GWI accounts for 62% of the net irrigated area today. The area irrigated by groundwater increased at the rate of 3.50% per annum while net area irrigated by canal and tank declined by 0.14% and 2% per annum respectively. Though GWI provides added benefits to farmers, compared to other sources of irrigation, the continuous exploitation of groundwater of late has resulted in a drastic drop in the

water table, and led to salinization and quality deterioration in different parts of the country. Over exploitation of groundwater has increased despite its positive effects on overall economic growth of the country. Better equality in development and distribution of surface irrigation systems can be achieved by government as it has lot of direct say. But most of the wells and tube wells are under direct ownership of farmers. Hence government can't be successful with groundwater development. There arises a need to study inequality in distribution of groundwater resources between different land holders and the extent of depletion of groundwater resources. The study analysed the extent of depletion of groundwater resources in the nine critical states of India and the inequality in distribution of groundwater sources among different farm size class was assessed by calculating Theil's Index. Secondary data on number and area of land holdings according to farm size class was collected at national level and state level from All India Report on Agriculture Census 2005-2006 and 2015-2016. Number of dug wells, tube wells – shallow, medium and deep tube wells owned by different farm size class was collected from 4th and 5th Minor Irrigation Census. In this study, the persistence of inequality in land ownership and distribution among various farm size class at national level and state level was confirmed with increase in Theil's Inequality index from 0.153 in 2005-2006 to 0.420 in 2015-2016. Unequal distribution of groundwater sources in favour of medium and large farmers was proved by the Theil's index of 0.607 in 2005-2006 which increased to 1.071 in 2015-2016. Haryana state has the highest inequality in both distribution of land and groundwater sources among different farm size class. In India, substantial inequality persists in the distribution of land among different farm size class which in turn led to inequality in accessibility of groundwater resources. Depletion of natural resource is clearly defined by the positive relationship between inequality in access to land and groundwater resources with percentage of blocks under critical and over exploited regions across major states of India with correlation coefficient increasing from 0.30 to 0.43 over the decade.

**0501047 KUMAR, ANIL; ADAN, FARIHA AND KRISHNA, THOTA GOPI (Department of Plant Breeding & Genetics, BAC, Sabour, Bhagalpur)-STUDIES ON GENETIC VARIABILITY PARAMETERS FOR SEED YIELD IN LENTIL (*LENS CULINARIS* MEDIK.)**

Thirty six lentil genotypes (collected from different parts of India and from abroad) including two checks were analyzed for seed yield and its components by estimating genetic variability. Analysis of variance showed highly significant differences among the genotypes for nine traits but non significant for number of primary branches per plant, number of pods per cluster and number of seeds per pod. High heritability estimates were recorded for the traits viz., 100-seed weight, followed by grain yield per plant, biological yield per plant, number of pods per plant, number of filled pods per plant, number of secondary branches per plant and plant height. In general phenotypic coefficients of variation were observed to be greater than their corresponding genotypic coefficients of variation. High estimates of heritability coupled with high genetic advance were documented for 100 seed weight, grain yield per plant, biological yield per plant, number of pods per plant, number of filled pods per plant and number of secondary branches per plant indicating that selection in such traits might be effective. Hence these traits could be used by breeders for the improvement of seed yield resulting in the unfolding of high yielding varieties of lentil.

**0501048 KUMARI, ARCHANA (Central University of Rajasthan) WHETHER LIVESTOCK CAN SUPPLEMENT HOUSEHOLDS INCOME THROUGH SUSTAINABLE AGRICULTURE**

India has very large population of livestock. It is an integral part of a mixed farming system. Livestock is the supplements to the livelihood of almost entire farming households in rural India. It is the aggregate level more the four- fifth of rural farming households process some species of livestock in India. This is major source of livelihood for the landless, marginal, and small farmers. The gap between the demand and supply of fodder is increasing due to competing pressure on land. The question remains as to how to augment feed and fodder resources to keep the process of livestock growth growing. Whether that is also need to develop suitable draft animal breeding policy and development strategy suitable for them. Is there only need to augment the technology?

This paper is an attempt to look into the question of natural recourses linkage for development of livestock. This study is based on secondary data from relevant official records and literature.

Findings suggest that dung is major source of nutrients for crop production and for sustaining soil fertility. It livestock is an important factor in growth of marginal areas like arid rainfed regions because of higher

concentration of poor, limited benefits of green revolution technologies, climatic uncertainties etc. The other important of agro-ecological approach to agricultural development had also been documented.

Findings suggest that the main reasons for these are poor feeding, low quality animals and inadequate veterinary facilities. There is need to understand the structure of livestock sector, and factor that affected growth of livestock output. There is need to improve veterinary facilities in rural areas, improve composition and quality, of bovine, and ensure better return to livestock farmers through improved market outlets, effective spread of dairy co-operative, expansion of processing capacity and better availability of feed and fodder. It is important that livestock development policy focused on the utilization of natural resources taking into account the ecological consideration. There is need to re-orient the government policy for delivery livestock. There are two aspect of requirement policy attention. One is infrastructure facilities and other enhancing feed and fodder availability for livestock. The topography requires creation of mobile veterinary and health care facilities covering the vast stretch of area.

**0501049 KUNDU, ANIRBAN AND MUKHOPADHYAY, SAYANI (Department of Geography, Asutosh College, Kolkata)-A STUDY OF IMPACT OF CLIMATE CHANGE ON SUBSISTENCE AGRICULTURE ALONG THE COASTAL PLAIN OF EAST MEDINIPUR, WEST BENGAL : A GEOSPATIAL INVESTIGATION**

Climate change is one of the most alarming issues of the recent century for policymakers. According to the special report of IPCC (2018), the global temperature will lead to an increase of 1.5°C by 2030-2050. Sea level is also likely to rise almost  $\geq 1$  metre by 2100 AD and the low-lying coastal areas are more vulnerable to these changes. The 65.5 km coastal belt of East Medinipur district of West Bengal is mainly inhabited by subsistence paddy cultivators. However, from the last decade, this intensive agricultural system has been severely disturbed and farmers are trying to find out substitute for agriculture. Agricultural land is converted into commercial fishing ground resulting in damage of soil quality of the adjacent agricultural fields. This paper investigates how far climate change is responsible for this change in the agricultural system in this area with the help of Geospatial and some empirical statistical techniques. Remote sensing based land-use study and change detection study has been carried out from 1973-2019 and the shift of agricultural land to other land use has been observed. The changing trend in the temperature and precipitation and their relation with changing land use has been examined through statistical analysis. Along with that, through DEM image analysis, areas that can be inundated due to increased sea level of upto 1 metre has also been investigated. The results reveal that monsoon rainfall pattern is shifting in the area and there can be a relation of this change with the shrinkage of agricultural land. Moreover, farmers have shifted their Crop Calendar with shifting monsoonal pattern and in some of the villages sea water intrusion is already a major issue. Further, some suitable adaptation strategies for the revival of this subsistence agricultural system have also been recommended.

**Keywords: Global warming, Geospatial, Land use, Change Detection, Sea level rise, Climatic components, Adaptations.**

**0501050 MAJI, SUJIT and MUKHOPADHYAY, SAYANI (Department of Geography, Asutosh College, University Of Calcutta)-ROLE OF FAMILY LABOUR INVOLVEMENT TO THE FLOWER CULTIVATION FOR SURVIVAL OF THE FARMERS IN THIS SECTOR: AN ANALYSIS ON SELECTED BLOCKS OF HAORA DISTRICT, WEST BENGAL.**

The flower cultivation in West Bengal is basically characterized with high number of manual labour involvement as compared to the other types of cultivation. But day by day increment of agricultural labour wages and absorption of agricultural labourers by the other sectors have made uncertainty in availability of cheap as well as skilled agricultural labourers in flower cultivation. For trying to overcome this situation, a tendency to give much more labour from the farmer's family is being observed in the floriculture concentrate areas of Haora district. So the present study aims to examine how far the family labour engagement to the flower cultivation is necessary for the survival of the farmers to this sector as well as recovering from labour related challenges. Moreover, it is necessary to highlight different issues like how much labour intensive is the flower cultivation, the present status of family

involvement in cultivation and how much can they increase their earnings through family involvement. The study was conducted on the floriculture concentrate areas named Bagnan I and II blocks in Haora District, West Bengal. For that random sampling techniques have been applied in the field survey and cost benefit analysis (two types - without family labour and with family labour) of selected flower cultivations have been done to find out the effects of the family engagement to the earnings. After the study it has been found that the family involvement plays a significant role not only to overcome the labour related issues but subsequent income increasing stages also.

**Key words: floriculture, cost-benefit analysis, family involvement, cheap and skilled labour**

**0501051 MUNIYAPPA, N C (Agriculture Government of Karnataka). DISPARITIES AND ECONOMIC GAPS BETWEEN MARGINALISED COMMUNITIES AND GENERAL POPULATION IN AGRICULTURAL SECTOR IN KARNATAKA**

The erstwhile maharaja of Mysore has laid a strong foundation for the sustainable agriculture by providing canal irrigation through reservoirs like Krishnaraja Sagar and Vanivilas Sagar, minor irrigation through construction of large number of tanks for the welfare of farmers. However the marginalised sections are deprived of any of these benefits as they had no ownership of any land in those days. The subsequent elected governments through many progressive legislations like Land Reforms Act and Land Grant Rules have helped them to acquire ownership of lands to maintain dignity and status in the village. This has resulted in a social revolution in the state maintaining social equity in the feudal society. Most of the poor farmers who became land owners over night had lot of other issues. Their granted land had the average size of the holdings being less than 0.48 ha, the lands were of low fertility and organic content, barren and uncultivable, unproductive and unviable in nature. The government which was so enthusiastic to make them as right full owners has not shown similar seriousness to these farmers to design the right schemes. These sections have the total land holdings of 10.71 lakhs of which more than 85% are small and marginal farmers of the total holdings. 75% of the holdings are located in rain fed taluks where the rainfall is less than 750 mm. These farmers require more programs for land development, individual irrigation, timely credit, agricultural inputs, suitable technologies for the increased cropped area, irrigation potential, production and productivity. They need a central focus on small and marginal farmers centric approach rather than the general and populist strategies. Being marginalised sections, their access to the resources do have a serious constraints as most of the current programs are not helping them to achieve required productivity in their lands which needs altogether different paradigm shift. The state should strive hard to identify various development gaps and disparities in production and productivity in general and the agricultural income gaps in particular among the marginalised sections like scheduled caste and scheduled tribes. It is necessary to find out suitable strategies with the help of several success stories based on world bank projects implemented in the state and several sustainable technologies developed by the universities to make these farmers as agricultural entrepreneurs. As the agricultural growth rate in Karnataka has remained stagnant or negative over the years, it is necessary to bring more land holdings of these sections to improve the growth rate for sustainable agriculture to at least 2 % and bring them in to inclusive economy and development with the main stream population.

**0501052 NAGARAJU, Y; BABU, SACHINDRA AND VENKATESH, M (Dairy Economics and Business Management, Dairy Science College, Hebbel Banaglore)-IMPROVING LIVELIHOOD SECURITY OF RESOURCE POOR FARMERS UNDER DIFFERENT FARMING SYSTEMS APPROACH : IN CHICKBALLAPUR DISTRICT OF KARNATAKA STATE:AN ECONOMIC ANALYSIS**

The paper based on the study of current different farming system practices for improving farmers income and employment, especially among the rural poor. The study was conducted in Chickballapur District of Karnataka state to assess impact of integrated farming systems approach on the holistic development of resource poor farmers: five major farming systems C+D, C+S+D, C+D+SH, C+D+SH+PG, C+D+SH+P were noticed based on bench mark survey and previous studies in the area. The study based on primary data from 300 farmers covering equal samples under major farming systems elicited for the period 2013-14 through interview Scheduled technique. The data was analyzed using Gini co-efficient analysis Cobb-Douglas production function, Garret ranking. Results showed that the net income per annum realized by a household was highest in C+D+SH+P (Rs 101818) net income,

less realized in case of C+D (Rs 37,217). Area under vegetable crops (ha) was found C+D+SH+S (0.92) is highly significant against net annual income when comparing other farming systems Area under field crops. Employment generation was found in C+D+SH+P (325 man days/year) where as in case of C+D (321 man days/year). From above study it can be concluded Integrated farming system approach helps to stable income from farm as well as whole. Thus, there is a great need for this approach to improve overall livelihood security was better among C+D+SH+P farm households.

**Key words:** Integrated farming system, economic analysis, employment generation, livelihood security

**0501053 NAGARAJU, Y; BABU, SACHINDRA AND VENKATESH, M (Dairy Economics and Business Management, Dairy Science College, Hebbel Banaglore)-ENHANCING INCOME THROUGH MICRO-FINANCE FOR THE VULNERABLE GROUP OF FARMERS IN SOUTHERN KARNATAKA**

Integrated farming system is integration of two or more appropriate combination of enterprises like crop, dairy, piggery, fishery, poultry, bee keeping etc., for each farm according to the availability of resources to sustain and satisfy the necessities of the farmer. Integrated farming system beneficiaries involved in promoting savings among members and use the pooled resource to meet the emerging needs of their members not excluding consumption needs, with collective action. The basic objectives of Integrated farming system - Sangha's are to develop saving capability among the homogeneous vulnerable poor sections of the society, to reduce dependence on financial institutions for self-reliance. Integrated farming system beneficiaries involved in promoting savings among members and use the pooled resource to meet the emerging needs of their members not excluding consumption needs, with collective action. The basic objectives of integrated farming system - Sangha's are to develop saving capability among the homogeneous vulnerable poor sections of the society, to reduce dependence on financial institutions for self-reliance. The maximum numbers of beneficiaries of IFS Sanghas in each district were below the age group of 30 years. Integrated farming system beneficiaries joined Sanghas primarily for savings, in Bangalore rural district 75 per cent of respondents joined Sanghas for the purpose of savings followed by Kolar, Chikballapur and Shimoga. And remaining beneficiaries have joined Sanghas for getting loans and others. After joining Integrated farming system Sanghas beneficiaries income has increased which makes change in their economic status, maximum number of beneficiaries about 91.67% supported this statement. Along with this, some of the beneficiaries showed positive responses towards self confidence, getting respect from family, neighbors and society, reduction in family violence, helping family in financing, improvement in their basic amenities and assets etc. (NIS Chowdhury, 2009).

**Key words:** Integrated farming system, IFS Sangha, Farming Community and IFS beneficiaries

**0501054 PANJA, SUMIT AND MUKHOPADHYAY, SAYANI (Department of Geography, Asutosh College, Kolkata)-IMPACT ASSESSMENT OF CLIMATIC VAGARIES ON CROP CALENDAR OF COASTAL AREA: A VILLAGE LEVEL CASE STUDY OF EAST MEDINIPUR, WEST BENGAL**

The frequent occurrence of climatic vagaries like shortage of rainfall, erratic rainfall, cyclones, heat waves, etc. have severe impacts on agriculture. These climatic vagaries are the great concern for disruption in crop calendar, crop production, and stability in crop management. In the era of climate change, these types of vagaries are increasing at an alarming rate. According to the IPCC report, 2007, coastal areas are the most vulnerable to climate change-induced phenomena. The coastal plain of East Medinipur District in West Bengal, bordering the Bay of Bengal, suffers regularly from severe cyclonic storms and depressions. After analyzing secondary climate data of the last 100 years it is clear that there is a noticeable change in the period of onset of the rainy season in the study area. Even in the current year, the onset of monsoon was late by two months. The present paper deals with the impact of such climatic vagaries on agriculture, especially on crop calendars in rural areas along the coastal areas of East Medinipur district, West Bengal. The study has been done by a village-level questionnaire survey based on farmer's perception and relevant secondary data have been analyzed by statistical methods and represented through suitable cartographic techniques. The study reveals that the sowing period of Aman Rice is getting delayed, which affects the

production. Some GIS techniques have also been applied to analyze the remotely sensed data of the study area. The paper also recommends some adaptive strategies.

**Keywords:** climatic vagaries, agricultural community, crop calendar, Aman rice, GIS techniques, statistical techniques.

**0501055 PATIL, ROOPA B; SHANKARA, M.H; GOWDA, GOVINDA V AND DESAI, NAGAPPA (ICAR-Krishi Vigyana Kendra, Tumakuru-572104). PROCESSING AND VALUE ADDITION IN LITTLE MILLET**

Millets are of minor importance in the west but a staple food in the diets of African and Asiatic people. Their agricultural importance arises from their hardiness, tolerance to extreme weather and could be grown with low inputs in low rainfall areas. ICAR-KVK, Tumkur I has conducted Front Line demonstration on Processing and value addition in little millet. The Self help group members of Patrehalli village of Tiptur taluk, Tumakuru district, Karnataka, India were considered for the implementation of programme. Totally 20 beneficiaries were selected for the programme and systematically implemented with technical sessions on value addition, processing, branding and market linkage. Their product also has been registered under FSSAI. The result reveals that, majority (>92.00%) of women beneficiaries were unaware about importance of processing and value addition in little millet. About 94.00 per cent of them were unaware about nutritional importance / health benefits and 64.00 per cent of them had poor skill on processing, branding and labeling of value added products to get higher market price. With respect to economic analysis of the implemented programme in little millet KVK has organized technological interventions in scientific processing, packaging, branding and channelized with suitable marketing. With this the beneficiaries have made an gross cost of Rs 4700 per quintal for the above practices and obtained an gross return of 9500 per quintal with benefit cost ratio of 2.02.

**Key words:** Little millet, Processing, Value addition, Knowledge

**0501056 PRASAD, V. RAJENDRA; INAMDAR, RAJENDRA M.; KUMAR, PRASHANTH R; SINGH, N. K. AND LEELA, M. H. (ANGRAU-Agricultural College, Naira-532185)-BRANDING OF PAPRIKA OLEORESIN IN CHILLI – CHALLENGES AND OPPORTUNITIES**

Chilies are integral and the most important ingredient in different cuisines around the world as it adds pungency, taste, flavour, and colour to the dishes. Commercial red chilly oleoresins are mainly used as a spice supplied in pungency ratings between 80,000 and 500,000 Scoville units (approximately 0.6-3.9% capsaicin w/w) and a wide range of colour. Four companies based in Kerala controls more than 80 percent of India's Rs. 2000 crore spice paprika oleoresin. In view of the competition from the China in international trade and the expanding domestic food sector in terms of readymade foods, ready to cook foods etc. revisiting the business strategy of expanding oleoresin exports felt essential. This paper identified GI granted Byadgi chilli which is essentially sweet and not so spicy and its oleoresin uses in food, cosmetics, confectionery and beverage industry. As the global oleoresin market is expected to reach USD 1.69 billion by 2022, a brand canvas was contemplated with brand elements like logo (BYOL), Slogan (Make tastier and Colorful your dishes), Packaging 100 & 500 grams tinned packaging with display of logo, slogan, USFDA and FSSAI certification, ingredients, usage, manufacturing and expiry date, ASTA number and batch mark, AGMARK etc. with a long term perspective to tap European and Middle East market.

**0501057 PRAYAG (Department of Animal Genetics and Breeding, Veterinary College, Hebbal, Bangalore-560024). SCIENTIFIC MITIGATION MEASURES FOLLOWED BY KARNATAKA GOVERNMENT TO OVERCOME HUMAN-LEOPARD CONFLICT IN MADDUR RANGE**

Leopards are highly adaptable species and are also found in and around human dominated areas and agricultural lands. In India human-leopard conflict is becoming more common and is now major issue in forest side villages, causing loss of lives of humans as well as Animals. The Present study aims to provide a brief analysis of the project carried out by Karnataka Forest department to capture and translocate the conflict causing leopard from Maddur range of Mandya division Karnataka to a safer habitat away from human interference. An adult leopard in



Maddur range was suspected to kill an elderly farmer in his agricultural field during night. The project was carried out for almost two years from the first sight of leopard in village by villagers (Dec2013) till capturing of animal and post capture monitoring (Dec2015). Scientific Mitigation Measures were followed as per NTCA protocol and MOEFCC Guidelines. The precautionary measures and importance of animal protection were educated to the villagers and awareness was created among huge masses in villages. The individual leopard was identified using camera traps and was then successfully trapped in cage and transported to Mysore Zoo for Medical examination, After which it was finally transported to Bannerghatta Rehabilitation centre. It was observed in project that the leopard never intentionally attacked any human and preyed usually on stray dogs and rarely on livestock animals. It can be concluded that for long term solution, better understanding of animal behaviour is a must along with the awareness and education of people and not all leopards which are branded man-killers is true as found in this case study. Appropriate decisions should be taken in concurrence with existing 1972 wildlife act NTCA and MOEC&CC Guidelines and protocol.

**0501058 RAVINDRA, USHA (Dept. of Food Science and Nutrition, University of Agricultural Sciences, GKVK, Bangalore-560065). NUTRIFARMS: A LONG TERM STRATEGY TO PREVENT MALNUTRITION AMONG THE RURAL WOMEN**

Malnutrition in India, especially among children and women, is widespread, acute and even alarming. Most of them suffer from 'Hidden hunger' or micronutrient malnutrition. Among the women nearly 64 per cent are anaemic. One of the major causes for malnutrition in India is economic inequality. Due to low social status of some population groups, their diet often lacks in both quality and quantity. Women who suffer from malnutrition are less likely to have healthy babies. Deficiencies in nutrition inflict long-term damage to both individuals and society. Hence, preventive measures play a very significant role in combating malnutrition. Agriculture in most part of the rural India continued to be the major livelihood activity of both farming and non farming communities which has direct impact on food and nutrition security. Therefore, a study on nutrifarm intervention to achieve food and nutrition security of rural families was undertaken covering 600 selected women and their families [each group G-I, G-II and G-III had 200 families] from six villages in Chamarajanagar district of Karnataka. Baseline data collection on socio-economic status, health and nutrition status assessment through anthropometric measurements, food and nutrient intake followed by screening of women and children for malnutrition using Primary Health Center and Anganawadi facilities for two years period was carried out. Awareness and skill development programmes were imparted to develop human resource to change knowledge, attitude and practices (KAP) for crop production and food consumption to reduce malnutrition. Results of the study revealed that, 71 per cent of the women followed agriculture as a occupation with marginal land holding. As per the Body Mass Index (BMI) 19.5 % of women were under weight, 22 % overweight, 24 % obese and 34 % were falling in normal category. This trend was changed in G-III (nutrifarms and nutrition education) and G-II (only nutrition education) after the intervention than G-I (control). Significant change in food and nutrient intake, nutrition status, morbidity and co-morbidity status was recorded before and after the intervention. Non significant differences for BMI, Lean Body Mass Index was recorded between the groups. Hb levels among three groups changed from deficient to acceptable level (<math>\lt; 10\text{g/dl}</math> to <math>\geq 12\text{g/dl}</math>), 37-57% women in G-III and 33-43% in G-II and no significant difference was recorded in control group. 15 awareness programmes and eight skill development trainings on dietary diversification through value addition changed their KAP, encouraged rural women to take up income generation activities at KVK Chamarajanagr, where processing unit is established to help needy farmers. Through this study it is concluded that nutrifarms with nutrition education and follow up visits improved the nutrition and health status of women and their families.

**0501059 RAY, SOUMEN (Socio-Cultural Activists & Coordinator, National Platform for Small Scale Fish Workers). THREATS TO LIVELIHOOD: SMALL SCALE FISH WORKERS IN INDIA**

Research has shown that fishing as a means of livelihood existed thousands of years ago. In India, we come across old references to fish. Small and traditional fishers and fish farmers together form a community widely spread across the country. The community is a non-consumptive primary stakeholders and natural custodian of our water bodies. Good production of fish needs clean, unpolluted water which is essential for their livelihood and, therefore, for their survival. The small and traditional fishing communities, always and everywhere, strive to protect water

bodies and fish resources. Sadly, under the winds of commercialisation blowing across the globe this aspect is often ignored. In this short paper I try to present a picture of a glorious role of fishing community in our hoary past and culture; then coming to the present, I intend to have a look at the role of small scale fishers and fish farmers in the production and export, and their contribution to GDP; Overall scenario with emphasis on Contribution to GDP, their problems and predicament or threats emanating from various so-called development mega-projects and their aspirations with regard to their working condition and livelihood.

**0501060 REDDY, K ANIL KUMAR; PRABHAVATHI, Y AND KISHORE, N T KRISHNA (Institute of Agri-Business Management, Acharya N G Ranga Agricultural University, Tirupati-517502). PRODUCT AUGMENTATION THROUGH GAP ANALYSIS OF FARMER NEEDS FOR EFFICIENT AGRI INPUT MARKETING IN ANDHRA PRADESH STATE**

Green revolution in India has not only lead to increase in food grain production, technological advancement but also has commercialized the Indian agriculture, resulting in creation of demand for various agricultural inputs through annual seed replacement with high yielding varieties and hybrids, increase in usage of chemical fertilizers, plant protection chemicals, irrigation systems, adoption of mechanization and timely agricultural credit. Today agri input marketing plays a very important role in making timely availability of these inputs. Agri Input marketers are looking for new ways and developing strategies to enhance the satisfaction levels of the farmers and striving hard to understand the right proposition of marketing mix elements in agri input marketing. Among the four P's of agri input marketing, product plays a very important role and making the products augmented in a highly undifferentiated market for creation of brand loyalty among farmers is a challenge. Further, marketers are trying to use various levels of agricultural information as value added service to build augmented products around the wholesome product for relationship marketing among the farming community. Agri input marketers are trying with innovative business models to support this relationship marketing. As result today agri input retail chains are evolving to achieve these objectives. This study is taken up in Guntur district of Andhra Pradesh state to understand the gap between farmers needs and services offered for agri-inputs, and comeup with suitable business strategies for making the products augmented. Purposive cum random sampling design is employed in the present study. The sample size of the study is 200. Primary data has been collected from sample farmers with help of a schedule through personal interview and the data is analyzed using cross tabulation, chi-square, simple ranking techniques to achieve the objectives of the study. The major findings of the study include sample farmers are majorly dependent on agri-input dealers for purchasing of seeds, fertilizers, pesticides and more dependent on them for all types of services including credit, advisory information and whose recommendations are unscientific in most of the times. Though availability is not a constraint in the study area but there still exists gap between farmers needs with respect to fertilizer information (compositions, timing, dosage) and pesticide information (technical aspects, operational aspects, quality and timing and dosages). Hence, it is recommended from the study that agri input marketers while formulating their business strategies should consider that availability is no more issue in agri input marketing as the penetration of traditional dealer network is very high. Hence focus should be on developing innovative business models through integration of agriculture information with marketing channels through community participation rather than expanding traditional marketing channels. For developing such models involvement of progressive farmers and FPO's for accessing information at village level would lead to competitive advantage.

**Key Words: Green Revolution, Agri-input marketing, Augmented product, marketing channels, community participation**

**0501061 ROY, ARNAB (Department of Agricultural Economics, University of Agricultural Sciences, GKVK, Bengaluru-560065)-A REVIEW OF STUDIES ON GROWTH OF FLOW OF INSTITUTIONAL CREDIT LENDING TO AGRICULTURE AND ALLIED SECTOR IN INDIA**

Credit is a critical input in achieving higher farm output. Institutional credit will also help delink farmers from non-institutional sources where they are compelled to borrow at usurious rates of interest. Since the middle of the fifties, there has been dramatic swell in the supply of agricultural credit in India accompanied by increase in the base of institutions providing such credit. The paper is an attempt to analyze the performance of the financial institutions in loan disbursement to agriculture sector in India. The analysis was made by the application of trend

analysis; calculate ratios and chi- square test with time series analysis. Major finding of the study is that agriculture lending by sample bank has failed to reach the target which given by RBI during the study period. The study reveals that the highest increase in loans issued was in the case of Scheduled Commercial Banks while the lowest was in the case of Co-operatives on the other hand the total number of account holders in scheduled commercial banks has increased from 5,841 to 30,538, whereas the amount of finance increased from Rs. 14,516 to Rs. 2,71,670 in the referred period. The total direct and indirect advances to agriculture outstanding by scheduled commercial banks shown gradual increase from Rs. 59310 crore to Rs. 583343 billion during the reference period. It also notes the neglect of banks to the allied sector — livestock, fisheries, dairying and forestry. Between 2014 and 2016, the allied sector contributed significantly to the agricultural output, with a share of 38-42 per cent. However, its share in total agricultural credit extended by banks to all was only six to seven per cent. The agricultural credit flow has increased consistently over the years, exceeding the target set for each fiscal.

**Keywords:** Agricultural credit, Cooperatives, Calculate ratios, Chi- square

**0501062 SABU, AISWARYA AND RANI, S PADMA (Department of Agricultural Economics, Centre for Agricultural and Rural Development Studies, Tamil Nadu Agricultural University, Coimbatore-641003). A STUDY ON ELECTRONIC NATIONAL AGRICULTURE MARKET IN SELECTED REGULATED MARKETS OF TAMIL NADU**

The launch of electronic-National Agriculture Markets (e-NAM) by the central government in April 2016 is a game changer reform in Indian agricultural marketing. e-NAM as a policy initiative will help in achieving Doubling of Farmers Income by 2022. In Tamil Nadu, 23 agricultural regulated markets (8.27%) have been brought under the e-NAM in two phases as on April 2018. For the implementation of e-NAM, APMC act should be amended with respect to a single point levy of license fee, a single license valid across the country and provision of e- auction as a method of price discovery. But APMC act is not fully amended in Tamil Nadu. The study assessed the awareness of e-NAM, willingness of farmers and traders to participate and constraints in implementation of e-NAM. The willingness of farmers and traders to participate in e-NAM in selected regulated markets was studied using a binary Logit regression model. The logit regression results indicated that remunerative price and computer literacy has positive influence on willingness of farmers to participate in e-NAM. The willingness of traders to participate in e-NAM is positively influenced by computer literacy. Although e-NAM was implemented in 2018, only 70% of registered farmers are aware about e-NAM and only 50% farmers are aware that information about the produce is being broadcasted online for bidding. The study also calls for addressing the issues of delayed payment and unsatisfactory grading facilities for providing the full benefits of e-NAM to the stakeholders. In the selected markets, e-NAM functions as an e-auction platform not as an online trading platform and the study reveals that level of implementation of e-NAM varies from market to market, solely dependent on the market officials.

**Keywords:** agricultural marketing, e-NAM, farmers, traders

**0501063 SHANKAR, ROHITH L AND ANANTHA R (Department of Sericulture, Yuvaraja's College, University of Mysore, Mysuru)-A STUDY ON THE LONGEVITY OF PUPA AND ADULT MOTHS IN SELECTED FEW MULTIVOLTINE AND BIVOLTINE PURELINES OF SILKWORM BOMBYX MORI (L) IN ALL THE SEASONS OF THE YEAR**

**0501064 SHANKARA, M.H; SHIVAMURTHY, M; GANGADHARAPPA, N R; SHIVALINGIAH, Y N AND CHAITRA, T M (Krishi Vigyan Kendra, Tumakuru, & Department of Agricultural Extension, University of Agricultural Sciences, Bengaluru-560065). VULNERABILITY OF FARMERS TO CLIMATE CHANGE AND THEIR SUGGESTIONS TO OVER COME**

Vulnerability of farmers to climate change is intimately related to poverty, as the poor are least able to respond to climatic stimuli. Further, certain regions of the world are more harshly affected by the effects of climate change than others. With this background the study was conducted to know the vulnerability of farmers to climate

change and their suggestions to overcome its ill effects. The data was collected from the Central Dry Zone (Zone - IV) of Karnataka. Tiptur and Chiknayakanahalli taluks from Tumakuru district, Kadur from Chikmagalore district, Arsikere from Hassan district and Challakere from Chitradurga district were selected purposively for the study. Totally, the data was collected from 150 respondents. With respect to exposure of farmers to climate change, rainfall and temperature were selected and majority of farmers in the study area were severely exposed (0.822) and sensitive (0.894) to climate change with lower adaptive capacity (0.576) between the year 2013-2017. Climate Vulnerability Index (CVI) of Arsikere, Kadur, Tiptur, Chiknayakanahalli and Challakere taluk was 0.186, 0.226, 0.224, 0.220 and 0.241, respectively. The overall CVI value of all selected taluks of Central Dry Zone of Karnataka was 0.218. The data revealed that, the majority of the farmers suggested, Government has to take necessary steps to fill the water bodies in villages (I) followed by Providing more number of drip/ sprinkler irrigation facility to cover maximum farm families (II), Subsidies/compensation has to be given for the crops to make up the cost of cultivation due to weather aberrations (II), Development department should ensure supplying of production inputs at appropriate time in the villages (III), Support price has to be given to all the crop produce based on cost of cultivation (IV), Creating awareness to the farmers about appropriate adaptation measures against climate change (V) etc.,

**Key words: Farmers, Climate change, Vulnerability, Suggestions**

**0501065 SINGH, AKANKSHA AND PUNIA, DARSHAN (G.B. Pant University of Agriculture and Technology, Pantnagar, Utrakhand)-UTILIZATION OF PROCESSED AMARANTH GRAIN IN FORMULATION OF VALUED ADDED *Sev* AND ITS CHARACTERISTICS**

Amaranth is a fast growing crop which can grow under varied soil and agro-climatic conditions and is also resistant to heat and drought with no major disease problems. It is a rare plant whose leaves are eaten as vegetable while seeds are eaten as cereal. Because of its similarity with other cereals, it has been considered a pseudo-cereal which can be an alternative rich source of protein and nutrients for poor people in developing countries. Amaranth is a plant with high nutritional value, whose nutrients are concentrated in the leaves and the grains. Amaranth seeds have attracted attention as a human nutritional source because, compared with the major cereals, they contain higher amount of protein with a well-balanced amino acid composition as well as minerals, vitamins, and phytochemicals compared to those of major cereals such as wheat and rice. This paper reports the sensory characteristics and nutrient composition of four types of *Sev* prepared from amaranth flour. Four levels of amaranth grain flour in *Sev* i.e. 30% (Type-I *Sev*), 40% (Type-II *Sev*), 50% (Type-III *Sev*) and 60% (Type-IV *Sev*) were used. Bengal gram flour *Sev* served as control. On the basis of sensory evaluation results indicated that the *Sev* prepared by incorporation of amaranth flour upto 60% was found to be acceptable. The findings on proximate composition of *Sev* revealed non-significant differences in moisture content. Crude protein content of *Sev* incorporated with amaranth flour decreased significantly as compared to control *sev* (22.60%). On the other hand, fat, crude fibre and ash contents increased significantly in *Sev* prepared with amaranth flour as compared to their respective controls. Similar increasing trend in total, insoluble and soluble dietary fibre content was observed in *Sev* prepared with incorporation of amaranth. Total mineral content like calcium, zinc, iron and potassium increased significantly with the increase in level of amaranth flour in *Sev*.

**0501066 SINGH, RANA PRATAP (Department of Environmental Science Babasaheb Bhimrao Ambedkar University Vidya Vihar, Raebareli Road, Lucknow)-FOOD AND NUTRITIONAL SECURITY FOR MOUNTING INDIAN POPULATION**

India is one of the populous country which adopted green revolution package in 1960s and onwards in many cropping systems which deteriorated agro-ecosystems, below ground and above ground biodiversity, contamination of soil, water, air and food with multiple known and unknown toxic substances used as agrochemicals. The food and nutritional security in India is not limited to the concerns on food production but also food storage, practices of cost saving and eco-friendly innovative technologies as well as an effective marketing network which can attract educated young people in agriculture sector. Indian agriculture is predominated with

small scale and marginal farmers who are poor, uneducated and having low or no risk bearing capacity. The forward and backward linkages of agriculture, use of innovative technologies suitable for such conditions and low external input ecological farming with good marketing management can help the young farmers to get attracted, get strengthened and get educated for developing a new agroecosystem to provide an uncontaminated healthy and safe food security to people. Protein, mineral and vitamin malnutrition are another concern for food security in India which can be managed by increasing the acreage and yield of pulses, vegetables and fruits etc. The technologies and research methodologies available with research institutes and universities dealing with agriculture are not reaching to the farmers because of poor extension and outreach services in the country and low or no education in the farmers. The emerging crisis related to climate change and global warming are another major concern for food and nutritional security in the world in general and India in particular. Agriculture, horticulture, fishery and animal husbandry etc. are considered as the most vulnerable sectors to changes in climatic and edaphic factors. India is required to evolve a new strategy for management in production, processing and marketing in agriculture, horticulture, fishery and animal husbandry etc. Local and organic inputs with desired technological interventions can help in achieving non-toxic food in a sustained way with low investment on one hand and can help in establishing small and medium scale rural, semi-urban and urban industries which can provide jobs to a large number of unskilled or semiskilled youthful population. It will help in obtaining peace, stability and income through the agricultural practices which is yet a dominating sector in Indian context. The semi-mechanised and mechanised tools and machines operated by renewable energy sources e.g. solar panels and bio-fuel etc. can reduce the involvement of labor and limit the emission of Green House Gases (GHGs) from the agriculture sector. The construction of green house, poly house, tunnels etc. can enhance the area of protected and multitier agriculture in less acreage. The farmers cooperative or commercial agriculture can be developed which will enhance the risk bearing, capabilities of the farmers and facilitate the use of existing agricultural machines. We are interacting with farmers to understand their problems and potentials in certain areas of Eastern Uttar Pradesh.

**Keywords: Agro-ecosystem management, Ecological agriculture, Marketing network, Protected agriculture, Small scale industries.**

**0501067 SINGH, SARABJEET; KAUR, HARPRIT AND SINGH, AMANDEEP (Department of Agri. Jour. Lang., Punjab Agricultural University, Ludhiana)-RELATIONSHIP OF DEBT AND DRUG ADDICTION WITH STRESS INDEX OF FARMERS OF PUNJAB, TELANGANA AND MAHARASHTRA**

An article 'Report: 16,606 farmer suicides in 15 years' published in *The Tribune* (2018) revealed that 16,606 farmer suicides have been reported during 2000-2015 (The Tribune, January 11, 2018). The main aim of the present study was to see the relationship of socio-personal profile including debt and drug addiction with stress index including psychological distress, suicidal ideation, suicidal behaviour, cognitive distortions & depression. The study comprised a total of 1000 farmers from villages of Punjab, Maharashtra and Telangana who were administered socio-demographic sheet, Stress index scales comprised of General Health Questionnaire-12 (GHQ-12; Goldberg, 1972), Suicidal Behaviour Questionnaire-Revised (SBQ-R; Osman *et al.*, 2001), Modified Scale for Suicidal Ideation (MSSI; Miller *et al.*, 1991), Cognitive Distortion Scale (CDS; Briere, 2000), and Beck Depression Inventory-II (BDI-II; Beck, 1996). It was hypothesized that there would be a positive relationship of drug addiction, debt with stress index of farmers of Punjab, Telangana and Maharashtra. The obtained results revealed that positive relationship was found between debt and stress index ( $r = .074^*$ ,  $p = .005$ ) and drug addiction with stress index ( $r = .141^{**}$ ,  $p = .001$ ). Implications and limitations would be discussed in the presentation.

**0501068 SINGH, SARABJEET; KAUR, HARPRIT AND VASUNDHRA (Department of Agri. Jour. Lang., Punjab Agricultural University, Ludhiana)-FARMER SUICIDE PREVENTION: PEER SUPPORT INITIATIVES AND SUICIDAL IDEATION AMONG FARMERS OF MAHARASHTRA, PUNJAB AND TELENGANA**

Suicide is an extremely intriguing and intricate phenomenon, yet farmer suicides have been rarely debated beyond economic and agricultural solutions. An inter disciplinary team (psychology, social work, extension education, human development, mass communication) endeavored to study the effect of peer support in farmer

distress management in Punjab, Telangana and Maharashtra. It was based on the premise that scientifically developed peer support system helps the farmers to come out of distress. Baseline and End line Surveys of 1000 households was conducted with a customized self-structured questionnaire having tools measuring psychological distress, suicidal ideation. The results were compared using paired t-test, correlation, regression, factor analysis. Documentation of case studies was also undertaken.

It was found that psychological intervention given by peer support volunteers (PSVs) was effective in alleviating the suicidal ideation of farmers. Paired samples t-test results of pre and post intervention phases revealed that intervention has significantly reduced scores of Suicidal Ideation (MSSI). Those who scored high on resilience approached other people and situations with confidence and bounce back quicker than expected, therefore, having better psychological well-being. Farmers with higher levels of well-being tend to report less mental distress overall, bounce back from negative events faster, and experience a lesser decrease in their mental health when they encounter a potentially stressful or challenging situation. Suicidal ideation emerged as significant predictor of suicidal behaviour. Paired samples t-test results of pre and post intervention phases revealed that intervention has significantly reduced scores of stress index.

To manage the agrarian distress, recognize farmers' distress as an agricultural problem and farmer suicide prevention as an agricultural development priority. Only vibrant farmer can do vibrant farming. Farmers having a readily available peer support system witnessed a significant decline in their stress index (SI) which leads to fewer suicidal ideations. Case studies also point to the fact that social connectedness, offering of hope and help to a distressed farmer helps one in facing the challenges of life in a better-informed way. SAUs should now start distributing the seeds of resilience, tolerance and contentment among the farmers. Dispel the culture of shame associated with mental illness. Suicide prevention should be the core component of extension services: Encouraging adoption of simple lifestyle and curtailing lavishness on weddings and other social ceremonies; destigmatizing mental health issues, talking about depression; building strong family and social bonding by focusing on love, dedication, care, support. SAUs should hire psychologists and counsellors; extension publications should publish material on battling negative thoughts, facing challenges of life boldly; Helpline to manage distress among farmers is urgently required; Changing the media depiction of suicidal behaviour can help a lot in reducing suicide rates; Advocacy for farmers for financial literacy; Means restriction; Strengthening the familial and social bonds; Dotting of rural landscape with motivational slogans can be very helpful.

**0501069 SPANDANA, K N AND GRACY, C P (Department of Agricultural Marketing, Cooperation and Business Management, College of Agriculture, University of Agricultural Sciences, GKVK, Bangalore-560065). CONTRACT FARMING IN MARIGOLD CULTIVATION – A SOCIO-ECONOMIC STUDY IN HASSAN DISTRICT OF KARNATAKA**

Contract farming is an agreement between farmers and marketing companies/firms for the production of agricultural produce and supply of the same underneath a forward agreement, usually at pre-set price. The agreements additionally permit the customer to supply agricultural inputs and technical guidance for the production of crops. Contract farming has wide connections for both farmer and purchaser, providing their long association is reciprocally complementary. In India the larger per cent of the farming community belongs to marginal and small farmers' category. Contract farming, therefore, gained prominence as it permits their agricultural produce to be purchased by small firms, multinationals, government agencies, farmers' cooperatives and individual entrepreneurs. Contract farming in India is changing towards the corporate contract model as reflected by the entry of many multinationals. A number of agricultural commodities and animal products are produced under contract farming. There is a vast demand for natural colors of calendula, hibiscus, petunia, gomphrena, marigold etc., in the international market and marigold is one such potential flower for natural color extraction. The carotenoid pigment is supplementary to intensify the yellow-orange color of egg yolk by adding in the poultry feed. Today, it is one among the foremost commercial flowers grown world-over and in India. The study was conducted during 2018-19 to analyse socio- economic profile of marigold farmers of Belur taluk inHassan district of Karnataka state. The primary data collected from 80 farmers were analysed through descriptive statistics and Best-worst Scaling. The average family size was six members, 77 per cent of farmers were educated; average annual household income was Rs. 73,412.5. The average size of land holding of the sample growers was 3.42 acres out of which dry land was 1.74

acres. Thus, the percentage area under dry land was more compared to irrigated land and marigold production is taken up in rainfed area. The flower production was taken up in a minimum area of half an acre and maximum area of three acres, while the average area was 1.75 acres. One acre of marigold crop requires a total of 45.28 human days, of which 59.19 per cent was family labour and 40.81 per cent was hired. This shows that most of the operations are easy and hence handled by family labour. Similarly, in terms of male and female labour employment, 72 per cent was through male workers and 28 per cent of the operation through female workers. Among the various operations, the labour for harvesting accounted for 32.86 per cent of the total labour days (14.88). Farmers made advance payments and conveyance facility to labourers because of labour scarcity. The contractual arrangement between company and farmer for flower showed the firm supplies seeds, fertilizers, and plant protection chemicals for each plot. The charges towards supplied inputs were deducted at the time of payment by the company. Best-worst scale analysis of farmers preference for marigold contract farming revealed that good yield, quick and timely payment, technical know-how were ranked II-IV in that order with standard scores of 46.50, 44.00 and 37.25.

**Keywords: Economic analysis, Marigold, Contract farming**

**0501070 SWAMY, NARAYANA V (IDeA Worldwide College, Bangalore). SILK FABRIC DYED WITH EXTRACT OF THESPESIA POPULNEA: ASSESSMENT OF COLORIMETRIC AND ANTIMICROBIAL PROPERTIES**

In this report we describe how the dried leaves of *Thespesia populanea* have been estimated for their potential as a source for natural dyeing of silk fabric. These dried leaves are abundant, cheap and readily available as an agricultural byproduct. Extracting procedures from the leaves were undertaken under different operating conditions such as extraction pH (10), time (90 min) and temperature (95°C). The dyeing was carried out using 10% o.w.f. dye concentration with and without the use of alum, tannic and tartaric acid mordants. It was found that mordants have a significant effect on the color of dyed silk fabrics. The color strength (K/S), coordinate values and color fastness properties of the dyed samples were assessed. The K/S values were enhanced with the increase in dye absorbance and the mordant used. The dyed silk samples which were tested for antimicrobial activity against gram-positive and gram-negative bacteria showed acceptable fastness and antibacterial properties.

**Keywords: Antimicrobial properties, Dyeing, Extraction, Mordant, Silk, Thespesia populanea.**

**0501071 THEJASWINI, M.L.; RAO, H. G. RAMACHANDRA; PURANIK, D. B. AND KUMAR, ARUN H (Department of Dairy Technology Dairy Science College, Hebbal, Bengaluru)-NUTRIENT AND EXTENDED LIFE RAGI AND RICE FLOUR BLENDED EXTRUDED PRODUCT-AN HOLISTIC FOOD IN A DESIGNER WAY**

Though India is number 1 milk producing country in the world, its contribution to world trade is negligible. The gap can be bridged by value addition and product diversification. Today's consumers are increasingly seeking 'functional' foods for their health and well being as means of nutritional intervention in disease prevention. Dairy products enriched with the health attributes of functional ingredients such as breakfast cereals would be safe and viewed as potential novel foods for health promotion (Pal, 2007). Thus from the time the extrusion cooking process was introduced for food application, preparation of cereal and starch based products has been the major use. Initially, the extrusion cooking was used for the production of breakfast cereals as cereal flakes to replace the traditional process of making cereal flakes from maize grits, but now a days, later the extrusion cooking process was used for preparation of various cereal based products such as expanded, fortified and enriched, shaped cereal, precooked, instant cereal, infant, weaning and baby foods (Linko *et al.*, 1992). Keeping in view of all above factors, the present study aimed to prepare, milk and cereal based noodle like products with the enrichment of Sodium Caseinate with the following objective.

Effect of different packaging materials and modified atmospheric packaging on physical parameters of ragi and rice flour blended extruded product stored at room temperature (28°C) with the incorporation of sodium caseinate.

**0501072 VENKATESH, C S, MURTHY, M. MAHADEVA; SHANKARA, M.H AND SANJAY, M T (Department of Forestry & amp; Environmental Science, GKVK, University of Agricultural Sciences, Bangalore-560065). COMPARISON OF MICROCLIMATE VARIATIONS IN SWAMPY AND NON-SWAMPY AREAS OF KARNATAKA**

Literature survey was conducted to know the variations in the swampy and non swampy area in Karnataka to understand the micro climate conditions. Further, through primary field survey the variations reported were validated in the selected locations. The microclimatic variations with respect to pH, water level, slope, etc were considered in the present study. Swampy areas were characterized by presence of water logged condition, consisting *Gymnacranthera canarica*, *Myristica fatua* var. *magnifica* Myristicaceae species, prominent with knee / aerial roots, in summer season having wet condition, More acidic, poor in NPK but rich in Fe & amp; Zn, large proportion of humus, presence of anaerobic bacteria and relatively flat slope. non-swampy area was characterized by, consisting *Myristica malabarica*, *M. dactyloides*, *Knema Attenuate* Myristicaceae species, Prominent with aerial roots observed, in summer season having dry condition, less acidic, relatively rich in NPK & amp; poor in Fe & amp; Zn, less proportion of humus, absence of anaerobic bacteria and relatively sloppy upland.

**Key words: Micro climate, Swampy area, Non-swampy area**



## 02. ANTHROPOLOGY

### 0502073 BANERJEE, GAUTAM (Bidhan Chandra College. Asansol, West Bengal)-SABKE SATH SABKA VIKASH' AND TRIBAL DEVELOPMENT OF NORTH EAST INDIA: A PANGLOSSIAN COUNTENANCE

This paper is based on two arguments. Firstly, is development (Vikash) possible without peace in the region? And secondly, as tribal lives are completely different from ours shall we leave the tribal alone so that they can preserve their own identity and culture. Tribal modes of feeling and reasoning are unfamiliar and their world is alive with magic, mystery and superstition. But the question arises; can a welfare state like India permit the neglect of any section of the population, and accept the vacuum of administration in North East? Is it not better to 'civilize' them at the earliest? When it is found their life is full of struggle, and they lack many of the amenities of modern-day life, can they be left in their age-long isolation?

India is a home to over 54 million naturvolkers (1981) of which over 6 million (4.4 million in 1971) are in North East, divided into 213 tribal communities and they have lived for centuries in the remote parts of the country. Out of 5653 communities in India, 653 are tribal of which 213 are found in the North East. The Scheduled Tribe (ST) account for 53.6 millions of which 5.6 million were in North East that is 10 per cent of India's ST population.

More than seventy years, the tribal people of the North East are living in a state of turmoil caused by 'insurgency', 'militancy', 'secessionism', 'terrorism' and 'violence'. As a result of which the common people have suffered. Causes of insurgency or turmoil in different states of the North East are different. Several groups clashed with each other on the ground of conflicting objectives and interests. When some wants 'independence' and some 'autonomy' and 'special power'. When Government wants to do their best, many political leaders have taken up the issues of economic backwardness, protection of rights, culture and interest of tribal people and exploitation by the 'civilized' outsiders.

The second school of thought advocates, tribal society invariably leads to a loss of the tribal virtues and rapid assimilation of the vices of civilization. This assimilation or detribalization has serious disadvantages. Its form of progress is by a break with the past and not by evolution. It tends to make the tribal people ashamed of their own culture, language, artistry, religion and certainly creates some sort of inferiority complex which results in a political and social revolt.

The humane approach of the slogan 'Sobka sath sab ka Vikash' which is very much democratic, therefore, requires emotional integration of the people of North East so that they realize that we do not mean to interfere with their way of life but want to help them to live peacefully with the development. But doing this 'within the framework of tribal culture' is a formidable task.

**Key Words: Emotional integration, humane approach, tribal virtue, a vacuum of administration**

### 0502074 GHRITLAHRE, MANISHA (Department of Anthropology and tribal Development, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh)-ASSESSMENT OF NUTRITIONAL STATUS OF ICDS CHILDREN AGED FROM 2-5 YEARS OF BILASPUR, CHHATTISGARH

Malnutrition in children is a silent emergency leading to almost seven million child deaths (approximately 55% of all child deaths) annually. India has the highest percentages of malnutrition among preschoolers that's why it is very needed to pay special attention towards them. Nutrition plays a key role in physical, mental and emotional development of children. Countries throughout the world are at various stages at nutritional transition, food insecurity and undernutrition exist side by side with problems of over-nutrition, obesity and chronic diseases. The cross-sectional study was conducted among 500 children aged from 2-5 years of Bilaspur, Chhattisgarh. Objective of the study is to assess the nutritional status among ICDS children. Purposive sampling technique was used. Anthropometric measurements and Socio-economic factors were collected for the study. Proper nutrition in

childhood is considered as to play a crucial role in the physical, mental and emotional development of children through to their later adult age. At the grass root level, various services to target groups is given at the Aganwadi Center like Pre-school education, supplementary food, immunization, and growth monitoring for the betterment of children but it has been found that implementation of services under ICDS centers are not up to satisfactory standards and still more efforts are needed for improving the quality of services for the successful achievement of expected targets.

**Key Word: Children, ICDS, Nutrition, Undernutrition.**

**0502075 LAKSHMINARAYANAN, SRINIVASAN (Department of Anthropology, University of Madras, Chennai)-THE ROLE OF CLIMATIC CONDITIONS AND SEASONAL CYCLES ON FORMATION OF CULTURAL BELIEF SYSTEMS AND SOCIO-CULTURAL ECONOMIC GROWTH**

Natural Environment and Seasonal Cycles play a vital role in nurturing and shaping cultures. The Winter Solstice is an Astronomical-Seasonal event which occurs twice every year when the tilt of one of the Earth's poles has its maximum degree away from the sun. The North Pole has its maximum tilt away from the Sun during the month of December every year. For the people living in the Northern Hemisphere this marks either the start of the winter, middle of the winter or the end of the winter depending on their proximity from the North Pole. For the Regions located closer to the North Pole i.e. Tundra and Arctic Regions this marks the start of proper winter. For regions mid-way between the North Pole and the Equator i.e. Temperate Regions this marks the progress into the middle of winter. For Regions in Northern Hemisphere closer to the Equator but away from the North Pole i.e. Sub-Tropical Regions this event marks the End of the winter. With the human evolution entering prehistoric times, the science of marking seasons using the positions of the Sun, Constellations of stars in the sky developed indigenously across world cultures. These were very important for the Socio-Economic growth of the cultures because with the right mapping of seasons across the year, proper planning of farming, cattle rearing, and economic and domestic life was made possible and with it progressed each Cultures resulting in the beginning of complex civilizations across the world. Hence these seasonal events were held very sacred which led to the formation of festivals, rituals, deities and mythologies connected with the Solstice events. In this paper, the event of Winter Solstice in the Northern Hemisphere is used to study of the effect of the Natural Environment and Seasonal Cycles on the formation of rituals, festivals, deities and mythologies and on the Socio-cultural-economic growth of cultures. In this paper, the event of Winter Solstice in the Northern Hemisphere to the study of the effect of the Natural Environment and Seasonal Cycles on the formation of Cultural Belief Systems and Socio-Cultural Economic growth.

**0502076 SURESH, K. P. AND SUBASH, V. S (Directorate of KIRTADS, Chevayur P.O. Kozhikode-17, Kerala)-INDIGENOUS KNOWLEDGE, ECOLOGY AND CULTURE: A STUDY OF THE KURUMBAR COMMUNITY OF KERALA**

In Kerala there are thirty six Scheduled Tribe (ST) communities. Major tribal concentration areas are Wayanad, Idukki, Attappady and Kasaragod. Five ST communities are categorized as Particularly Vulnerable Tribal Groups (PVTG). Kurumbar is one of the PVTG community living near the Silent Valley Wild Life Sanctuary of Kerala. As per the 2011 Census the population of Kurumbar is 2586.

Kurumbar community is practicing slash and burn cultivation still now in various Ooru (Settlement). Their knowledge of flora and fauna of the area is very rich. They too have good knowledge of agriculture, ecology and ethno-medicine. Their agricultural operations commences in the in the month of Feb-March. They have systematic socio-political functionaries viz, the Oorumoppan, Kuruthali, Bandari and Mannukkaran in each settlement. The Mannukkaran is the soil and climate expert. The decisions are made in the selection of agricultural plot and allotment it to individual families. *Ragi, chama, thuvara, amara, cholam, thina* are the crops sown firstly in the *Panchakadu* (shifting cultivation) soon after the ritual celebrations. They sown different varieties of millets and legumes are cultivated in the field.

This paper focuses on the indigenous knowledge and ecology of Tribal communities. Anthropological research methods are used in the study.

## 03. ARCHAEOLOGY, HISTORY AND CULTURE

**0503077 AYDHKA, M (PGDA Pandit Deendayal Upadhyay Institute of Archaeology, ASI, Greater Noida)-  
TECHNOLOGICAL DEVELOPMENT OF STONE TOOL ANALYSIS**

The analytical methods of stone tools have their own aspect of history that elucidate the stages of development which were the product of critical observations, bringing out the new archaeological perspective each time. The methodology, therefore, includes a wide range of variations that could be placed under the chronological order of development – the traditional conventional method up to the incorporation of various sciences and technology in them, both subjective and objective. The evolution of new ideas in the analytical process, whether borrowed from other fields or indigenous, proves itself to be better than the previously existing methods holding its own pros and cons, because of the lack of linear uniformity among the artifacts.

**0503078 CHOWDHARY, KANHAIYA LAL (Department of History, Bhagwant University, Ajmer,  
Rajasthan) mRrjk/;;u lw= ,oa /kEein dh rgyukRed v/;;u**

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ds vkpkj&n'kZuksa dk rgyukRed v/;;u\* uked 'kks/k& izcU/k esa rhuksa /kkfeZd ijEijkvksa ds vkpkj&i{k dk rgyukRed v/;;u miyC/k gS] vkSj bl izlax esaa fo}ku ys[kd us nksuksa foosP; xzUFkksa esa fopkj&lKE; ,oa xkFkk&lKE; dk Hkh mYys[k fd;k gSA ijUrq /kEein vkSj mRrjk/;;ulw= dk rgyukRed n`f"V ls v/;;u vHkh visf{kr gSA rgyukRed v/;;u ls ;g Li"V gks tkrk gS fd nksuksa xzUFkksa esa fo"k;] mfDr;ksa ,oa dFkkudksa dh n`f"V ls vR;f/kd lKE; gSA bl lKE; dk ewy vk/kkj ;gh gks ldrk gS fd nksuksa xzUFk Je.k&ifjoktd&ijEijk ls fu%l`r Fks rFkk ,d gh okrkoj.k] dky vkSj {ks= esa fufeZr gq, FksA bu nksuksa xzUFkksa esa izklr lkexzh ds vk/kkj ij ckS) rFkk tSu/keZ dk rgyukRed foospu izLrqr djuk eq>s b"V gSA

ckS) rFkk tSu nksuksa /keZ lkalkfjd thou eas nq%[k dh loZO;kidrk Lohdkj djrs gSa vkSj nq%[k&foeqfDr dk vkn'kZ j[krs gSaA mRrjk/;;u esa vfou'oj lq[k dh izkflr ds fy, psru vkSj vpsru ds la;ksx vkSj fo;ksx dh vk;/kfRed izfØ;k dk IE;d~ Kku vko';d crk;k x;k gSA bl izfØ;k dks tho] vtho] vklzo] cU/k] laoj] futZjk] eks{k] iq.; rFkk iki ds }kjk O;Dr fd;k x;k gSA fgalkfn v'kqHk dk;ksZ ls vtho ls tho dk cU/k gksrk gS vkSj vfgalkfn 'kqHk dk;ksZa ls tho eqDr gksrk gSA dqN blh izdkj ds IR; dk lk{kRdkj~ cq) us Hkh fd;kA ;fi os psru&vpsru nzO;ksa dh fuR; IRrk esa fo'okl ugha djrs Fks vkSj vfuR;rk] vukRer rFkk nq%[k dks lkalkfjd thou ds iz/kku y{k.k ekurs FksA mUgksaus vius LokukHkwr Kku dks prqjk;Z IR;ksa ds :i esa O;Dr fd;k % nq%[k] nq%[kleqn;] nq%[kfujks/k rFkk nq%[kfujks/k&ekxZA nq%[kfujks/k ds fy, ftu mik;ksa dks /kEein esa cryk;k x;k gS os gh izk;% mRrjk/;;u esa Hkh gSa] vUrj bruk gh gS fd tgi ckS)&n'kZu uSjkRE; ij tksj nsrk gS ogk; mRrjk/;;u mifu"knksas dh rjg vkRek ds ln~Hkko ij A mi;qZDr pkj ckS) IR;ksa dh rgyuk mRrjk/;;ulw= dh tSu rRo&kstuk ls fuEu :i esas dh tk ldrh gS % /kEein dk nq%[k&rRo mRrjk/;;u ds cU/ku&rRo ls] nq%[k&gsrq vklzo ls] nq%[k&fujks/k eks{k ls vkSj nq%[kfujks/k&ekxZ ¼v"Vkf³~xdexZ½ laoj vkSj futZjk ls rgyuh; gks ldrs gSaA

nksuksa xzUFkksa esa izklr fpRr] vizekn] d"kk; rFkk r".kk vkfn euksoSKkfud rF;ksa dk foospu gSA lk/kkj.k :i ls ftls tSu&ijEijk ^tho\* dgrh gS] ckS) yksx mlh ds fy, ^fpRr\* 'kCn dk iz;ksx djrs gSaA muds fy, fpRr dksbZ fuR;] LFkk;h] LorU= inkFkZ ugha gSA fpRr dh IRrk rHkh rd bfUnz; rFkk xzká fo"k;ksa ds ijLij ?kkr&izfr?kkr dk vflrRo gSA T;ksa gh bfUnz;ksa rFkk fo"k;ksa ds ijLij ?kkr&izfr?kkr dk vUr gks tkrk gS R;ksa gh ^fpRr\* Hkh leklr ;k 'kkUr gks tkrk gSA ckS)/keZ esa fpRr] eu vkSj foKku dks izk;% ,d gh vFkZ dk ekuk x;k gSA tSu&n`f"Vdksa.k ls ftlds }kjk euu fd;k tkrk gS og eu gSA mRrjk/;;u ds vuqlkj eu Hkh ,d izdkj dk nzO; gS ftlds }kjk lq[k&nq%[k dh vuqHkwfr gksrh gSA nwljs 'kCnksa esa bfUnz;ksa vkSj vkRek ds chp dh dM+h eu gSA /kEein ds ^fpRroxZ\* esa fpRr ds Aj fo'ks"k :i ls izdk'k Mkyk x;k gSA ^euks iqCcaxek /kEek\* ¼eu lHkh izo`fRr;ksa dk vxqvk gS½ vkSj ^QUlua piya fpRra\* ¼fpRr {kf.kd gS] papy gS½ rFkk mRrjk/;;ulw= ds ^e.klekqkj.k;k,.ka ,xXxa t.k ;b\* ¼eu dh lek/kkj.kk ls tho ,dkxzk dks izklr gksrk gS½ rFkk ^e.kks lkgflvksa HkkSeks nqV~BQLiks ifj/kkobZ\* ¼eu gh lkgfld] Hk;adj] nq"V v'o gS] tks pkjksa rjQ nkSM+rk gS½ tSlS okD; nksuksa xzUFkksa esa eu ds Lo:i dks HkyhHkkafr Li"V djrs gSaA oLrqr% eu O;fDr ds vUrjax esa ,d izdkj dk lk/ku gS ftlds }kjk og cká lalkj dks xzg.k djrk gSA eu dksbZ lkekU; bfUnz; ugha gS] oju~ bls psruk ds :i esa Lohdkj fd;k x;k gSA lkekU;r;k le; dk vuqi;ksx ;k nq;i;ksx u djuk ^vizekn\* gSA /kEein rFkk mRrjk/;;ulw= esa ^vizekn\* dk fo'kn foospu gSA /kEein esa izekn dks

e`R;qrqY; rFkk vizekn dks fuokZ.k dgk x;k gSA mRrjk;;ulw= esa izekn dks deZ] vklzo vkSj vizekn dks vdeZ] laoj dgk x;k gSA izekn ds gksus ls euq"; ew[kZ vkSj vizekn ds gksus ls if.Mr dgk tkrk gSA vkRek dks efyu djus okyh leLr Hkkouk,a] okluk,a d"kk; esa xfHkZr gSaA Øks/k] eku] ek;k vkSj ykSHk:ih Hkkouk,a lcls vf/kd vfu"V o v'kqHk gSA mRrjk;;u esa bu pkjksa dks d"kk; dh laKk nh x;h gSA /kEin esa d"kk; 'kCn dk iz;ksx nks vFkkZs esa gSA igyk tSu ijEijk ds leku nwf"kr fpRr&o`fRr ds vFkZ esa rFkk nwllk laU;Lr thou ds izrhd xs#, oL=ksa ds vFkZ esaA /kEin esa d"kk; 'kCn ds vUrxZr dkSu&dkSu nwf"kr o`fRr;kj vkrrh gS budk Li"V mYys[k rks ugha feyrk] ijUrq bu v'kqHk fpRro`fRr;ksa dks nwj dj lk/kd dks buls Åij mBus dk lans'k fn;k x;k gSA mRrjk;;u esa bu pkjksa dk fo'kn o.kZu gSA

**0503079 FAROOK, MUSTHAFA P (Department of History, S.S. College, Areekode-Kerala)-CONVERSION AS RESISTANCE AND LIBERATION: CASTEISM AND THE FORMATION OF MUSLIM COMMUNITY IN KERALA**

The religion of Islam has reached Kerala, the southern tip of Indian subcontinent, by the first century of its rise in Arabia. The rest of India experienced this creed at least two centuries after the advent of the first Muslim missionary group reached Kerala coast. The location of Kerala on the main route of the Indian Ocean trade during the early centuries of the Christian era was the favourable factor for the advent of Islam in the land. The Arabs, who carried out the overseas trade between the Eastern World and the West, frequented Kerala coasts and made there temporary settlements as part of their professional activities. These Arab traders were responsible for the introduction of Islam in the land.

The earliest account of the Muslim community of Kerala is that of the African traveler Ibn Batuta in fourteenth century. Many inscriptions of the ninth and tenth centuries A.D mentions about the influence of the Muslims in the social and economic affairs of the land. However, the social formation of the community- *Mappilas*- is believed to have started from 12<sup>th</sup> century onwards. By this time Muslim settlements, with a mosque as the centre of their social life, were established from Quilon in the south to south Canara in the north. After the encounters between the Portuguese and the Muslim traders many Muslims went to the hinterlands where the Muslims swelled in number. In 18<sup>th</sup> and 19<sup>th</sup> centuries the number steadily increased and by the period of Independence of India, they became a major section who could exert much influence in the socio-political life of Kerala.

The evolution of Muslim community in Kerala is the product of various socio- cultural and political factors. The community is composed of two social groups: (1) the immigrants from the Arab lands, and (2) the converts from Hindu religion. The immigrants were few in number and most of them married native women, and these immigrants and the progeny in their new relationships were the early Muslim community in the land. The second section, the largest, is the converts to Islam from the native Hindu religion who embraced the new faith due to social, economic and political reasons. Majority of them got converted to Islam in order to escape from the social discrimination caused by the caste system. The social restrictions, pressures, taboos and various kinds of hardships compelled them to seek for an alternative. The comparatively better status the Muslims enjoyed in the society attracted them, and they were eager to follow their path. The noticeable aspect of this conversion was that most of the proselytes accepted the new faith not because they were convinced of its doctrinal aspects, but of its emphasis on egalitarian principle that would deliver them from the hardships and hazards they confront in life. Thus conversion became a kind of resistance against their oppressors and a way of liberation from their social sufferings.

**0503080 GAUTAM, SHRIYA (MSt in Archaeology, University of Oxford)-THREATS OF NATURE-HUMAN INTERACTION TO ARCHAEOLOGY: A CASE STUDY OF BHIMA DEVI TEMPLE, PINJORE, NORTH HARYANA**

Archaeological sites are often under significant threat from both nature and human interactions. Natural factors, such as the location of a site on a seismic zone or a flood-plain, close proximity to water bodies, combined

with environmental damage on account of microbial and plant growth are causes of significant concern with respect to conservation of a site. These factors, combined with human factors such as afforestation, urbanisation and construction of roads and houses close to the site compound the problems pertaining to conservation of the site as well as reduce the future scope of excavations. The purpose of this paper is to examine the threats posed by such factors as listed above on the site of Bhima Devi Temple, a *Gurjara-Pratihara* temple complex, which was studied by the author with respect to conservation issues between June 2015 to June 2018. The paper takes into account a complete assessment of the site and attempts to provide remedial solutions for the problems highlighted.

**Keywords:** Archaeology, Gurjara Pratihara, Temple Architecture, Conservation, Vulnerability, Nature-Human Interactions

**0503081 HASKERALI, E.C (SS Science College, Areekode, Ugrapuram Post, Malappuram)-  
STRATIFICATION AMONG THE MUSLIMS (MAPPILAS) OF MALABAR: ANALYSIS OF  
SOCIOLOGICAL CAUSES AND HISTORICAL FACTORS**

Caste System is a unique social phenomenon in the history that distinguishes the Indian society from human societies of the rest of the world. While usually social divisions are decided on the basis of the work, economic status or political power, in caste system one's social status is determined on the basis of his birth. His position in the social hierarchy decided not by his choice, but caste of his parents. He cannot move upward in the social ladder whatever economic or political gains he attain. An individual born in a particular caste lives in the same social grouping till his death. From the view point of religion it was the Hindu religion that endorsed this particular social system and many of the Hindu religious rituals and practices were organized on its basis.

Semitic religions, especially Islam vehemently oppose casteism or social position on the basis of birth. Faith and fidelity is the only criterion for one's esteemed or execrated status in Islamic society. However, Muslim community in Malabar perform many caste practices though they may raise ideological battle against them. The factors for the growth of the Muslim community-Mappila community is one of the reasons for the prevalence of the system among them. The Arabs who reached here for trade activities were propagators of Islam in Malabar. While the Hindu native population got converted to Islam due to their propagation and encouragement by the native rulers they retained some of their old customs. The degraded status of Maapila barbers and Mappila fishermen are the examples. This paper tries to make an analytical study of the factors which led to the social stratification of the Muslim community in the land. Attempt has been made to analyse the social reality in contrast to the dogmas and injunctions of the Quran. The study is based on personal interviews, social surveys and archival research. And the paper concludes with the findings that the casteism and caste based social customs and values once practiced have crept into the Mappila community after their conversion into anti-caste religion.

**0503082 HEGDE, RADHIKA (History of Medicine Department, St Johns Medical College, Bangalore)-  
GANDHI ON WOMEN'S HEALTH (1917-1947)**

Mahatma Gandhi's concern for good health as essential for 'swaraj' (self rule) comes out strongly in his writings. He wanted a healthcare system that had the welfare of the 'public' in mind. As a political philosopher, he strongly believed in specific roles that men and women would fulfill in the new India. His ideology relating to womanhood evolved over a period of time and was shaped by his intimate knowledge of the social realities in the country where patriarchy and caste determined the low status of women, and artificially created famines led to nutritional deficiencies effecting a large number of pregnant women and children. It is in this context that he actively participated in fighting for women's rights, as he believed that only with equal rights and empowerments could women be the agents of social change and the goal of social justice attained. Motherhood played an important role in

Gandhi's concept of womanhood and it is here that he started the Kasturba National Memorial Trust in 1945. The aim of the trust was to promote education, health, social welfare of women and children in the villages of India. This paper examines the writings of Gandhi on health and womanhood that supports the idea of sympathy,

care and attentiveness to women's issues that contributed to the setting up of the Kasturba Trust- a pioneer in providing primary healthcare in India.

**0503083 HORE, BRATATI (S.N.College for Women Kolkata, West Bengal)- SECONDARY TEACHERS' MOVEMENT IN 1954: WEST BENGAL, A CASE STUDY**

All Bengal Teachers Association is widely known name in the history of education in West Bengal. Since the inception of 20<sup>th</sup> century, the teaching community organized one association mainly for the struggle for existence. They realized the patent fact that their demands only would have been fulfilled through strategic change of education.

For what sake, had the association been conceived? The answer was –'this happened as a result of freedom movement. If it is not, why should we, the oppressed & exploited community, set up an organization being unified hand to hand against waywardness of managing committee intending only for security of the service of teachers & poor salary '? The brutality of the subject was comprehensibly manifested in the enquiry report of university.

There winked a clear signal of radical change in political arena. In 1948, a 'symbolic strike' marked middle classed teachers' movement which was used as the right way in right time to lay the foundation stone of bridging the labour movement. Since this working agenda, teachers' strike was directed the conscious thought of the association towards a new dimension being introduced by name of 'cessation of work' with the aim to inform the general masses & authority what helpless, miserable & deprived condition was being faced by the teachers.

In 28<sup>th</sup> conference at Chinsurah, 1953 conclusive decision was firmly adopted that secondary teachers' community would be compelled to stop their teaching unless their demands including salary hike were accepted. The demand for education for the first time was accompanied by the demand for teachers' remuneration. It was clearly stated that, 'teacher's demand is demand for education; demand for education is demand of the nation and through the demand of the nation, teachers too will find their place'.

On 16<sup>th</sup> February 1954, Calcutta witnessed a mammoth demonstration of 10000 people – among them were the leaders of opposition parties, students, labors & others; thereby the teachers movement took the shape of mass movement. Centering round the teachers' procession towards legislative Assembly, arrest of teachers due to the accusation of 144 Cr.P.C. the streets of Calcutta had turned into war field. Military was called. Not only in Bengal, but protest was registered from all over the country including outside condemning the incident in Calcutta. Everywhere there extended the perception that flag of democracy, specially neglected educational infra structure must have to be hoisted by general masses.

The fight of teachers' movement successively reached Legislative Assembly and Parliament in 1954. The movement of 1954 brought a new inspiration to all teaching staffs in every level. The demand of education turned into national demand. The teachers, as if would have started the new role to play as the creator of the nation. Before movement, only one-seventh part of state budget had been allotted for education purpose but due to the relentless fight it finally reached to 13.4 %.

**0503084 JAKHAD, MAHESH KUMAR (Department of Indian History and Culture, Rajasthan University, Jaipur)- शहरीकरण का भाषा और संस्कृति पर प्रभाव का अध्ययन**

देश की स्वतंत्रता के उपरान्त, देश की आर्थिक स्थिति में सुधार होने के साथ ही देश की सभ्यता और संस्कृति में परिवर्तन हुए | देश में औद्योगिकीकरण और शहरीकरण के कारण आर्थिक विकास हुआ जिसके फलस्वरूप परम्परागत कृषि-संस्कृति का विघटन प्रारंभ हुआ और शहरी संस्कृति का विस्तार हुआ | शहरों में आर्थिक सम्पन्नता बढ़ने से परम्परागत सांस्कृतिक मूल्यों-मर्यादाओं का ह्रास प्रारंभ हुआ | पारिवारिक, सामाजिक, नैतिक मापदण्ड परिवर्तित होने लगे | शहरी संस्कृति के विकास के साथ सामाजिक जटिलताएं बड़ी संयुक्त परिवार की संस्कृति का ह्रास प्रारम्भ हुआ है | नगरीय जीवनयापन और मनुष्य की आवश्यकताओं में वृद्धि होने से मनुष्य तनावग्रस्त और कुण्ठाग्रस्त रहने लगा है | यौन-



सम्बन्धों की नैतिकवादी पारम्परिक धारणा में परिवर्तन हुआ है। सामाजिक सम्बन्धों में औपचारिकता बढ़ी है। अतः व्यक्तिवाद की वृद्धि हुई है। मनुष्य अपने तक ही सीमित होकर रह गया है। दूसरी ओर, आर्थिक प्रगति के कारण, सामाजिक जीवन को जड़ता प्रदान करने वाली कई मान्यताएँ टूटी हैं और कई नई सामाजिक मान्यताओं का प्रादुर्भाव हुआ है।

किसी भी समाज और देश के लोगों की जीवन-शैली, जीवन-स्तर, रहन-सहन, खान-पान, आचार-विचार, भाषा, **बोली**, सामाजिक मान्यताएँ और धार्मिक परम्पराएँ आदि सभी वहाँ के सांस्कृतिक परिवेश में निहित होती है। एक कवि/साहित्यकार जिस सांस्कृतिक परिवेश में जीवनव्यापन करता है, उससे उसका जीवन, उसकी विचार धारा और उसका काव्य/साहित्य सृजन प्रभावित होता है। गावों में रोजगार और शिक्षा के साथ-साथ बिजली, आवास, सड़क, संचार, स्वच्छता जैसी बुनियादी सुविधाओं के चलते शोषण और उत्पीड़न से तंग आकर भी बहुत से लोग शहरों का रुख कर लेते हैं।

**शहरीकरण** के फलस्वरूप शहरों में विभिन्न **भाषा** समूह के लोगों का संकेन्द्रण होता है, भाषाई आदान-प्रदान होता है, लेकिन वे ग्रामीण जिन्होंने शहरों की ओर पलायन किया है उनकी स्थानीय भाषाएँ विलुप्ति की कगार पर हैं। भारत में दो प्रकार की भाषाएँ विलुप्त हुई हैं, एक तो तटीय इलाकों के लोग **'सी फार्मिंग'** की तकनीक में बदलाव होने से शहरों की तरफ चले गये। उनकी भाषाएँ ज्यादा विलुप्त हुई। दूसरे **डीनोटिफाइड** कैटेगरी है, **बंजारा** समुदाय के लोग, जिन्हें एक समय अपराधी माना जाता था वे अब शहरों में जाकर अपनी पहचान छुपाने की कोशिश कर रहे हैं, ऐसे 190 समुदाय हैं जिनकी भाषाएँ बड़े पैमाने पर लुप्त हो गई है। हर भाषा में पर्यावरण से जुड़ा एक ज्ञान होता है। जब एक भाषा चली जाती है तो उसे बोलने वाले समूह का ज्ञान लुप्त हो जाता है, जो एक बहुत बड़ा नुकसान है क्योंकि भाषा ही एक माध्यम है जिससे लोग अपनी सामूहिक स्मृति और ज्ञान को जीवित रखते हैं।

भाषा का सीधा-साधा लगाव उस क्षेत्र के **संस्कृति**, परिवेश, अस्मिता, खान-पान रहन-सहन से है। भाषा अपने आप में प्रतिबिम्ब है। लुप्त हो रही भाषाओं पर सिर्फ चिंता व्यक्त न करके हमें चाहिए की ऐसी भाषाओं को सृजनात्मक तरीके से आत्मसात करें लुप्त हो रही भाषाओं के कारण ही देश-दुनिया में सामाजिक प्रभुत्व खंडित हो रहा है। भाषा संरक्षण के लिए वैचारिक पहल की आवश्यकता है। भाषा बचाने का मतलब है की भाषा बोलने वाले समुदाय को बचाना। ऐसे समुदायों के घुमन्तु समुदाय हो, पहाड़ी इलाकों, मैदानी और शहरी सभी समुदायों के लोगों के लिए अलग योजना की जरूरत है। बहुत से लोग **शहरीकरण** को भाषाओं के लुप्त होने का कारण मानते हैं, लेकिन मेरे हिसाब से **शहरीकरण** भाषाओं के लिए खराब नहीं है। शहरों में इन भाषाओं की अपनी एक जगह होनी चाहिए। बड़े शहरों का बहुभाषी होकर उभरना जरूरी है। आदिवासियों के बीच काम करते हुए इन्हें सहेजने की दिशा में काफी प्रयास करने की जरूरत है बोली के साथ ही उसके परम्परागत ज्ञान को सहेजने की कोशिश करनी चाहिए। लेकिन भाषा विज्ञानी **ग्रियर्सन** के बाद बीते 100 सालों में बोलियों या भाषाओं का बड़े स्तर पर सर्वेक्षण नहीं हुआ। किसी भी समाज की भाषा उस अंचल की रीढ़ होती है। भाषा सिर्फ अभिव्यक्ति का साधन ही नहीं होती बल्कि उसमें इतिहास और मानव विकास क्रम के कई रहस्य छिपे होते हैं। **बोली** के नष्ट होने के साथ ही जनजातीय संस्कृति, तकनीक और उसमें अर्जित अर्जित बेशकीमती परम्परागत ज्ञान भी तहस-नहस हो जाता है। बाजार, रोजगार और शिक्षा जैसी वजहों से जनजातीय बोलियों में बाहर के शब्द तो प्रचलित हो रहे हैं लेकिन, उनकी अपनी मात्रभाषा के स्थानीय शब्द प्रचलन से बाहर हो रहे हैं। **शहरीकरण** के इस सांस्कृतिक अवसान के संरक्षण की अत्यन्त आवश्यकता है।

भाषा बचाने का मतलब है की भाषा बोलने वाले समुदाय को बचाना, ऐसे समुदाय के लिए जो नए विकास के विचार से पीड़ित हैं, उनके लिए एक **माइक्रो प्लानिंग** की जरूरत है।

**Key Note: बोली, संस्कृति शहरीकरण, भाषा इत्यादि.**

**0503085 KANTHARAJU, V (Department of History, Bengaluru Central University, Bengaluru-560001)-WAR FUND MANAGEMENT IN MYSORE STATE DURING THE SECOND WORLD WAR: A REVIEW**

It is essential to understand, how people of the world responded to war situation. During Second World War all most all countries of the world directly or indirectly participated in the war by sending their men, materials and other resources. India as colony of British, and its Princely States became a part of the War.

Mysore State appreciated as Model State and its ruler Maharaja Krishna Raja Wodeyar IV, as cited 'Raja Rushi' by M. K. Gandhi, because of the overall progress and prosperity of the province. This fame and greatness of Mysore again proved during the period Two Great World Wars, Mysore brought into the company of the Allies, the whole machinery of the princely state was turned into war supporting mechanism and all the resources he State were diverted reserved to war activities. The Viceroy of India requested Indians to support the War, even though state had its own economic problems Rulers and citizens of Mysore responded positively. They felt that a response to the call of Great Britain was the source of pride to the citizens of Mysore and organized the 'War Fund' in the Mysore State. Through this war fund activities started.. The various programs were adopted to call peoples to support the war in their own means of way. State tried to eradicate the war phobia among the peoples and created awareness about panic among the States and its people. The war related programs like organization of the 'National War Front', 'War Fund' and 'Air raid Precaution' were formed in the State, these organizations played vital role in the Warfare activities of Mysore State. Maharaja of Mysore state and people assisted organizing District committees and Taluk committees of War Fund in the State and funded for War purpose the Indian War Committee to the war fields.

In this research paper, an effort is made to bring out the unrevealed information relating to the contribution of Mysore State in the war efforts, with special reference to the War Fund with help of materials from Archives, contemporary journals and unpublished Government Documents.

**Key Words: Princely States, colony, War Fund, National War Front, Warfare.**

**0503086 KUMAR, RAKESH (National Institute of Advanced Studies, Bangalore)-THE DEEP TIME INVESTIGATION OF POLYCHRONIC INDIGENOUS KNOWLEDGE OF HEALING AND POLYTHETIC CULTURE: A DIACHRONIC PERSPECTIVE**

This paper critically examines the possibilities of identifying the medical practices before the documentation of codified medical system like Ayurveda and Siddha by highlighting the diluted concept of indigenous knowledge of health and healing in the archaeological debate of the organic evolution.

**0503087 KUMAR, SANTOSH (Department of History and Culture, University of Rajasthan, Jaipur)-CURRENT SCIENCE OF THE PRE-MEDIEVAL SUPER HERO VEER TEJĀ : A LIVESTOCK KEEPER AND CULTURE PROTECTOR**

Veer Teja or Tejaji could be a Rajasthani folks immortal. Veer Teja was born around pre medieval period in Khadnal, Rajasthan, India. His oldsters, Ramkunwari and Tahar, were Dhailya Jats. Legend has it that Teja died in vikram sawat from wounds received in battle while attempting to rescue a herd of cows that had been distributed throughout a raid by Mer individuals. The story says that while dying he allowed a snake to bite his tongue, that being the sole uninjured space of his body. In return, the snake secure that nobody or animal would die from a bite if they wanted the blessings of Teja.

Veer Tejaji famous fair in Kharnal and Sursura and every village in Rajasthan state place under tree of 'Khejri'. Veer Tejaji affect social & culture of Teja Dance, Teja fair, Algoja Play, & Fad Kala Kuchamni Khyal, Katputali in Rajasthan State.

**When it rains at the end of the Jyeshtha month, Even today the words spoken by Tejaji's mother are sung in the beginning of rainy season in the month of Ashadh:**

*Gājyó-Gājyó Jèth'r Āshād Kanwar Tèja r̄  
Lagtó Hi Gājyó r̄ Sāwan-Bhādwó  
Sutó-Sutó Sukh Bhar Neend Kanwar Tèjā r̄  
Thāródā Sāthidā Beejèi Bājró*

**0503088 MALINI, M (Department of History, Bengaluru Central University, Bengaluru-560001). A STUDY OF THE CULTURAL LANDSCAPE OF BENGALURU CITY**

In the recent years research in cultural landscape with rich heritage has gained importance in the field of cultural heritage conservation and planning, due to the socio-economic and environmental changes that are accruing in the local, national and global levels. Cultural landscapes are landscapes that have been affected, influenced or shaped by human involvement. Most often much attention is given to the tangible heritage such as gardens, architecture, archaeological sites and monuments and not to intangible heritage such as social practices, representation, expression, knowledge, skills or traditions. It is important to consider that both tangible and intangible heritage are interconnected, the former provides the physical support for the latter, while the latter could contribute the preservation and conservation of the former. The intangible heritage is shaped by social practices which are characterised by rules, regulations and local traditions that are kept alive, handed down and transformed in locally specific cultural context. Over the course of many generations, the place or the region will have a clear character and identity which can only be preserved by understanding the interconnections of these practices and traditions. Conceptually linking intangible heritage, cultural landscape and identity provides the basis for a deeper understanding of communities and their interrelationships with the cultural landscape. Through discourse analysis and participant observation methods an attempt is made to identify how the social practices and traditions have undergone changes in order to survive and conserve the sense of place identity for the future generation. This paper aims to make a comprehensive assessment of the dynamic interrelationship between communities and their cultural landscape as they both continuously evolve.

A study of Bengaluru city is undertaken to understand the tangible and intangible heritage and its role in shaping its cultural landscape. The City was founded in 1537CE by Kempegowda and since then different hegemonic groups have played an important role in shaping the city and giving it multiple layers of identity. The establishment of the Cantonment by the British in 1809 and subsequent industrialisation of the city attracted people from the neighbouring states making it a multicultural city. In the 1990's Bengaluru experienced a dramatic socio-economic change with the advent of the liberalization and expansion of the information technology and business process outsourcing industries in India leading to large influx of people from all over India. Despite the various socio-cultural influences over the years the city continues to celebrate the 'Karaga Festival' one of the oldest festivals, the 'Kadalekai Parse' an annual groundnut fair being held since the founding of the city in 1537CE. The city's heritage is also visible in the everyday lives of the people, in different forms of expression such as place names, music and performance arts or in socio cultural life like games, cuisine and other leisure activities. Collectively the landscape of Bengaluru reflects the story of people, events and places through time offering a sense of continuity and also a cultural context for understanding the cultural heritage. It is imperative to understand the interconnection of these local practices and traditions in order to strengthen and reinforce the diverse and varied circumstances that are continuously creating and interpreting the intangible heritage and transmitting it to the future generation.

**Key words: Cultural Landscape, Intangible heritage, Place Identity, Conservation.**

**0503089 MATHEW, TERRANCE (AnjenayaSwamy Temple Street, Marappa Garden, Benson Town, P.O, Bangalore). THE STUDY OF GOTHIC ART AND ARCHITECTURE IN THE MINOR BASILICA CHURCH- BANGALORE**

During the British Crown rule in India from 1858 to 1947, the colonial era was established by the British government. Even today the structures are still in stand. One such Colonial architecture that still remains even today in Bangalore is St Mary's Basilica Church located in the busy area of Shivajinagar. The Church still remains through building and infrastructure in the 'Gothic' style of architecture. The basilica has been constructed with arches, ornamental motifs and stained glass windows. The small chapel was modified and enhanced in 1813. The Church was rebuilt during the years 1856-1882. The current form of the majestic spacious Gothic-style is one of the oldest Roman Catholic Church dedicated to St Mary. It was designed by a French architect and was constructed in the form of a Cross. The main church is 172 feet long and 50 feet broad. The magnificent tower and imposing building forming the facade of the Church is 160 feet high. A 6 feet height beautiful statue of Mother Mary carrying baby Jesus in her arms is the Centre of attraction of the shrine. In order to study the exact styles of architecture in the church the present study was undertaken.

**Keywords: British Crown rule, Basilica church, Gothic-style, stained glass windows.**

**0503090 PURUSHOTHAMA, S (Department of History, Bangalore Central University, Bangalore-560001).  
WRITINGS OF SANJAY SUBRAHMANYAM : A HISTORIOGRAPHICAL REVIEW**

Sanjay Subrahmanyam is a well known historian of South Asian of Medieval period. His studies are unique in view of many respects. Born into a family of Tamil Smarta Brahmins, the intellectual aristocracy of India, he grew up in Delhi and was trained, first in economics, then in economic history, in the remarkably effervescent environment of Delhi University in the early 1980s. He has lived and taught in Lisbon, Paris, Oxford, Los Angeles and Jerusalem to name but a few of the stations.

His early monographical work entitled 'The Political Economy Of Commerce Southern India 1500-1650' based on his doctoral thesis published four years after submitted to the University of Delhi in 1986.

Subrahmanyam worked on Pre-colonial India since the beginning of the age of discoveries down to the period of the colonial set-up started in India. His main focal subjects on the area of trade between Europe and Asia particularly with India ; writing on the Mughal world; voluminous work on 'The Career and Legend of Vasco da Gama' mention a few for samples, due to the constraint of time and space here in abstract but will bring as wider length as possible in full fledged article later on. But one thing certainly must say here regarding his other focal point of his works and the methodology used in.

With wide extensive use of European languages including the materials from Dutch, Portuguese, English, French nad Persian, Urdu and the Vernacular language like Tamil, Subrahmanyam combined internal and external perspectives on questions of political culture, political economy and historiography. In several ways Subrahmanyam's works best represented innovations, expansions and rethinking. Many of his works revisits some old debates and casts new light on them. So Subrahmanyam's research speciality lays in equipped of western archieval materials. Having equipped with western archival materials. Subrahmanyam confronted traditional assumptions and challenge certain enduring beliefs of Indian writer's or historians.

Take for example writing on 'Mughal and Franks', he questions the lines of political and cultural division that traditional history writing has accepted. He demonstrates that the interface and balance of power between the Mughals and the Europeans are an integral part of a wider system of international political alliances. In this way he connected the histories in Eurasia.

Take another example for his new and connected histories approach, his early work 'The Political Economy of Commerce: Southern India 1500-1650', he explores the relationship between long distance trade and the economic and political structure of Southern India in the sixteenth and early seventeenth centuries. He questions the more traditional views that external demand was the force behind pre-colonial Indian economic growth or that external trade was insignificant in quantitative and qualitative terms compared with the vastness of the internal economy. Instead Subrahmanyam authoritatively demonstrates the interaction between South Indian developments

and larger international processes within certain economic institutions- most notably the network of marketing villages, great coastal emporia and operations of revenue farmers and portfolio capitalists.

In the same way Subrahmanyam give new approach in his voluminous work 'The Career and legend of Vasco da Gama. This work is not biographical like one but many wide ranging aspects he brought here. It argues that Gama's Political position in Portugal makes him an unlikely candidate for the role of nationalist hero. However by exploiting creatively the symbolic capital of a legend that existed in his own lifetime, Gama, his descendants and panegyrist (notably Camoes) transformed an obscure nobleman from the Alentejo into the Great Argonaut.

Sanjay Subrahmanyam has also worked closely with the great historian of Mughal India, Muzaffar Alam, with Velcheru Narayana rao, David Shulman and with many others.

**0503091 SINGH, HAR LAL (Department of History and Indian Culture, University of Rajasthan, Jaipur)-  
SACRED PILGRIMAGE SITE OF CULTURAL TOURISM OF SHEKHAWATI REGION  
(SPECIAL REFERENCE TO THE CIRCUMAMBULATION OF MALKETU MOUNT IN  
LOHARGAL)**

Shekhawati region has been a sub-state under the Jaipur state of Rajputana, which was founded by Rao Shekha of Amarsar - Naan in the fifteenth century and later expanded by his descendants. Presently Shekhawati region is spread over Sikar and Jhunjhunu districts of Rajasthan. The Shekhawati region is rich in its glorious history and cultural traditions. Pilgrimage tourism here is a distinct religious lifestyle in these cultural traditions. This region has various pilgrimage sites associated with almost all religions of India, especially Hindu, Muslim and Jainism. There are pilgrimage sites for activities of Hinduism almost all the social religious rituals, fairs and festivals, bathing traditions etc. Here are the various religious Peeth and Ashrama of the creed or sects of Hinduism, Shakti, Vaishnavas, Shaiva, Nath, Dadu, Aghar or Dhunimata, Udasi, Radhaswami and Ramanandi or Rasik sect. In which places are named like Rewasa, Tai, Srimadhapur, Baggad, Fatehpur, Jhunjhunun, Udaipurwati, Sangalia, Lohargal, Beri etc. While the Muslim community has holy shrines of religious peers in Fatehpur and Narhad in special reference to Hazrat Shakkar Peer Baba, the Jain community's different sects nasiyan are located in Sikar, Rewasa and Beri. Where people gather in fairs held on festivals or special occasions.

Lohargal's name is paramount in the cultural tourism pilgrimage of Shekhawati. It is located 10 km west of Udaipurwati town of Jhunjhunu district in the lap of Aravalli. It is a holy pilgrimage site for Hindus. Although, pilgrims keep coming here almost all the time and take bath at Suryakund. But in the fairs held in the month of Shraavan and Bhadrpada, this place gives a feeling of Kumbh Fair. In the month of Shraavana, due to the announcement of Kawadiyas 'Bol Bam Tadak Bam', not only the entire Arawali valley but the whole Shekhawati resonates. At this time the holy water brought from the Suryakund of Lohargal is offered by the Kawadiyas on the 'Shivlinga'. From Goganavami to Amavasya, 24 Kos are circumambulation in Mount Masketu in Lohargal. People of all castes, young and old, men and women participate in this parikrama. The 24 Kosi Parikrama starts from Suryakund and ends at Suryakund after bathing in 9 types of water sources. Among these water sources are Brahma Kund (Gyan Vapi), Karkotak Teertha-Kotishwar Shiva (Kirori), Shakra Teertha, Kuhkund, Naagkund, Tapkeshwara, Shobhawati River, Khurkund and Suryakund. The significance of bathing in these water sources and the circumambulation of Masketu mountain is here the weapons of the Pandavas were dissolved and they were freed from the sin of killing their own. Therefore, people here have been following the same tradition even today. According to Lohargal Mahatmya-

*Lōhārgalasya Argalēv Syāt Pāpānām Sannirodhakam  
Yatrat Lōhārgal Nām Tēértha Guhaytam Bhuvi.  
Lōhārgalasya Gangāyā VaradakhyaMāshramsya Ch.  
Na Bhēdō Hi Bhayā Drishti Vādsatya Chachmi Shaunak.*

That is, like the Iron *Argalā* (Chain), this shrine does not allow sinners to enter the heart, hence this secret shrine is called Lohargal. Apart from this, comparing the water stream flowing from Suryakund of Lohargal to the Ganges originating from Badrikashram, its pride and importance has been demonstrated.

**0503092 SINGH, MOIRANGTHEM SURESH (Department of History, University of Hyderabad, Hyderabad)-TYPOLOGY OF SOILS AND GRAINS MENTIONED IN CHEITHAROL KUMBABA**

The present paper explores the types of soils and grains found in the Royal Chronicle, Cheitharol Kumbaba, and its relevance to the present day. It can be regarded as a historical text which contains the records of events that happened in successive periods from 33 A.D. onwards. Its focus on the political and military activities of the Nigthouja rulers. Moreover, it contains social, economic, cultural, and religious development with changing process and solved the question of what, when, how these happened. It also deals with the effects of many events. It is a famous royal chronicle which records the historical events of two thousand years covering 78 kings of kanglei. One can get lots of information of not only the political development, administrative system, military achievement but also agricultural practices with new methods and techniques, water management by digging canals, dikes and trenches, land reclamation, introduction of new crops agrarian settlement land revenue assessment weaving and dying agriculture salt manufacturing , type of soil. The reign of Khagemab marked the introduction of the transplantation system. A new kid of paddy, Taothabi, suitable for swampy land, was launched. According to reliable sources, it was initiated to keep a proper record of the state income from agricultural products and as the land survey system land measured through a scale known a Sana Lamjei. Land revenue paid in kind. Methodologically, paper falls within the descriptive framework supplemented by other written sources. The paper concludes that the people had the idea of what types of soil, as well as season, were suitable for the cultivation paddy and other crops even if the scientific soil testing techniques were not known.

**Keyword: grains, soils, Cheitharol Kumbaba, Manipur.**

**0503093 YADAV, R. P. (Department of History, R L S Y College, Patna, Bihar)-DEVELOPMENT OF CONSUMER PROTECTION AND WELFARE SYSTEM IN INDIA**

This paper tries to analyse the systematic development of consumer protection and welfare in Indian society since ancient period to modern era. Today, India has world's largest consumers goods and services. Capitalistic system of trade has exploited the honest consumers. According to Mahatma Gandhi, 'the consumer is the king of market.' But, consumers of India have been cheated by unethical, unfair and high price of goods and services. There has been an increasing public concern over the consumer protection issues all over the world.

This article is based on secondary sources. Narrative and Analytical method has been used.

**Key words: Consumer, Development, Democracy, Goods, Services.**

#### **04. BIOLOGICAL OR LIFE SCIENCE**

**0504094 CHANDRASHEKARA, K. T (Institution of Excellence, VijnanaBhavana, University of Mysore, Manasagangotri, Mysuru-560006). INHIBITORY EFFECTS OF BIO-NANO PARTICLE OF CLITOREATERNATEA ON MULTI DISEASES**

Health is pivotal part of wellbeing than any wealth. Diseases caused by many factors in human beings, animals and plants. It is one of the most important factors to achieve the good result for particular disease. It is very much necessary to investigate multi factorial inhibitory products targeting multiple diseases. The current study aimed to investigate the effects of bio-nanoparticle of Clitorea ternatea on aging, cancer, neurodegenerative disease and microbial infections. Using the rotary system, the extracts of plant were concentrated and prepared. Nanoparticles were prepared by using standard method. Results showed desirable anti-aging, anti-cancer, anti-neurodegenerative disease and antimicrobial effects of the bio nanoparticles and the highest effect was observed in bio nanoparticles

and the inhibitory effects were observed. Bionanoparticles used in the study on many diseases inhibited the incidence of the diseases.

**Key Words: Bionanoparticles, Clitorea, multi diseases**

**0504095 DEVARAJU, K S; SAROJINI, R; BULBULE, P; ARAVIND, AND HEMALATHA N (Department of Biochemistry, Karnatak University, Dharwad, Karnataka-580003). P1 AND P2 PEPTIDES AS INHIBITORS AND PHOSPHOPENTAPEPTIDE AS A CANDIDATE SUBSTRATE FOR CALICNEURIN**

Calcineurin (CN) is a protein ser/thr phosphatase known to be involved in learning and memory in the nervous system and T-cell proliferation in immune system. In several transplantation procedures this enzyme has been inhibited by using inhibitors like cyclosporine, FK506 and Trifluoperazine. However there is an auto inhibitory domain (AID-25 aa) in the CN that inhibits the activity of CN to maintain molecular homeostasis. In the current study we have designed and derived peptide fragments from the AID of CN, and are used to measure binding affinity by *insilico* approaches by molecular docking and simulations studies, finally screened for two peptides P1:474-KGLDRINERMPP-485 ( $\Delta G = -5.31.6 \text{ KCmol}^{-1}$ ) and P2: 473-AKGLDRINERM-483 ( $\Delta G = -5.30.5 \text{ KCmol}^{-1}$ ) and further they are used in CN inhibitory assay and found exhibit higher inhibitory property than AID peptide ( $\Delta G = -530.4 \text{ KCmol}^{-1}$ ). In addition we have also developed an CN assay method by employing simple phosphopentapeptide (PPP) derived from PKA RII subunit after having done, molecular docking, synthesis and characterization of PPP employed successfully as a candidate substrate.

**Keywords: Calcineurin, Phosphopeptide, binding affinity, inhibitors, assay method.**

**0504096 DINESH, B. AND MUNIRAJAPPA (Centre for Applied Genetics, Dept. of Zoology, Bangalore University, Bangalore-560056). HISTOCHEMICAL ANALYSIS AND IN VITRO GERMINATION OF POLLENIN JATROPHACURCAS L. (EUPHORBIACEAE)**

The genus *Jatropha* belongs to family Euphorbiaceae and native of Central America, distributed throughout the world with approximately 175 species. *J. curcas* is a medium sized tree, commonly known as Physic Nut or purging nut, but has different vernacular names in the regions of its distribution. The roots, stems, leaves, seeds and fruits of *J. curcas* have been widely used in traditional folk medicine and considered as the most primitive species in the genus. The latex of the plant attracted global importance as potential source of biodiesel and breeding programs among different species of *Jatropha* has been undertaken to develop high yielding hybrids. The present studies aimed to investigate phenology, pollen viability, germination and morphologically characterize the pollen grains in order to expand palynological knowledge of the group and provide additional micromorphological information useful for studies of the relationships within Crotonaceae using Light and Scanning electron microscopy. The results showed that the flowering was observed throughout the year and viability was found to be  $77 \pm 3.86\%$  at anthesis and maximum germination found to be  $89 \pm 3.24\%$  in 15% sucrose and germinated pollen tube length of  $90.56 \pm 3.42 \mu\text{m}$ . The pollen grains were monads, large in size with maximum diameter  $60.24 \pm 6.04 \mu\text{m}$  and minimum diameter  $57.32 \pm 5.34 \mu\text{m}$ , spheroidal in shape, exine surface was heavily sculptured, clavate with very few muri irregularly distributed and free standing micro-clavate, inaperturate exine ornamentation is of crotonoid pattern in general. Thus, the palynological data increases what is known about the morphology and helps in the systematic identification of the species. The Indian Eri silk worm *Antheraea assame* is polyphagous in nature feeding on different food plants including *J. curcas* and practicing North-East in India. It should be considered for large scale plantation under different eri plantation programs to address the scarcity of food plants. Therefore, the need of Eri food plants is required for conservation and understanding of pollen morphology in breeding aspects.

**Keywords: Morphology, Viability, Germination, Exine, SEM.**

**0504097 DIVYA, R; VEERESH, PRASHANTH M; RAVIKUMAR H, PUTTARAJU H. P, SUBBARAO V. AND MADHUNAPANTULA (Department of Life Science, Bangalore University, Bangalore-**

**560056). BIOACTIVE GUIDED FRACTIONATION FROM RUTAGRAVEOLENS LEAF EXHIBIT POTENT ANTI BREAST CANCER ACTIVITY IN VITRO AND IN VIVO**

*Rutagraveolens (RG)*, also known as herb of grace, is an important medicinal plant cultivated in many parts of India. Prior studies have demonstrated the anti-tumor activity of extracts isolated from RG. In addition, few other studies have indicated the lifespan enhancing ability of RG extracts using DLA and EAC tumor bearing mouse models. However, to date, not much is known about the key phytochemicals responsible for RG-induced tumor cell death. More over, the mechanisms by which RG derived extracts exert tumor cell killing are also unknown. Hence, in this study we have fractionated RG leaves using solvents of increasing polarity and fractionated the active extracts using column chromatography. The data demonstrated better killing of MDA-MB-468 breast cancer cell line with hexane (IC<sub>50</sub> at 24h 0.9µg/mL), 70% ethanol (IC<sub>50</sub> at 24h 1.2µg/mL), water (IC<sub>50</sub> at 24h 1.45µg/mL) and dichloromethane (IC<sub>50</sub> at 24h 2.3µg/mL). Analysis of these extracts using reverse phase HPLC (C18 column) demonstrated the presence of gallic acid, syringic acid, coumaric acid and ferulic acid. In vitro migration assays revealed inhibition of cell motility upon treatment of breast cancer cells with these extracts. In mice bearing DLA tumors, the chloroform extract has reduced the tumor volume compared to control group. Further studies determining the changes in cellular architecture, morphology and expression of angiogenic, proliferation and apoptosis markers are currently underway.

**0504098 GAYATHRI, D. S; HARIPRASAD, T. P. N. AND BHARATH, H (BGS Science Academy, Agalagurki, Chikkaballapura-562103). COMPARATIVE STUDY OF DROSOPHILA DIVERSITY BETWEEN GRAPE YARD AND TREE VEGETATION IN CHIKKABALLAPURDISTRICT, KARNATAKA**

The distribution and diversity of *Drosophila* species were analyzed between two diverse vegetations of Chikkaballapura district. The flies were collected all through the year from the month of October 2018 to September 2019 in grape yard and the tree vegetation. A total of 494 flies were collected in grape yard during the study period and 1986 in tree vegetation. The present study showed high species richness and abundance in tree vegetation than vine yard. A total of seven species were documented, among them, four species belonged to the genus *Drosophila*, two species belong to genus *Zaprionus* and one species of *Amiota*. The two species *Z. indianus* and *D. suzukii* were identified as invasive pest around the world. *Z. indianus* was the most abundant and dominant species in both vegetation.

**Keywords:** vegetation, diversity, *Drosophila*, species richness, abundance.

**0504099 KUMAR H. RAVI; DIVYA, R; PUTTARAJU, H P AND MADHUNAPANTULA, SUBBARAO V (Department of Life Science, Bangalore University, Bangalore-560056). EVALUATION OF THE ANTIOXIDANT POTENTIAL OF CAESALPINIADecapetalaleaf EXTRACT**

*Caesalpinia decapetala*, is used as an ornamental or landscaping plant as a hedge around the world. Different parts of plant have been used in the folk medicine and chemical industry. Colorimetric assays from other laboratories have demonstrated the presence of flavonoids and phenolic compounds in *Caesalpinia decapetala* leaves. Preliminary studies using ethanolic extracts of *Caesalpinia decapetala* leaves have reported anti-oxidant and anti-inflammatory activities. However, the compounds responsible for these activities have not been separated and studied to date. Therefore, in this study leaves of *Caesalpinia decapetala* were extracted with solvents of increasing polarity and the antioxidant potential determined using FRAP and DPPH methods. Analysis of the phytochemicals estimation data showed very high total phenols in hexane and chloroform extracts compared to Dichloromethane (DCM), 70% aqueous ethanol and water extracts. Further analysis of these extracts for their ability to scavenge DPPH radicals demonstrated greater ability of Hexane extract over other fractions. Confirming this data further, analysis of these extracts for reducing ferric ions in to ferrous ions showed much better activity with Hexane extracts. In conclusion we demonstrate the fractionation and preliminary characterization of antioxidant phytochemicals from *Caesalpinia decapetala* leaves.



**0504100 KUSHWAH, RAJA BABU S; KAUR, TARANJEET; DYKES, CHERRY L; KUMAR, RAVI H; KAPOOR, NEERA AND SINGH, OM P (National Institute of Malaria Research, Sector 8, Dwarka, Delhi-110075). A NEW KNOCKDOWN RESISTANCE (KDR) MUTATION F1534L IN AEDESAEGYPTI ASSOCIATED WITH INSECTICIDE RESISTANCE**

The control of *Aedes aegypti* borne-infections mainly dengue, chikungunya, yellow fever and Zika virus relies mainly on vector control measures in the absence of specific drugs or vaccines available against these infections. Emergence of insecticide resistance in *Ae. aegypti* may pose serious threat to the success of insecticide-based vector control programme. Here, we report the presence of multiple knockdown resistance (kdr) mutations present in an Indian *Ae. aegypti* population including a new mutation F1534L (not reported earlier in *Ae. aegypti*) which is associated with DDT and pyrethroid resistance. DNA sequencing of partial domain II, III and IV of the voltage gated sodium channel (VGSC) performed in *Ae. aegypti* collected from Bengaluru, India, revealed the presence of four *kdr* mutations, i.e., V1016G and S989P in domain II and two alternative *kdr* mutations F1534C and F1534L in domain III. We didn't find mutations T1520I in domain III and D1794Y in domain IV in this population. Allele specific PCR assays (ASPCR) were developed for the detection of *kdr* mutations V1016G and S989P while a PCR-RFLP based strategy was adopted for the genotyping of all three known mutations in domain III (F1534L, F1534C and T1520I). Genotyping of 572 *Ae. aegypti* samples collected in 2014 and 2015 revealed a moderate frequency of V1016G/S989P (18.27%) and F1534L (17.48%), a relatively high frequency of F1534C (50.61%) and absence of T1520I in the population. Mutations V1016G and S989P were in complete linkage disequilibrium while they were having negative linkage disequilibrium with *kdr* alleles F1534C and F1534L. The new mutation F1534L showed significant protection against permethrin, deltamethrin and DDT whereas F1534C showed protection against permethrin and DDT but not against deltamethrin.

**Key words:** *Aedes aegypti*, insecticide resistance, *kdr*, pyrethroid, voltagegated sodium channel.

**0504101 KUSUMA, C. G; GUBBIVEERANNA, VINOD; SUMACHIRAYU, C. K; BHAVANA, S AND NAGARAJU, S (Department of Studies and Research in Biochemistry, Tumkur University, Tumkur-572103). EVALUATING PROTEOLYTIC ACTIVITIES OF MANILKARAZAPOTA LATEX**

*Manilkarazapota* also known as Sapodilla belongs to the family Sapotaceae. In tropical and sub-tropical regions, the latex of the plant has been used in tribal medicinal practice to arrest the bleeding from minor injuries and to enhance the process of wound healing. Studies have demonstrated the role of proteases from plant latex in hemostasis and the process of wound healing. In this study, we have evaluated *M. zapota* latex role in hemostasis. *M. zapota* latex is assessed for protein banding pattern by SDS-PAGE and proteolytic activity performed using casein as substrate. Inhibition studies were performed using specific protease inhibitors to know the type of protease. Specificities were analyzed for different substrates like gelatin, collagen and fibrinogen. Effect on blood coagulation was performed by recalcification time. *M. zapota* latex has protein concentration of 5 mg/mL and serine protease having specific activity of 2.36 U/mg/mL. It showed substrate specificity for the tested substrates. It exhibited procoagulant activity by reducing clotting time in recalcification time from 143 to 35 sec. This is first report of serine protease from *M. Zapota* latex having procoagulant property.

**0504102 PATTABHIRAMAIAH, MAHESH; RAJARATHINAM, BHARGAVI AND ANANDHI, USHA (Centre for Applied Genetics, Department of Zoology, Bangalore University, Bangalore-560056). INVESTIGATION ON THE ANTI-DIABETIC ACTIVITY OF ALPHA AMYLASE INHIBITORS FROM SELECTED PLANTS AND EVALUATION OF THEIR EFFICACY IN ZEBRA FISH**

Type 2 Diabetes Mellitus has reached epidemic proportions as a result of over-nutrition and increasingly sedentary lifestyles. Managing diabetes and its complications emphasizes an imperative need for safer, more efficient and affordable alternative treatments. Over 1200 plant species are reported in ethnomedicine for treating diabetes and these represents an important and promising source for the identification of novel antidiabetic compounds. The present study investigates the hypoglycemic effect of methanolic leaf extract of three different plants viz., *Anacardium occidentale*, *Manilkarazapota* and *Meliadubia* in alloxan-induced Zebrafish. The GC-MS

analysis of the plant extracts revealed the presence of more than 67 phytochemicals out of which 12 potential anti-diabetic compounds like terpene derivatives and terpenoids, flavonoids and a few sterols were identified. The leaf extract of plants viz., *A. occidentale*, *M. dubia* and *M. zapota* showed in vitro  $\alpha$ -amylase inhibitory activity compared to the standard drug acarbose. The IC50 values showed that *A. occidentale* (IC50  $\pm$  5.0095  $\mu$ g/ml) was more effective in inhibiting  $\alpha$ -amylase in-vitro when compared to the *M. zapota* (IC50  $\pm$  8.4848  $\mu$ g/ml); *M. dubia* (IC50  $\pm$  6.5718  $\mu$ g/ml). The alloxan-induced Zebrafish, treated with methanolic extracts of the plants showed varied hypoglycemic effects at doses of 30, 15, 10 and 5mg/l. The diabetic Zebrafish showed reversal to normoglycemia after oral administration with the plant extract of concentration 5mg/l. Out of the 3 plant extracts, *A. occidentale*(64mg/dl) and *M. zapota*(58.333mg/dl) revealed optimum results in Zebrafish. Docking analysis was done to visualize the stereochemistry binding of the ligands, identified in the GC-MS analysis and the zebrafish  $\alpha$ -amylase enzyme and the analysis revealed that the ligand quercetin had the highest binding affinity to  $\alpha$ -amylase.

**Keywords:**  $\alpha$ -amylase, diabetes mellitus, zebrafish, docking analysis, alloxan, IC50, GC-MS analysis.

**0504103 RAJASHEKARA, S; SRIVASTAVA, ARSHIKA; SUMHITHA, SANKRANTHI AND KUMARI, SWETA (Centre for Applied Genetics, Department of Studies in Zoology, Bangalore University, JnanaBharathi Campus, Bengaluru-560056). IMPACT OF BIOGENIC ZINC OXIDE NANOPARTICLES ON THE BIOMOLECULES - DEOXYRIBONUCLEIC ACID AND ENZYMES**

The biological method of zinc oxide nanoparticles (ZnO NPs) production is an alternative method for physico-chemical methods. Biogenesis of zinc oxide nanoparticles (ZnO NPs) from the methanolic leaf extracts of *Calotropis gigantea* L. (Giant Milkweed plant) was investigated for the DNA fragmentation on the MDAMB-231 cell lines. MDA-MB 231 cancer cell lines were treated with TRizol Reagent for its RNA isolation. Also, the effect of ZnO NPs on Caspases 3 and 8 expression of genes was studied in MDAMB-231 by semi quantitative-PCR method. For the study of apoptotic process,  $\beta$ -Actin was used as controlling factor/and normalization of gene expression. The results showed that the expression levels of Caspase 3 at 80  $\mu$ g/ml tested had shown 1.10 fold expression and 160  $\mu$ g/ml test had shown 2.61 fold expression compared to control. The expression levels of Caspase 8 at 80  $\mu$ g/ml tested had shown 0.49 fold expression and 160  $\mu$ g/ml tested had shown 0.30 fold expression compared to control. Therefore, the studies revealed the expression of Caspases 3 and 8 was downregulated as the treatment concentrations increased. Thus, the activation of Caspases revealed that biogenic ZnO NPs induced apoptosis in MDAMB-231 cells through mitochondria-independent pathway. Hence, the Bio-ZnONPs have the great potential applications on various research areas including medical, agriculture and industries. Thus, the biogenic method is a simple, eco-friendly, safe and feasible ones.

**Keywords:** Apoptosis, Biogenic ZnO NPs, MDAMB-231 cell lines, DNA fragmentation.

**0504104 RANJITHA, H. R; UDAY, J AND HARIPRASAD, T P N (Department of Life Science, Bangalore University, Bangalore). FUNCTIONAL ANALYSIS OF DEATH-ASSOCIATED PROTEIN KINASE (DA PK) WITH THE HOMOLOGUES OF ARABIDOPSIS THALIANA**

A Bioinformatic search was carried out for plant homologues of Death-associated protein kinase (DA PK) involved in signal-induced cell death and autophagy. Number of proteins in *Arabidopsis thaliana* was found to be homologues. The closest homologue was found to be Hexokinase-1, Hexokiase-2, Bifunctionaldihydrocamalexate synthase. Analysis of 3 dimensional structures of these proteins confirmed its relationship with the kinase family of proteins to explore the function of DA PK.

**Keywords:** Death-associated protein kinase (DA PK), autophagy, Arabidopsis thaliana, Bifunctionaldihydrocamalexate synthase

**0504105 RAO, MADHUSHREE M.V; GOVINDAPPA, M AND HARIPRASAD, T.P.N (Department of Biotechnology, DayanadaSagar College of Engineering, Bengaluru-560078). IN-SILICOANTI-DIABETIC ACTIVITY OF ERYTHRIN**

Diabetes mellitus (DM) is leading immunological disorder, management of this is a huge challenge. Herbal medicines are strongly preferred for the treatment of DM for their anti-hyperglycemic effect. Among them, lichens have attracted the attention for its antimicrobial, antioxidant and also for its anti-diabetic property. Erythrin is a compound present in lichens having different biological activity. This study aimed to evaluate molecular interaction of erythrin with targeted proteins related to DM. Molecular docking study was performed with iGEM docking software. It was observed that erythrin showed the highest interactions with 1XU7 (crystal structure of the interface open conformation of tetrameric 11b-hsd1), 1ZON (cd11a i-domain without bound cation), 2Q5S (crystal structure of ppargamma bound to partial agonist ntzdpa), 3C45 (human dipeptidyl peptidase iv/cd26 in complex with a fluorolefin inhibitor) and 3K35 (crystal structure of human sirt6). Further the ADMET SAR analysis confirmed that it was non-carcinogenic and non-AMES toxic. With the drug likeliness property, erythrin can be considered for developing into a potent anti-diabetic drug. Thus, enabling a possibility of using this plant extract as a new alternative to the existing diabetic treatment.

**Keywords:** Lichens, Erythrin, Diabetic Protein, Insilicointeraction, admet SAR

**0504106 SABANAVAR, SHWETA J (Department of Botany, P C Jabin Science College, Hubballi-580031). PHYTOCHEMICAL ANALYSIS AND ANTIMICROBIAL ACTIVITY OF PUNICAGRANATUML. AND ZINGIBEROFFICINALEL. PLANT EXTRACTS AGAINST FOOD POISONING MICROBES**

Food poisoning is an illness and prevention of food poisoning pathogen is normally achieved by chemical preservatives. The chemical substances have a negative effect on human health because of such concerns we need to find very effective, safer and natural alternative preservatives. In the present study phytochemical screening and antimicrobial activities of *Punicagranatum*L.and*Zingiberofficinale*L. was evaluated. Plant extract have been used to control food poisoning pathogen and preservation. Qualitative preliminary phytochemical screening of *P. granatum* peel extracts and ginger were assessed by standard methods. Results revealed that activity of secondary metabolites in ethanol and acetone is higher than chloroform and petroleum ether. The antimicrobial activity of pomegranate and Ginger was analyzed against *Escherichia coli*,*Staphylococcus aureus*, *Bacillus subtilis*and*Aspergillus niger* using disc and well diffusion methods. The ethanol and acetone extract of the two plants were prepared and results revealed that concentration of extract effect the activity of microorganism and *P. granatum* showed high antimicrobial activity than ginger. These plants extracts can be used as a natural preservative to control food poisoning, fungicides and used as a food preservative. Natural selection of preservatives decreases the rate of human health hazards and acquisition of microbial resistant.

**Keywords:** Antimicrobial activity, Disc diffusion, well diffusion, Phytochemical screening

**0504107 SAMPATH, K.S; NAVEEN, K; CHAITALI, G; SOUMYA, P; NIRMAL, K AND SUNITA, S (Tata Institute for Genetics and Society, NCBS campus, GKVK, Bellary Road, Bangalore-560065). COMPARATIVE ACCOUNT OF VARIOUS PARALLEL STRATEGIES AVAILABLE FOR MANAGEMENT OF MOSQUITO VECTORS**

Global health continues to be one of the most important issues facing mankind. Among them, mosquito vectored diseases such as Malaria, Dengue, Chikungunya, West Nile Virus, Japanese Encephalitis etc. There have been several scientific advances that encompass strategies based on population suppression or population modification. The uniqueness of these approaches are they can be implemented either in combination or in parallel to the other conventional practise to enhance its efficacy. Very recently a population of the world's most invasive mosquito species *Aedesaegypti*, was almost completely wiped out on two islands in the southern Chinese province of Guangdong. Many other countries like Australia, Indonesia, Sri Lanka, USA, Hong Kong, China, Africa, Brazil, Philippines etc. have taken several strides in management of mosquito vectors. The paper provides an overview of various strategies that are available for India towards management of mosquito vector. Population suppression strategies like *Wolbachia*, Sterile insect techniques, Oxitec's Friendly™ technology have been widely tested in *Aedesaegypti* mosquitoes. Population immunization/ modification strategies like Genetic engineering and

RIDL techniques have been tested in *Anopheles*. The science behind these strategies, their complexities, opportunities and feasibility will be discussed. The precision, environmental sustainability, persistence, toxicity, scalability with respect to Indian context and flexibility in implementing these technologies would be of prime importance in their adoption for vector management programs in India.

**0504108 SHANTHALA, M; CHANDRAKALA, M AND KARUNYAA, JYOTI R (Center for Applied Genetics, Department of Zoology, Bangalore University, Jnanabharathi, Bengaluru-560056). ACUTE MYELOID LEUKEMIA (AML) WITH RARE CHROMOSOMAL ANOMOLIES**

Acute myeloid leukemia (AML) is a category of diseases with a common aggressive clinical presentation, a poor prognosis and management is dependent upon the underlying genetic characteristics of the neoplasm. AML patients have rare recurrent cytogenetic anomalies and have not been characterized and their impact on prognosis remains unclear. Genetic analysis of AML is essential, and conventional karyotyping is the key factor in the diagnosis and management of AML. Accordingly, a meta-analysis was performed to explore the rare cytogenetic abnormalities in AML patients. In this study, 65952 cases were studied, 251 males (63.87%) and 142 females (36.13%). The range of age in this study was 2 months to 87 years. The maximum chromosomal abnormality was observed in males compared to females, the median age of 31 years. Individual karyotypes showed that a total of 23 types of rare cytogenetic abnormalities were recorded. The analysis of AML data showed that the incidence of ph+ve chromosome, complex karyotypes, tetraploid/near tetraploid (T/NT), t(1;2)(p35;p22), t(1;3)(p36.2;p26.2), t(10;12)(p15.2;q24.11); high hyperploidy,  $\geq 49$  chromosomes, tetraploidy ( $4n = 92$  chromosomes); del Y or X, 9,7; Abn19q13; Trisomy 22, Core binding factor (CBF) (+ve AML) are marker karyotypes, which is of significance. The highest % incidence of individual rare abnormalities in AML patients is t(1;2) (p35;p22), t(1;3) (p36.2;p26.2) t(10;12) (p15.2;q24.11), HH (high hyperploidy,  $\geq 49$  chromosomes) Tetraploidy ( $4n = 92$  chromosomes) (0.1811). This study provides important prognostic information and also evidence to recognize as a distinct category within the newer WHO/FAB classification.

**Key words:** Acute myeloid leukemia, Karyotype, Chromosomal anomalies, Prognosis, Neoplasm,

**0504109 SUMACHIRAYU, C. K; KUSUMA, C. G; GUBBIVEERANNA, VINOD; BHAVANA, S AND NAGARAJU, S (Department of Studies and Research in Biochemistry, Tumkur University, Tumkur-572103). EVALUATION OF ANTIOXIDANT, TRYPSIN INHIBITION AND PHYTOCHEMICAL ANALYSIS FROM THE SEEDS OF GARCINIACAMBOGIA**

*Garciniacambogia* is native to south eastern Asia. The fruit rind of the plant is commonly used as a food preservative and food bulking agent. Traditionally it is used to treat constipation, piles, rheumatism, edema, irregular menstruation and intestinal parasites in Asian countries. This study has taken up to evaluate the antioxidant and trypsin inhibitory activities of the different solvent extracts of *G. cambogia* seeds. Different solvent extractions (petroleum ether, ethyl acetate, acetone and methanol) of *G. cambogia* seeds were prepared and evaluated for antioxidant activity by DPPH assay. In addition, extracts were evaluated for trypsin inhibition using casein as substrate. Further, extracts were analyzed by Gas Chromatography Mass Spectrometry (GC-MS). *G. cambogia* seeds were powdered and solvent extraction was prepared using soxhlet apparatus. Among the four solvent extracts tested, methanol extract has shown potential antiradical activity with  $IC_{50}$  value of 20.5  $\mu\text{g/mL}$  and trypsin inhibition upto 80% followed by ethyl acetate extract. GC-MS analysis has shown different phytoconstituents responsible for antiradical and trypsin inhibitory activities.

**Key words:** Garciniacambogia, antioxidant, DPPH, trypsin

**0504110 GUBBIVEERANNA, VIOD AND NAGARAJU, S (Department of Studies and Research in Biochemistry, Tumkur University, Tumakuru-572103). PROCUMBENASE – A SERINE PROTEASE FROM TRIDAXPROCUMBENS: IT'S ROLE IN WOUND HEALING**

The present study aimed at purification, characterization and evaluation of the wound healing property of 'Procumbenase' – a serine protease from *Tridaxprocumbens* extract. Procumbenase was purified by combination of

gel filtration and ion exchange column chromatography methods. The purity was evaluated by SDS-PAGE and RP-HPLC methods. Procumbenase showed a specific activity of 3.22 units. The wound healing activity was evaluated by using Wistar albino rats by excision and incision wound models. Wistar albino rats were divided into five groups each consisting of six animals; group I (left untreated) considered as control, group II (saline treated) considered as negative control, group III treated with 5%(w/w) povidone iodine, which served as standard, group IV treated with Procumbenase 1%(w/w) and group V treated with Procumbenase 2%(w/w) were considered as test groups. All the treatments were given once daily. The wound healing effect was assessed by percentage wound contraction, epithelialization period and histoarchitecture studies in excision wound model. While vascularization, tensile strength and hydroxyproline content in the tissue was studied in the incision wound model. Procumbenase significantly showed the wound healing activity in both excision and incision wound models. The histopathological study showed the wound healing capacity of Procumbenase with increase in collagen content, increase in tissue regeneration, increase in reepithelialisation, formation of new blood vessels and decrease in infiltration of polymorphonuclear leukocytes. The Procumbenase also increases the hydroxyproline content in the tissue. In conclusion, Procumbenase is a potential wound healing molecule from *T. procumbens*. Further clinical trial studies may lead to discovery of a new pharmacological molecule.

## 05. BIOTECHNOLOGY

## 06. CHEMICAL SCIENCE

**0506111 CHETANA, P. R; NAVYA, D. R AND NOLTE, N. M (Bengaluru Central University, Department of Chemistry, Central College Campus, Bengaluru). ALKYNE AND NITRO FUNCTIONALISED LANTHANUM ANALOGUES AS ARTIFICIAL NUCLEASES : SYNTHESIS AND CHARACTERISATION**

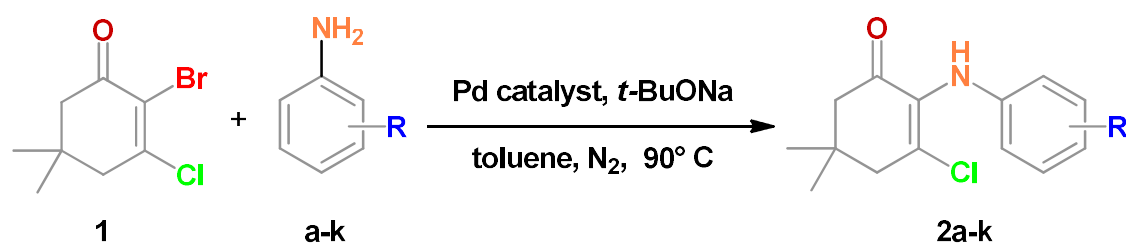
Four ternary polypyridyl lanthanum (III) complexes  $[La(atpy)_2(NO_3)_2](NO_3)$ (1),  $[La(atpy)(phen)_2(NO_3)_2](NO_3)$ (2),  $[La(NO_2-tpy)_2(NO_3)](NO_3)_2$  (3), and  $[La(NO_2-ptpy)(phen)_2(NO_3)_2](NO_3)$  (4) where atpy= N-ethynyl-[2,2':6',2''-terpyridine]-4'-carboxamide, phen= 1, 10-phenanthroline, and NO<sub>2</sub>-ptpy=4'-(4-nitrophenyl)-2,2';6',2''-terpyridine have been synthesized, characterized, and their DNA binding and cleavage activity studied. The complexes show coordination numbers 10 and 11. The peaks in FT-IR spectra of complexes confirm the coordination of polypyridyl and nitrate ligands. The m/z ratio of the complexes with the molecular ion peak of the Ln(III) complexes. The complexes 1 and 2 exhibits good DNA binding propensity ( $k_b=1.88 (\pm 0.2) \times 10^5$  for 1 and  $k_b =6.82 (\pm 0.2) \times 10^5$  for 2). The complex 2 shows maximum cleavage activity with the pUC19 DNA in the presence of oxidizing agent.

**0506112 CHAKRAVARTHY, A S JEEVAN; MANJUNATHAYYA AND HARIPRASAD, S (Department of Post -Graduate Studies in Chemistry, Central College Campus, Bengaluru Central University, Palace Road, Bangalore). BUCHWALD-HARTWIG CROSS-COUPLING REACTION: SYNTHESIS OF SOME NOVEL CYCLIC OLEFINIC SECONDARY AMINES**

Vinyl amines in general are unstable compounds which easily hydrolyze to the corresponding ketones. Due to their biological and industrial importance several methodologies are reported in the literature for the synthesis of vinyl amines. The Buchwald-Hartwig cross coupling reaction has become an important tool for the synthesis of vinyl amines.

In our previous work, we had reported the synthesis of a new class of cyclic vinyl amines by the Buchwald-Hartwig cross coupling reaction using a novel benzimidazolyl palladium complex. To increase the scope and utility of our work, we extended the Buchwald cross coupling reaction to 2-bromo-3-chloro-5,5-dimethyl-2-cyclohexenone (**1**).

We now report for the first instance of time, the regioselective synthesis of a 1-chloro-2-aminophenyl-5,5-dimethyl-3-cyclohexenones **2a-k**. Reaction of **1** with ten aromatic amines in presence of the novel palladium catalyst afforded the products **2a-k** in > 80 % yields (Scheme).



Scheme

**0506113 JAYASREE, A. C. (Research and Development Centre, Bharathiar University, Coimbatore). ELECTROCHEMICAL APPLICATIONS OF GREEN SYNTHESIZED NI BASED COMPLEX**

We have successfully synthesized salicylate based nickel [II] complex by eco-friendly, simple, and cost-effective stirring route on hot water bath. The synthesized product was characterized and electrochemical studies have been studied. The nickel complex was made into electrode and an electrochemical study was carried by cyclic voltammetry. The redox behaviour of Ni-bhb/cpe was utilized for low concentration detection of nitrate ion in pH 4, pH 7 and pH 9 buffer solutions separately. The Ni-bhb/cp electrodes shown good response for the 10 $\mu$ M analyte in pH 4 buffer solution and also specific capacitance behaviour of same electrode have been studied. The specific capacitance found to be 45.

**Keywords:** Ni[II] complex, Water as solvent, Specific capacitance, cyclic stability, Buffer solutions, cyclic voltammetry, electrochemical detection. MB analyte.

**0506114 KHAN, MOHAMMED IMRAN AND SHIVASHANKAR, KALEGOWDA (P.G. Department of Chemistry, Central College Campus, Bangalore University, Bangalore). IODINE CATALYZED ONE-POT FOUR COMPONENT SYNTHESIS OF COUMARINYL PHOSPHORAMIDATES VIA SEQUENTIAL ADDITION OF REACTANTS**

A concise approach to various coumarinyl phosphoramidate derivatives has been developed by iodine catalyzed one-pot four component sequential addition of 4-bromoethylacetoacetate, sodium azide, triakyl

phosphites, and phenols in ethanol solvent. The reaction proceeds via nucleophilic substitution reaction, phosphoramidate rearrangement and pechmann cyclisation with C-C, C-O, C-N and N-P bond formation.

**0506115 KRISHNAMURTHY, G AND MANJUNATH, K (Department of Studies in Chemistry, Jnanabharathi Campus, Bangalore University, Bangalore). SYNTHESIS OF NOVEL CERIUM-DPTU METAL ORGANIC FRAMEWORK AND STUDIES ON SUPER CAPACITOR APPLICATIONS**

A new Ce-DPTU metal-organic frameworks were synthesized by economically feasible slow evaporation method. Further the synthesized Metal-organic Frameworks (MOFs) were characterized by FTIR, PXRD, SEM, EDAX and SXRD methods. FTIR peak at  $3200\text{ cm}^{-1}$  confirms the presence of N-H vibrations. The SEM-EDS results of Ce-DPTU MOFs confirm that the synthesized MOF crystals were in single phase and composed by Ce, C, N, O and S. Cyclic voltammetric was carried out by using prepared Ce-DPTU electrode comparing with the bare carbon paste electrode using 1M KOH compared with  $\text{K}_4\text{Fe}(\text{CN})_6 + \text{K}_3\text{Fe}(\text{CN})_6$  in 1M KOH solution as electrolyte. Super capacitor applications of Synthesized Ce-DPTU MOFs were by galvanostatic charge-discharge methods (GCD). The obtained Ce-DPTU MOF crystals blended with carbon paste electrode come up with a high capacitance of 1333 F/g at 1 A/g and shows a long-term cyclic stability (80% retention after 900 cycles at 1 A/g) in a 1 M KOH aqueous solution. This study suggests that the Ce-DPTU MOFs have promising ability for super capacitor applications.

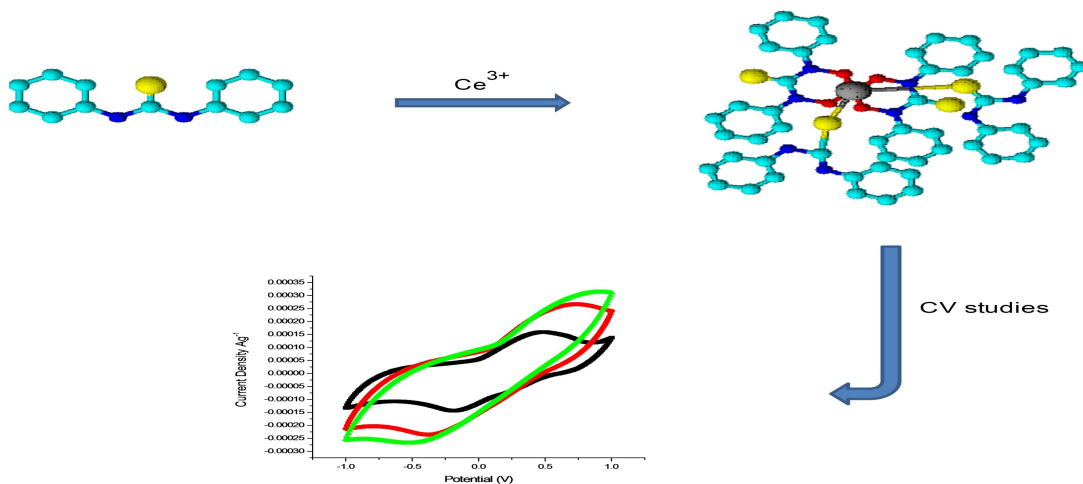


Fig 1. Schematic representation of Preparation of Ce-DPTU MOFs

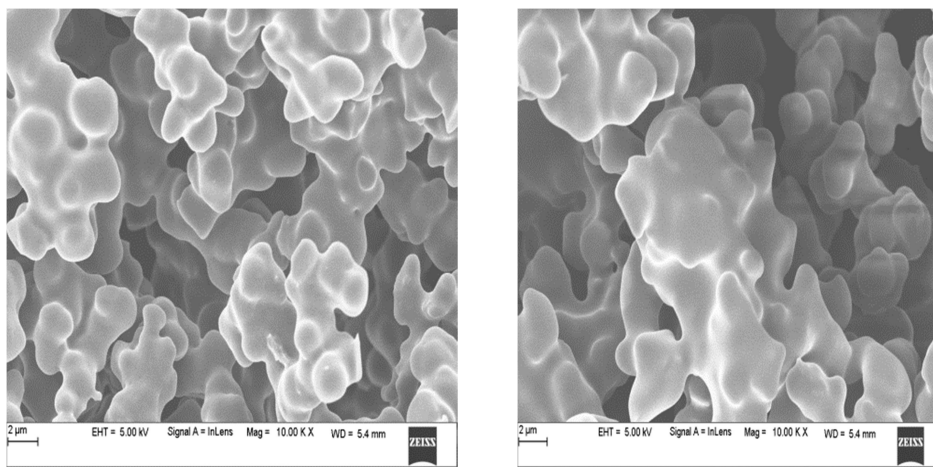
**0506116 OMKARAMURTHY, B. M. AND KRISHNAMURTHY, G. (Department of Studies in Chemistry, Bangalore University, Bangalore). A NEW IRON-BASED METAL-ORGANIC FRAMEWORK (FE-MOF) WITH ENHANCING ELECTRO CATALYSIS ACTIVITY AND SUPER CAPACITOR APPLICATION**

A new Fe-MOF has been solvothermally synthesized by the reaction of terephthalic acid in DMF. The samples were characterized by FTIR, PXRD, FE-SEM, TGA, BET and electrochemical studies. They have received great attention because of their peculiar structural properties, such as large specific surface areas, tuneable porosities, good thermal stabilities, and uniform structured nanoscale cavities. Super capacitive behaviour of synthesized Fe-MOF was evaluated using cyclic voltammetry (CV), galvanostatic charge/discharge (GCD), and electrochemical impedance spectroscopy (EIS) measurements in 3 M KOH as electrolyte. The Fe-MOF exhibited outstanding specific capacitance of  $830\text{ Fg}^{-1}$  at a discharge current density of  $1\text{ Ag}^{-1}$  and an extensive cyclic stability of up to 2000 cycles with capacity retention of  $\sim 90.1\%$ . The excellent electrochemical properties of Fe-MOF can be



credited to the large surface area with a high microporous volume of structurally implanted electro-active metallic centres and the rapid transport of ions into electrolytes / electrodes. The results imply that the Fe-MOF electrode could be the potentially high-performance electrode material for super capacitor applications.

**Keywords:** Fe-MOF; Solvothermal synthesis; Specific capacitance; Energy storage; Supercapacitor



**FE-SEM images Fe-MOF at different magnifications (1 and 2 μm)**

**0506117 RAKSHITH, R; SHALINI, B C AND SHIVASHANKAR, K (Department of Chemistry, Bangalore Central University, Bengaluru). SYNTHESIS AND CHARACTERIZATION OF  $\alpha$ - PEPTIDE CONTAINING L-PHENYLALANINE AND L-ALANINE (H-Phe-Ala-OH)**

This reaction contains four steps, that is protection of acid group of one amino acid (Alanine) and amine group of another one, coupling of boc protected amino acids and hydrolysis followed by de protection of boc group. The overall reaction monitored through TLC analysis. Once the starting materials were consumed, reaction mass were taken for workup and further product analysis. We have to check whether the formed product is required one or not, so we taking the formed product for further analysis. Such as  $^1\text{H}$  NMR, LCMS, IR analysis etc.

**0506118 SANGEETHA, S; KRISHNAMURTHY, G. AND FORO, SABINE (Department of Studies in Chemistry, Central College Campus, Bangalore University, Bangalore). ANTI-BACTERIAL ACTIVITY OF CO AND ZN- CROWN ETHER METAL-ORGANIC FRAMEWORKS**

The anti-bacterial performance and comparison studies of synthesized Co and Zn Crown ether metal organic frameworks (CEMOFs) on *S. Aureus*, *B. Subtilis*, *E. Coli* and *P. Aeruginosa* have been studied. The Co and Zn CEMOFs were synthesized by the reaction of metal salts and crown ether by stirring method. The synthesized MOFs were characterized by FT-IR, FESEM and S-XRD.

The Co-CEMOF shows significant inhibition activity on *S. Aureus*, *B. Subtilis* and *E. Coli* at lower concentration of about 5 ppm. Zn-CEMOF shows inhibition activity on *S. Aureus* and *P. Aeruginosa* at lower concentration but it failed to kill growth on *B. subtilis* and *E. coli*. Hence, type of the metal ion is crucial for antibacterial character.

**Keywords:** Co and Zn-CEMOF, Crystal structures, FESEM analysis, Antibacterial activity.

**0506119 PRASAD, K. SHYAM AND SHAMSHUDDIN, S Z MOHAMED (Chemistry Research Laboratory, HMS Institute of Technology, Tumkur). METAL SUBSTITUTED ALLUMINOPHOSPHATE AS**

**AN HIGHLY EFFICIENT SOLID ACID CATALYST FOR SYNTHESIS OF COUMARIN DERIVATIVES UNDER SOLVENT FREE CONDITION**

Synthesis of Coumarin derivatives from phenol and Ethyl Acetoacetate(EAA) via Pechmann condensation using heterogeneous solid acids such as amorphous aluminophosphates (AP) and iron aluminophosphates (FeAP) were prepared and characterized for their physico-chemical properties such as BET, NH<sub>3</sub>-TPD, PXRD, FT-IR, SEM and NMR techniques for their surface area, surface acidity, crystallinity, morphology and functionality. These solid acids were evaluated for their catalytic activity in the synthesis of coumarin derivatives under solvent free conditions. The reaction conditions were optimized by varying the parameters such as molar ratio of the reactants, reaction temperature and amount of the solid acid catalyst. In particular FeAlP consisting of 0.025 mol% Fe was found to be highly active for coumarin derivative synthesis. In addition, the catalysts can also be reused at least for 4 reaction cycles without any appreciable loss of catalytic activity.

**Key words: Coumarins, Pechmann condensation, Solvent free reaction, Amorphous aluminophosphates ,Iron Aluminophosphate.**

**0506120 SANGEETHA, S. AND KRISHNAMURTHY, G. (Department of Studies in Chemistry, Bangalore University, Jnanabharathi College Campus, Bangalore). ELECTROCHEMICAL ENERGY STORAGE AND ANTIBACTERIAL APPLICATIONS OF SALICYLATE BASED MANGANESE AND ZINC COMPLEXES**

Metal complexes have been identified as the materials of great interest due to their multiple applications. The synthesized products were characterized by the techniques such as PXRD, SEM, FTIR, BET, TGA, MASS and NMR techniques. Also the electrochemical studies have been carried out to explore electrical behaviour of these metal complexes. The Cyclic voltammetry studies were made by using the working electrode prepared by the above M-bhb complex sample in 0.05M K<sub>4</sub>Fe(CN)<sub>6</sub> electrolyte. Charge-discharge property of Zn-bhb/cpe and Mn-bhb/cpe were studied in 0.05M KOH solution. A significant electrochemical response has been shown by the these electrodes.

**Keywords: M-edta (Zn, Co and Cu), Water as solvent, BET surface area, Specific capacitance, heavy metals detection.**

**0506121 VEERESHA, G. and KRISHNAMURTHY, G. (Department of Chemistry, Jnanabharathi campus, Bangalore university, Bengaluru). HYDROTHERMAL SYNTHESIS OF MoO<sub>3</sub> ON REDUCED GRAPHENE OXIDE (GO) FOR SUPERCAPACITOR APPLICATIONS**

The MoO<sub>3</sub> shows potential applications for their rutile structure compared to other TMO (transition metal oxides). It was synthesized using a hydrothermal process and its phase structure was confirmed by PXRD. The FT-IR, FESEM-EDX were used to characterize the Material and its catalytic properties were studied by cyclic voltammetry, Galvanostatic charge and discharge studies. The MoO<sub>3</sub> hexagonal structure anchored on reduced graphene oxide(RGO), which increases its surface morphology which leads to increase its surface area. The specific capacitances of MoO<sub>3</sub>/RedGO show 260 F g<sup>-1</sup> at lower current density 1Ag<sup>-1</sup> and having high stability. In fuel cell the ethanol sense from 0.5M to 0.0094 mM in 1M KOH solutions.

**Keywords; MoO<sub>3</sub>/RedGO; Transition metal oxides; Reduced graphene oxide; Galvanostatic charge-discharge, cyclic voltammetry.**

## **07. COMMERCE**

### **0507122 CHAKRAVARTI, NIRUP KAMAGETHI P. L. (University of Warwick). MILLENNIAL MINDSET TOWARDS ENTREPRENEURSHIP**

The traditional value of entrepreneurship has been about hard work, persistence, consistence, willpower and courage. A right mix of these quirks have proven to be the key for any entrepreneur to be successful. But the researcher would like to bring light on to the millennial generation of wannabe entrepreneurs, whom he feels will have to have a different mix of quirks to be successful.

A critical review of policies, loans and grants for startups reveals that the government's of Centre as well as State have been making efforts towards encouraging entrepreneurship.

Even though governments have been taking up initiatives to promote the startup culture, it has been observed that more than 90% of the startups fail in the country. Considering the population and the glorified outlook

in the world we carry, the failure rate has been severe. Even if the arguments of the unicorn growth percentage is used for a debate, the numbers don't prove well for a country holding this massive population.

The researcher feels that it is time for the country to leave behind the stereotypical way in which the leaders portray the country to be in and its time for the citizens and interested individuals to take action into developing the right skills and a mindset towards being credible enough to make use of the merit of the startup policies.

Among India's 789 Universities, the fields covered would include medicine, engineering, arts, psychology and rest. They hold equal scope as any management institute would in the space for entrepreneurship. But right exposure is absent even among the top universities in guiding students towards their entrepreneurial goals.

It is observed that the social media's influence on entrepreneurship has been so intense that it has been diluted by people who have decided to take control and lead the aspirants onto a dark path.

The researcher doubts whether this action in social media has been going hand in hand with the way the millennial mind is biologically intended to react and if it does, what organic actions could an individual inculcate to overcome the hype and achieve their dream.

The researcher learns that the generation which lives online more than in the present world is more connected than that by the traditional ones did. Questions arise, if the compelling information and the overload of the same wears a facade in front of the younger generation to make them believe that they are ready to face the risks of entrepreneurship. And if succeeded to pursue them to march forward towards working on ideas while they actually could prepare themselves well enough to solve bigger problems in the world such as poverty, education, sustainable living, drinking water, sanitation and such global goals. This point could very much ignite an argument when one says a modern entrepreneur starts with a problem they have faced individually and they move forward to solve what they feel could be the problem of many. Whereas, when compared to traditional businesses or the so-called unicorns, they solve collective global problems in a sustainable way. Also does the way the country thinks and look at differs from the way one would in a foreign country? The scope for innovation and ease of doing business, holds a greater possibility of success among aspirants at home as it does with in other countries.

In this presentation an effort is made to list the traditional entrepreneurial skills and mindsets which helped great businessmen of the history to flourish and how the new pathways in the world today have been guiding the newer generations to achieve the same. The glorious outlook by governments, liberated thinking and the endangered quality of life make the possibility of a bright future hard enough to imagine but also keeps the spark of hope alive.

**0507123 FATIN AND MUNINARAYANAPPA, M (Department of Commerce, Bangalore University, Bengaluru-560056). AN EVALUATION INTO MOTIVATIONS OF CONVERTIBLE BONDS ISSUANCE**

Historically, convertible bonds have been an area of interest for research and many studies have been undertaken. There are a number of theories which focus on the motives for convertible bonds issuance. There have been many empirical studies which are mainly concentrating on the testing the four theoretical models. The empirical studies primarily emphasize on the challenging the validity of four theoretical models which are namely the Stein's back-door equity theory in 1992, Brennan and Kraus (1987) and Brennan and Schwartz (1988) -Risk uncertainty theory, Green's risk shifting theory in 1984 and Mayers' sequential financing theory in 1998. An attempt in this paper has been made to document the various studies from 1955 to 2011 on the motivations of convertible bonds issuance. The data collected for this research is from secondary sources of data. The inference drawn from the study is that even though there are diverse responses from the numerous studies, the theory which gains most popular response is the Stein's theory of back door equity. We conclude by saying that convertible is a very decent funding policy for the companies when they actually need to augment in equity into capital structure but by issuing bonds that are convertible in nature which is in fact deferring your equity since they have the possibility of conversion into equity in the future.

**Key words: Convertible bonds, motivations, theories, review**

**0507124 KOMAL, S AND MADHAVI, S R (Department of Commerce, Bengaluru Central University, Bengaluru-560001). THE SUCCESSIVE TRANSITIONAL INFLUENCE TOWARDS CASHLESS ECONOMY-A STUDY WITH SPECIAL REFERENCE TO INDIAN ECONOMY**

Over a period of time the utilization of currency in India has undergone numerous changes. Digitalized form of money has been in existence in India from a very long time but boosted the usage of such techno money after the recent move of demonetization. The India is cash centric nation, with the existence of cashless economy in connection of upgraded technology has brought a drastic change in the Indian economic environment, leads to improvement in credit access and financial inclusion, reduce the risk and control on cost management with the help of usage of mobile devices and online payment apps with protective measures in each and every transactions. The digitalised economy unearths the black money and control on the circulation of fake currency. The primary aim of going cashless economy is to track every obscure transaction and also to reduce the economy's dependence on cash and deviate it towards digital ones. With the developments in information and communication technology worldwide different and innovative payment systems are also evolved. There has been both adverse and favourable impact of cashless transaction to laymen. This is the duty of the government and also other organizations to educate general public to make use of the technology in an increasing phase. If the necessary steps are undertaken then it can be said that in the near future India can definitely go completely cashless and equally compete with other developed and developing countries. However, *India moving towards "less cash economy- a phase of cultural-economic transition"* The present study is focused on usage of technology as a means and its successive transition and significance for cashless transactions on the present scenario of the economy. For the purpose of study, the review of literature based on latest national and international studies to find out the uniqueness of the present study. Both primary and secondary data has been collected, processed and presented in the form of tables, figures and interpreted accordingly with the help of simple descriptive statistical techniques, also provide suitable findings and conclusion.

**Key words: Digital transformation, Digital gateways, Cashless economy, Technology.**

**0507125 KUMAR, NAVEEN I M; MADHAVI, S R AND KOMAL, S (Department Of Commerce, Government First Grade College, Kadur). ESSENCE OF HUMAN RESOURCE ACCOUNTING IN ACCOUNTING EDUCATION AND RESEARCH**

Accounting is now regarded as a service activity, a descriptive, analytical discipline and an information system. With this view human resource accounting is an emerging area and is more concerned with the area of accounting and acts as an effective mechanism for decision making. The introduction of human resource accounting is possible and the fair valuation of human resources is also possible. Hence, it's inferred that human resources are the assets for business and play an important role in the success of any business. And also the investments in human resources are equilent nature to other assets. It is more useful to the internal management decision making of an organization. Further it is also useful to the employee motivation. Human Resource Accounting means to measure the cost and value of the people (i.e. of employees and managers) in the organization. It measures the cost incurred to recruit, hire, train and develop employees and managers. HRA also finds out the present economic value of its employees and managers through preparing HRA report. It is a method to measure the effectiveness of personnel management activities and the use of people in an organization. *"A term used to describe a variety of proposals that seek to report and emphasize the importance of human resources – knowledgeable, trained and loyal employees in a company earning process and total assets."* Hence the present study focus on essence of human resource accounting in educating the accounting professionals and influence the research in HR accounting. For the purpose of study, the review of literature based on latest national and international studies to find out the uniqueness of the present study. Both primary and secondary data has been collected, processed and presented in the form of tables, figures and interpreted accordingly with the help of simple descriptive statistical techniques, also provide suitable findings and conclusion.

**Key words: HR Accounting, Decision making, Human resources, Internal decisions.**

**0507126 KUMAR, PAWAN D. B. AND JALAJA, K. R (Department of Commerce, St. Joseph's Evening College, Museum Road, Bengaluru). A STUDY OF PERSPICACITY OF CONSUMERS TOWARDS LPG BASED AUTOMOBILES IN INDIA**

As the petrol prices have been deregulated and are entirely reliant on the market, it is difficult for a common man especially when it comes to affordability. Western countries are using LPG based automobiles especially in four wheeler segment, there is a usage of auto-Gas as regular use of gasoline or diesel which is decreasing the cost burden to the economy. Even though there is an option of using LPG as a fuel for automobiles the consumers in India are not purchasing it. Companies like Tata, Hyundai and Maruthi Suzuki are manufacturing LPG based vehicles; the consumers are not buying it.

**Keywords: Petrol, LPG, Four wheeler, LPG based automobiles.**

**0507127 KUSHALA (Department of Commerce and Management, Maharani Cluster University, Bangalore). IS WATER STILL A HUMAN RIGHT?-A CONCEPTUAL STUDY**

The human right to water and sanitation (HRWS) was recognized as human right by the United Nations General Assembly on 28 July 2010. It stated "the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses". In India the position is similar, there is no explicit right to water in the constitution or the law. The right to water as a fundamental right is established by judicial pronouncements and interpretations, especially of the article 21, the right to life. Fulfillment of this right is indeed difficult as the ratio of population and accessible water is variable in our country.

To evaluate the relevance and applicability of this human right in the present state of water scarcity and also discuss about the misconceptions regarding this.

The methodology adapted to analyse and develop this paper is purely based on secondary data which is published in various books, journals and web sources.

The ethical answer to this question of water being a human right is in affirmative but legal response is unsatisfactory as the distribution of water resources aren't equitable.

There are various issues that are to be addressed in providing justice to this right.

**Key Words: Human right to water, Right to life, conservation, sustainable utilization.**

**0507128 LOKESHWARI, D V AND PARVATHI, R (VET First Grade College). CUSTOMER SATISFACTION TOWARDS MOBILE SERVICES AND MOBILE APPS IN M-COMMERCE - COMPARATIVE STUDY ON SELECTED COMPANIES IN KARNATAKA**

Communication has been playing a vital role in human life from time immemorial inventions. Now Mobile Consumers think of Mobile as one of the medium for any transaction, anywhere at any time. Mobile phone users and their reaction and satisfaction to any kind of services provided by the mobile network service provider is the most important criteria for the success of any new technology. However customer are quite adjustable to some of the basic mobile service extended by the new technology like making call, receiving call, sending and receiving short service messages and answering missed calls without much effort by the network service providers. The concept of M-commerce has taken birth from the traditional E- Commerce which is treated as today's need of the hour. This dissertation studies about the consumer satisfaction through their reaction towards selected basic Mobile services, Value Added Services, Mobile apps in general, Mobile Commerce apps in specific and Mobile network faults. Mobile telecommunications at various levels are discussed along with difference between E-Commerce and M-Commerce. Over the study discussed about the Various Mobile Services, Players, link and discussing about the customer drive to M-Commerce, limiting factors, benefits of mobile device and drawback to it. The objectives of the study is to study the various mobile services provided by the Airtel and BSNL networks and factors to attain Customer Satisfaction, to study the Customer Satisfaction towards Basic Mobile services provided by Airtel and

BSNL network, Comparative study towards Value Added Services provided by the Airtel and BSNL network, Comparative study towards Mobile Apps in general provided by the Airtel and BSNL network, to study the Customer reliability on mobile services while connecting globally through M-Commerce specific Apps provided by the Airtel and BSNL network. Scope of the study was restricted to south Bangalore city of Karnataka state with sample size of 100 Mobile service users. Mobile Subscribers from Airtel and BSNL network considered equally that is 50 respondents from each network. The information needs to be collected by gathering primary and secondary data. Survey has done with questionnaire containing both open-end and closed ended questions considering five selected Basic Mobile services, faults, VAS, Mobile apps in General and Mobile Apps in specific. Only attitude of consumer using Mobile, Mobile basic services, Mobile apps in general and Mobile Apps in specific of Airtel and BSNL network service providers are recorded as customer satisfaction. End of the survey, the data so collected has been analyzed, compared to give accurate conclusion and recommendations of only Airtel and BSNL network subscribers of randomly selected 100 respondents. This research is focusing more towards consumer acceptance of Mobile services in the form of Basic, Value Added, Apps in general, Apps in specific and faults found in service provided.

**0507129 MAHESH, K M AND MANJUNATH, K (Dravidian University Kuppam & Sri Bhagawan Mahaveer Jain Evening College Bengaluru-560004). THE GOVERNMENT OF INDIA SCHEMES AND POLICY ADVANCES OPPORTUNITIES FOR THE INCLUSIVE GROWTH THROUGH TAXATION, FINANCIAL INCLUSION, INNOVATION, SKILL AND SOCIAL ENTERPRENESHIP FOR THE DEVELOPMENT OF THE SOCIETY**

Inclusive growth in transport, gas, cleans water, electricity, community health, education and rural development. Financial inclusion is the key to inclusive growth for ensuring that benefit of a growing economic extend to all segments of society. Financial inclusion is the philosophy of providing affordable, safe, accessible, sustainable and properly regulated financial tool to the people for build their assets and improve the livelihood .The sustainable growth is Through bold innovation, skill development, good job, and entrepreneur are creating financial eco system. The government schemes like Social stock exchange, Pradhan Mantri kisan samman Nidhi,MGNREGA, Pradhan Mantri Kisan Pension Yojaha, PM Karmayogi Maandhan Scheme ,Microfinance schemes, digital India initiative payment banks, small finance banks.PM Jan Dhan Yojana, Financial support for pregnant women under Pradhan Mantri Matru Vandana. To Build on Amartya Sen's point inclusive growth also would mean going beyond simple access to formal finance. To support entrepreneurs Government has developed E-Hubs, Mudra Yojana Scheme for Women, Rural Small Business Development Centre (RSBDC) it is the first of its kind established by the world association for small and medium enterprises which is sponsored by NABARD. Credit Guarantee Fund Trust for micro and Small enterprises, Atal incubation center(AIC), ASPIRE was launched by the government in setting up a network of technology centers and incubation centers to accelerate entrepreneurship and also to promote startups for innovation in agro-industry, DigiGaon or Digital Village and Rural and Women Entrepreneurship Development (RWED) ,FAME scheme(Faster adoption and manufacturing of hybrid and electric vehicles ) and to MSMEs easing Angel Tax for start-ups, GST has reduced the tax barriers between the state and reduced the transaction cost and imparting new-age skills in areas like, AI, Big Data, Robotics . Skill development initiatives will transform the country economic growth and Young India is going to be a major supplier of skilled manpower to the world.

**0507130 MITTRA, UDAY KRISHNA (Department of Commerce, Khalisani Mahavidyalaya, Chandannagar, Hooghly) IMPACT OF GOODS AND SERVICES TAX (GST) ON THE INDIAN ECONOMY SINCE ITS INTRODUCTION**

**0507131 PUSHPA, A L; CHAKRAVARTI, NIRUP KAMAGETHI P L AND JAGANNATHA, V (Karnataka Vocational Training and Skill Development, Bangalore) SKILL BUILDING IN SOCIETY'S VULNERABLE GROUP IN INDIA: A CASE STUDY**

Agenda 21 is a global action plan evolved after decades of critical evolution of sustainable development. Our common feature of Mrs. Bruntland, former PM of Sweden has become a blueprint for the 21st first century. It was again Mrs. Margeret Mead who proclaimed that never suspect a small group of dedicated people if you see in the history. It is only a small group of people who made a difference socially, culturally and in a development context. In India, skill building among women can make a whale of a difference in quality of life and empowerment.

A critical review of empowering women in vulnerable SC/ST groups reveals that one in the recent past the Karnataka government has embraced upon empowering eligible women potential entrepreneurs to get into innovation, entrepreneurship and intrapreneurship.

During 2013-14 a female social committed chief secretary in the state of Karnataka, with support from the Chief Minister embarked upon a policy decision. The policy for 50% subsidy for industrial estate and 4% interest on a total loan amount from KSFC for female entrepreneurs.

It is observed that the various reasons this opportunity is yet to take off and reach the desired goals. In this paper an attempt is made for tracing the genesis of vulnerable women groups in various professional activities such as a teacher's wife of Jyothi Bapale has been documented.

In the recent past it is observed that 72% of all students in Karnataka are SC/STs. In this groups, inspite of girl child dropout in Karnataka, there are significant SC/ST women population who are the target groups of the mission.

The SC/ST community having treated as the lowest community among every other sections in the society, have only seen opportunities in menial works or any work in the fields ever since. Their living conditions even today have been observed to be below living standards as they have been treated as servants from many generations. Their payments have been in the form of food and shelter in exchange of their services to pay off their debts. This system was called the 'Jeetha Paddathi' or Bonded Labourers' during those conditions.

After years long of struggle, when Dr. Baba Saheb Ambedakar became the chairman of the Constitution Framing committee, the rights for this class of people was bought into existence.

A section which had always dependent on 'Hand to mouth existence' did see changes in the society and in the lives. In modern society there have been developments in socio-economically and administratively which have supported the growth of the section. The journey of a person from this society might have been through different shades which any other person from an other section might not even see.

The paper also suggests the methods, guidance and training programs such as reservation of purchase of goods from Women Entrepreneurs specially to bring up the section in the Entrepreneurial world in one among the few. The encouragement for sustainability and equality is a matter of importance.

With the focus on encouraging English medium there has been a significant improvement in potential rise in women entrepreneurs.

This significant development in Karnataka is documented in this presentation.

**0507132 RAKSHITHA, N (Bengaluru Central University, Bengaluru-560001). CORPORATE SOCIAL RESPONSIBILITY-CSR IN BENGALURU AND COMMON PEOPLE OPINION**

A company's sense of responsibility towards the community and environment (both ecological and social) in which it operates. Companies express this citizenship-

- (1) through their waste and pollution reduction processes.



- (2) by contributing educational and social programmes
- (3) by earning adequate returns on employed resources.

Companies have started moving away from traditional philanthropic projects and have begun institutionalizing CSR activities strategically.

India is the first country in the world to make corporate social responsibility (CSR) mandatory, following an amendment to the companies act, 2013 in April 2014. Businesses can invest their profits in areas such as education, poverty, gender equality and hunger as a part of any CSR compliance.

This paper will give a detailed description on various activities that have been conducted by the organizations in India, (especially in Bengaluru) and common people opinion regarding CSR activities, is being recorded.

**Key words: Corporate social responsibility, common people opinion, current CSR activities.**

**0507133 SIDDARAJU, H B AND MUNINARAYANAPPA, M (Department of Commerce, Jnanabharathi Campus, Bangalore University, Bengaluru-560056). THE ROLE OF PUBLIC SECTOR BANKS (PSBs) IN THE RETAIL LOANS SPACE**

The year-on-year (YoY) growth of the retail loan portfolios of commercial banks in general and public sector banks (PSBs) in particular has remained healthy by and large. A couple of hiccups have come to the fore lately, though Banks' NBFC counterparts in the retail loans space have done worse, no thanks to the Dewan Housing Finance Corp. Ltd and Infrastructure Leasing and Financial Services Ltd crisis that played the spoilsports lately. The researcher's interaction with two categories of stakeholders associated with retail banking, namely the PSB officers and experts on banking, led him to conclude that the PSBs woke up rather late to the potential offered by the retail loan portfolio. This led to a delay on their part in the exploitation of the potential offered by the bottom-of-the-pyramid in the retail loan space, thereby yielding the space to their NBFC peers until recently. PSBs believed that the ability to de-risk their portfolios led them to embrace their retail loan portfolios rather enthusiastically. Further, they realised that in an economy driven more by consumption than by investment and production, retail loans could help them to reduce their per-borrower exposure, thereby ensuring that their above-the-line and below-the-line figures remained unaffected. The delay in exploiting the retail loan space notwithstanding, the research recommends that the PSBs take their retail loan portfolios as seriously as they take their wholesale / business loan portfolios. The two are not mutually exclusive. A right mix of the two should stand them in good stead.

**Keywords: Bottom-of-the-Pyramid ; hiccups; NBFCs; peers; retail loans; spoilsports**

**0507134 SOMACHARY, YELSOJU (Department of Economics, Kakatiya University Warangal). MEGA PLAN OF BANKS MERGER, ISSUES AND CHALLENGES : A STUDY**

The finance minister of India Nirmala sitaraman has announced the governments plan to merge 10 public sector banks into four large banks on august 30<sup>th</sup> 2019, with an aim to have financially strong public sector banks in India. After the merging process there will be 12 public sector banks available including state bank of India and bank of Baroda. United bank and oriental bank of commerce have to be merged in Punjab national bank , syndicate bank has to be merged in canara bank, corporation bank and Andhra bank have to be merged in to union bank of India, Allahabad bank has to be merged in Indian bank.

The minister has also announced Rs.55000 crores recapitalisation plan for the banks to be formed after merger besides the Recapitalisation will also be infused into the six other banks which are not the part of this merger.

The merger will help the banks to improve operational efficiency and customer services, this would have involved synergies in branch network low-cost deposits and subsidiaries, but it not an easy task, its a challenging situation for the government as well as banks, the weakness of the smaller banks are transferred to bigger banks ,in

this current merger generally we can say its an easy. But in practice it will require a lot of hard work. Customers who are allotted new account number of IFSC codes will have to update these details with various third party entities. Employees will have to under go intermittent training programmes to get acquainted with the process and technology in the new environment.

Merging of two or more financial institutions is not an easy task in terms of consolidating the accounts ,infrastructure, management and marketing policies etc. It will take lot of perseverance to complete the merging process. Considering the above facts though this is a good idea for better governance ,but the consolidation of banks can not be successful until and unless issues related to them are to be resolved.

**Keywords: Consolidation, Merging ,Synergy, Recapitalisation ,Financial Institutions.**

**0507135 VITTALA, K.R. PUNDAREEKA AND Shinde, Pradeep Kumar (Presidency Evening College).  
EXCHANGE RISK ISSUES & CHALLENGES CONFRONTED ACROSS DIAMOND AND  
JEWELRY INDUSTRY: A STUDY ON EXTERNAL MITIGATION STRATEGIES**

Diamond Exporting & Jewelry Making Industry is largely exposed to foreign exchange risk. These industries are having large cash outflow due to imports of gems, precious metals & other inputs needed for rendering services to the customers at the same time, this industry earns foreign exchange from exporting them. Major chunk of transactions is denominated in foreign currency. Substantial amount of, nearly 75% of inflow & out flow which occurs in foreign currency, these companies need to design appropriate risk management techniques to mitigate the foreign exchange risk. Appreciation & depreciation of home currency leads to losses for the company. This paper examines the currency risk management practices of top ten listed companies chosen under Diamond Exporting & Jewelry Industry. The companies were selected based on market capitalization, ranging from large cap to small cap. The period selected for the study is post introduction of currency derivative i.e FY 2009 to 2017

**Keywords: Exchange inflows and outflows, FERM techniques, Forex, Forwards, Futures, Diamond Exporting & Jewelry industry.**

## **08. COMMUNICATION AND JOURNALISM**

**0508136 AKASH, J. H. AND ARAM, I. ARUL (Department of Media Sciencee Anna University, Chennai).  
USING SUSTAINABLE LIVELIHOOD FRAMEWORK APPROACH TO ANALYZE  
POTENTIALITY OF MASS MEDIA TO ACHIEVE SDG**

The idea of Sustainable Livelihood Framework (SLF) is an endeavour to go beyond the conventional approach to poverty eradication. Though SLF focused only on certain aspects of livelihood assets, it can be used as a tool to identify development priorities of the poor. SLF evaluates the viability of livelihood of people on economic, ecology and social basis. Based on the SLF, sustainable livelihood can be achieved by attaining livelihood assets consisting of five capitals, namely, human, natural, financial, physical and social. The access to these assets is interrelated and has multiple interactions among various factors. SLF enables the people directly involved as decision-makers; people always have a right to express their needs and concerns with regard to development programmes across society to the government that can be made aware by the mass media and communication. Better communication and communication systems can greatly assist decision-making at all levels and enable the information that is available to be used more effectively where it is needed within the system. Hence, 'access to mass media' is considered as strength of the poor that would help them to integrate. Lack of information

accompanies lack of power that can be overcome by mass media which has the strength to bring all the above-said five capitals together. Basically, information is a fundamental element for any kinds of development. Finding the effective communication techniques can assist local people to involve in decision-making. The poor are marginalized not only in relation to economic processes in society but also in relation to information and communication processes. In this paper, conceptual sustainable livelihood framework is used to access media and mass communication as major capital assets to attain all other assets. Based on survey and quantitative analysis, this study suggests that the media and mass communication can provide direct benefits for sustainable livelihood for the marginalized people through ecotourism.

**Keywords: Ecotourism, sustainable livelihood framework, livelihood assets, sustainable development goals, mass communication.**

**0508137 AROKIARAJ, AMALAN AND ARAM, I. ARUL (Department of Media Sciencee, Anna University, Chennai). ICT FOR NON-CHEMICAL AGRICULTURE PRACTITIONERS IN TAMIL NADU**

In the age of the digital divide, there is a gap between modernity and primitivism in terms of access to information. For instance, a layman can easily buy a smartphone, but the purchasing power does not decide the reach of digital divide. The age of information helps people to access not only their needs but also for excess information. The excess information may mislead or misguide the end user. Reach of the digital divide is much faster in terms of the consumerist approach to the people. This study intries to understand Development Communication. Development Communication has liberty towards the people to express their views, regardless of their problems and needs, through proper dialogues to claim issues around them. Such approaches to Development Communication lead them to play their role in the society such as problem finding, decision-making, and community development and building. India is one of the fast-developing countries; hence it requires outreach programmes through the media as part of the knowledge transfer mechanism. The government has initiated many ICT applications for farmers to improve their economy through modernity. This study focuses only on an agricultural perspective, that too in non-chemical farm practices, and its use of Information and Communication Technology applications like Digital Mandi, Agmarknet, Agriwatch, Agrinet, and Digital Green, and their reach. For this study, we choise the farmers who doing non-chemical farm practice as stratified random sampling because they are unconventional like other farmers. Due to their practice is unconventional their marketability is also needed a specific group as a target in the market. This study aims to find the reach of information technology reach such as mobile phone farm advisories to benefit the non-chemical farmers.

**0508138 CHATTOPADHYAY, ANKITA (Amity Institute of Biotechnology, Amity University, Kolkata, Rajarhat, Newtown, Kolkata). SCIENCE COMMUNICATION**

Interactions between scientists and journalism aim to furnish comprehensive, specific and “jargon-laden” information produced by scientists into a form that can be appreciated while communicating information productively along with it. Many science journalists begin their careers either as a scientist or a journalist. There are very few journalists in traditional media writing articles on evolving science with probable budget cuts in media and other newspaper being the hard mess. According to research, there are not more than 500 journalists who had written or are still writing newspapers on new inventions. Online sources are appearing to take the spot of journals. During research, it was also found that few science journalists come under criticisms for misleading report of scientific stories. There are few books written by scientists covering the topic of global warming, DDT, acid rain, ozone depletion and many more. At present we visualize “The world is online” and there is no account of keeping the controversy alive among the public arena.

**0508139 GUPTA, PARAMA AND ARAM, I. ARUL (Department of Media Sciences, Anna University, Chennai). HUMAN-NATURE RELATIONSHIP IN ‘THE COLONY(I)’ AND ‘SNOWPIERCER’ FILMS**

In recent times, especially in the last decade, films have been used as an important tool for spreading awareness about environmental issues such as climate change, water scarcity and resource extinction confronting human race at a global scale. Given that international conclaves and agreements on climate change and other environmental issues have broken headlines in these ten years more than ever before, it is an appropriate time to conduct a study that looks into the role played by a medium as powerful as films in communicating the threat of environmental degradation.

Hollywood films, especially, hold great sway with a worldwide audience including Indian film enthusiasts. Many environmental films were released post 2010 which have sought to address environmental issues in innovative ways.

The films chosen for the study are *The Colony(I)* and *Snowpiercer*, both released in 2013. The common premise shared by these two films is that both are set in a dystopian world, which is a product of extreme climate change and environmental degradation. Also, both films depict communities of people fighting together for survival in a difficult world. While narratives of a class divide even amidst common sufferings emerge in *Snowpiercer*, *The Colony(I)* tells tales of abject degeneration of humanity taking the shape of practices such as cannibalism in the face of lack of resources and epidemics. Both films end on a note of hope for a few, but largely paint a picture of doom. Thus, the two films present themselves as apt

subjects of analysis of how creative storytelling in films can communicate the graveness of the threat posed by environmental degradation to humankind.

The theoretical framework for the proposed study will include ecocriticism, the study of the treatment of environmental issues in literature and films. The study will employ discourse analysis of narrative techniques, characterisation, issues and dialogues in the films, including mise-en-scene analysis of imageries used in the films.

The findings of the proposed study will prove to be significant in identifying and understanding the trends in portrayal of ecological issues through creative media. It will also add to the understanding of narrative techniques employed through the visual medium for enhancing awareness regarding problems in our natural environment and sensitizing viewers towards their roles and responsibilities as environmentally-conscious citizens of the world.

**Keywords: Ecocriticism, film studies, environmental degradation, climate change, mass communication.**

**0508140 GURG, LEENA; SUBRAMANIAM, USHA; SAHNI, SANJUKTA; RASTOGI, ANITA AND GURG, NAVEEN (JaagoTeens, G 138 Sarita Vihar, New Delhi). HYPERLOCAL MONITORING OF CYBERBULLYING USING MACHINE LEARNING APPROACH**

Cyberbullying or writing mean and hateful comments is fairly common on the internet. A victim of bullying is not only hurt, but also experiences anxiety and might have suicidal thoughts in some extreme cases. Stopping cyberbullying is an important issue and our NGO, JaagoTeens actively works to educate children in this regard.

Manually detecting all cyberbullying messages might be next to impossible as more than 3.4 billion are on social networking sites, the most common place for bullying to happen. A popular social networking website WhatsApp has about 65 billion messages sent every day. JaagoTeens feels that machine learning could be used to flag and stop bullying content. Machine learning could be used at a hyperlocal level in social groups.

Hyperlocal is information oriented around a well-defined community with its primary focus directed toward the concerns of the population in that community. As an example, if the admin of a WhatsApp group periodically runs a Machine Learning algorithm and points out the bullying comments on the group, that could deter a bully and also discourage future bullies.

Currently, we are working on designing the algorithm and once it is available it can be adopted and tried by groups of people. A number of such algorithms are already available online, so we are also actively considering adapting one of those. We feel that a hyperlocal or community-based approach might not be very difficult to implement. It is empowering if one can take steps to stop bullying behaviour rather than just hoping that a website controlled from outside our country would take extensive steps to curb it.

**0508141 NASREEN, SHAISTA (Jamia Millia Islamia University, Jamianagar, New Delhi). DEPICTION OF ELDERLY PEOPLE IN INDIAN FILMS**

This study is an attempt to know how elderly people are depicted in certain Indian films. Few Indian Hindi movies/ films based on ageing have been analysed like Baghban, Avtaar, Saaransh, Cheeni kum, Piku etc. Results highlighted certain stereotyping projections and incidence of domestic abuse in the depiction of characters of elderly. The elderly are depicted in both favourable and unfavourable negative mode- prejudiced in-law relationships, stereotypic images of elderly, family strains. it is hard to find specific programmes aiming at issues of old age. These depictions influence the perception of how the viewers conceive the elderly, affecting the status of the elderly. The study was planned with the following objectives:

1. To analyse the status of the elderly especially based on the characters depicted in certain Indian films.
2. To assess the issues covered in films.
3. To examine their roles and relationship with family and community in the films.

Various studies show that watching TV is one of the leisure activities among elderly. Hence planning should be made to use media as a weapon to empower elderly in all aspects of life like health, economy and social life. Certain programmes which project favourable images of elderly should be telecasted. Films focusing on certain special themes e.g., programs on health and fitness, awareness of rights and responsibilities to empower elderly should be encouraged.

**Keywords: elderly people, Indian films, depiction of their relationship with family & community, elderly issues covered, status of elderly.**

**0508142 PERIYAKANNAN, K. AND SRIRAM, ARULCHELVAN (Department of Media Sciences, Anna University, Chennai). AWARENESS AND PERCEPTIONS ABOUT SOCIAL MEDIA AMONG THE CHILDREN**

Online mediums like social networking sites, Facebook and Whats App, Instagram are increasingly posing a threat to the security of children online. Online grooming, emotional harassment, cyber-bullying, sexting, social exclusion, ideological indoctrination or exposure to inappropriate content do not constitute legal offences under Indian law. With the advent of the internet, where such incidents are increasingly happen online through the public chat rooms and social media.

In this contemporary world, online is an important medium of digital communication. Children between the age of 15 and 17 access online mediums like Facebook and Whats App to access information, play games, to express and empower themselves. Online rights have a crucial role in empowering children by facilitating communication, education and social activism. However, not all the children have an equal opportunity to access online media. Subsequently, online grooming in the social networking sites poses like Facebook and Whats App risks for children. Children from higher secondary schools in Chennai are the targeted samples and the sample size is 250. The questionnaire mainly focused the following aspects such as children's awareness on abusive content, whether they have shared or discussed about online abuse with others; their participation in awareness programme concerning online abuse in their schools and finally their knowledge about the child helpline number, etc.

The hypothesis tested in this study states that children lack awareness about social media awareness. The results show that most of the children used the internet without parental guidance. Children in India are not aware of online safety and their rights. Parents and teachers do not provide information about online awareness to the children. Additionally the children are also not aware of the types of online abuse, though they are undergoing abuse through various forms. Children's inability to identify online abuse hinders the process of seeking help. It is concluded that most cases of child abuse goes unreported and it is continuing in the same way with no proper guidance by parents or teachers.

**Keywords: Internet, social media, awareness, Addiction, Children, Parents.**

**0508143 PRADEEP, K (M.Sc. Electronic Media, Narayanaguru College of Engineering, Tamilnadu). NEUROSCIENCE AND FILM: NEW DIMENSIONS OF UNDERSTANDING FILM**

A film is an amazing feat of neural and cognitive processing. A series of still pictures are projected quickly on a screen, accompanied by a stream of sound and a viewer has an experience that can be as pleasing, emotionally affecting, and memorable as many experiences in real life. In these as concern film, is a possible target of investigation for neuroscience, and for a variety of very good reasons. The present work is an attempt to develop new linkage between the film and neuroscience. This study espoused with embedded simulation theory within the methodological sense of textual analysis of selected Indian films.

**Keywords: Neuroscience, film, embedded simulation, textual analysis.**

**0508144 PUTTA, SANTHOSH KUMAR (Department of Mass Communication and Journalism, University College of Arts and Social Sciences, Osmania University, Hyderabad). PASSIVE SOCIAL NETWORKING SITES USAGE AND IDENTITY DIFFUSION AMONG EMERGING INDIAN ADOLESCENT**

Many studies have investigated social networks in the west. So far little work has been done in the Indian context related to identity construction and identity diffusion in social networking communities due to the Digital Divide. The scenario changed drastically after the recent developments in mobile communication technologies and entry of Reliance Jio infocom in September 2016 in to the Indian mobile Data market, millennial youth face new tasks in coordinating heightened capacities for social validation and autonomous expression as they process who they are during adolescence and emerging adulthood, Millennial youth face new tasks in coordinating heightened capacities for social validation and autonomous expression as they process who they are during adolescence and emerging adulthood, Now we find everyone glued to their mobile screens especially the adolescence and emerging adolescence who are busy interacting online by creating user profiles and being part of various communities on social networking sites. The virtual identities that these emerging Indian adolescent create online may not be the same as his/her identity in the physical world. By creating many rather different ( in an effort to be accepted by the members of community or in an effort to fit in to many different online communities that they are part of) identities in many social networking sites might lead to the identity diffusion which in turn delays the identity formation process in Emerging Indian Adolescence affecting their Development. At a crucial stage of development (EA) in their life. The proposed study uses Erik Erikson's stage theory of psychosocial development, James Marcia's identity diffusion as the theoretical foundations and the research methods Intensive interviews and survey as well as secondary data from other resources will be used. The results of the study will be helpful in understanding the impact/effect of SNS on psychosocial development of the Emerging Indian Adolescent and will reveal complexities of the identity formation process and how the passive usage of social networking sites is leading to the identity diffusion process thereby delaying their social development of the individual.

**Key words: Social networks, online communities, Emerging Indian Adolescent, virtual identities, identity diffusion, method of triangulation, symbolic interactionism, self-discrepancy, cyber ethnography, interviews.**

**0508145 RAMARAJ, M. AND RADHA, B (Department of Communication, Manonmaniam Sundaranar University, Tirunelveli-627012). DIGITAL OPEN REVOLUTION IN HIGHER EDUCATION: SPECIAL REFERENCE ABOUT “MOOCS”**

The 21<sup>st</sup> century witnessed an educational paradigm shift, stemming from the widespread use of Information and Communication Technologies (ICT). With the proliferation of ICT, online, open, and flexible learning affected from the edge to mainstream education. With the development of data technology, data acquisition is not simply restricted to the traditional classroom (Zheng et al., 2017). In spite of, over the last few decades the international dimension of higher education has grown up considerably as group of action has become a strategic goal for several governments (Villarini et al., 2017). In similar to follow, Indian Government has initiated many ICT based online Learning platforms to provide in higher education. It is improved the quality and capacity of the online delivery of educational content. It is used as learning spaces that are distributed, flexible, accessible, and, most importantly, potentially open. Openness in education has evolved over time and has emerged in different forms (Weller, 2014). The construction of knowledge and its socialization during this context implies intensive collaboration, reuse, remixing, redistributing, inclusion, adaptation, free access and different ideas and processes related to the notion of openness in education (Downes et al., 2013). In addition, ancient course materials like videos, readings, and drawback sets into the emerged online platforms. These platforms, MOOCs offer interactive with user forums that facilitate build a community for college students, professors, and teaching professionals. As a rising educational platform, “Massive Open Online Courses (MOOCs)” has attracted extensive attention by educational circles. Massive Open Online Courses (MOOCs) are a recent development of this open learning movement, which have drawn much attention from both the academic and the public sphere. A MOOC is defined as open, participatory, distributed, and as supporting lifelong network learning (Cormier, 2010). In some research studies has pointed out, MOOC platforms are very attracting to the young minds in higher education. In the academic arena, students’ motivation to participate in MOOCs may be a most important of interest. In this research, the factors that influence students’ motivation to be told include future economic profit, development of personal and professional identity, challenge and achievement, enjoyment and fun. Despite the fact that, premier universities have place their courses on line by fitting open learning platforms, such as edX. Commercial start-ups such as Coursera and Udacity have also been launched in collaboration with prestigious universities, offering online courses for free or charging a small fee for certification (Nagasampige et al.). According to (Classcentral et al., 2018) has published enrollment ratio that Coursera used 37 million, edX used 18 million, XuetangX used 14 million, Udacity used 10 million, FutureLearn used 8.7 million in global wide. In order to ensure the smooth progress in course teaching, many teachers adopted online teaching, which aroused wide public concern of the society. The study discovers that the quantity of the previous articles about educational study of MOOCs, presents a rising trend as a whole in the last few years. However, the following questions should be handled clearly in a timely manner: What is the current research status of MOOCs education in Tamil Nadu? How is it used by the student’s to academic process? What research hotspots does it include? When will MOOCs education develop into full swing? In order to investigate the awareness, motivation, and effectiveness of Massive Open Online Courses (MOOCs) of SWAYAM, NPTEL, edX, Coursera, Udacity and Udemy in adopted by the students. Finally, future research proposal and the methodology are presented to pull and guide the direction of relevant studies. In this research paper an attempt has been taken to study the background of the qualitative research methodology, and quantitative survey from one university from south Tamil Nadu.

**Key Words: Digital Revolution, ICT, MOOC, University Students, Tamil Nadu**

**0508146 SATHYA, K; HEMAMALINI, S AND MANIMEGALAI (Department of Visual Communication, Thiru.Vi.Ka Government Arts College, Thiruvapur). ROLE OF WHATSAPP IN ENHANCING ACADEMIC RELATIONSHIP AMONG RURAL STUDENTS IN TIRUVARUR**

WhatsApp has become a prominent medium for youngsters in recent days especially for sharing and interacting among the masses. Existing youngsters are progressively using technology for their education. In particular, students in rural area are found to use WhatsApp for their progress. Tiruvapur is a rural district comprising of 1267 schools and 25 colleges out of which 6 are government arts and science colleges. Youngsters in rural colleges are also found to use WhatsApp at most times. This study features WhatsApp as a bridge to fill the

gap between teachers and students helping them at all times. The platform is found to help interaction among the class students with their teacher in respect to academic activities even after college working hours. This study is also approached through Technology acceptance theory explaining the level of technology accepted by the rural students. Survey is administered among 100 students and 25 staff, selected through probability sampling. Structured Questionnaire was utilized to collect the requisite data. This study propagates the use of technology to enhance academic performance and also to create a better environment for the students to come out of their cocoon space and interact. The teachers find the application to be helpful in mentoring the students apart from academics. It also exhibits positive student-teacher relationship with implicates mentoring process effective.

**Key words: Whatsapp communication, Academic performance, Rural district, Technology Acceptance Theory.**

**0508147 SHAIK, MOHAMMAD SHAMEER (.....).SOCIETY AND JOURNALISTS CONDITIONS**

The society consists of all professions and journalist profession is considered to be a noble profession because it got the sanctity of protecting democracy. The editors/reporters become part of the ruling elite and become brand ambassadors for their newspapers/ Television. The competition among news channels put enormous pressure on journalists. This study aims at investigating the working conditions of journalist in Hyderabad. Hyderabad is a hub centre for Television News Channels in South India. The findings revealed that majority of journalists satisfied to be a journalists. Respondents feel that journalistic unions some what protects journalist interest. The young journalists enjoying more freedom and happy to be a journalists, where as editors have limited professional freedom and satisfies with their position. The majority of sub editors were found to be happy with their salalry and professional freedom.

Mwesige (2004) observed that national portraits of journalists are important because journalism is deemed to be a central influence on society India is the largest democratic country in the world. Journalists were not given a free hand in broadcasting news, some time caste plays major role in allotment of particular beats/desk to the journalists (Shaw, 2017). As per the World Press Freedom Index, India ranked 136th out of 180 nations worldwide in 2015 (up from 140th in 2013), which still indicates significant struggles for an independent media environment (Desai, 2017). Lealand et al. (2007) revealed that more than half (55%) reported that newsrooms had been pressured to do a story because it related to an advertiser, owner, or sponsor. A Reuters institute study (2017) revealed that more people actively avoiding news because it had a negative effect on their mood, and they cannot rely on the news to be true. These factors also led to know why journalists are not able to keep the faith of viewers/readers. The press considered as one of the pillar of Indian democracy. The fourth estate in the country. The Indian press has the freedom of expression under the article 19 (a) guaranteed by the Constitution of India. Initially Doordarshan lauched with aim to education the people. The Doordarshan monopoly come to an end after new reforms in the nineties. The globalization changed the economic situation of the country. Satellite uplinking and downloading facility provided from the Indian soil. Private player entered in the broadcast. Many news and current affairs channels started broadcasting and at present there are more than 400 news channels. Now, news channels manufacturing news by the way of holding studio discussions. The competition among news channels put enormous pressure on broadcast journalists. The journalists role become more diplomatic, he has to give more update without hindering affiliate business partners of the news channels. Bharat Bhushan (2015) highlighted that Changing role of the editor what became of the editor in this process? Those so inclined to be editors became brand ambassadors for their newspapers. They were expected to rub shoulders with the powers that be in the world of politics and business and essentially show that they were not at variance with their own worldview to those of the owners and advertisers. From being daily reporters and interpreters of history, the editors became part of the ruling elite and were expected to highlight the elitist value systems. Editors and reporters experience higher level of pressure than those in other roles. Other work related factors associated with level of burnout include increased work-family conflict and workload, reduced capacity for innovation and autonomy in the workplace, low level of perceived organizational support, income, involvement, peer cohesion, task orientation and physical comfort in the workplace (Jasmine B et al 2016).



A number of media houses have been capriciously close down editions and channels retrenching journalist and non-journalist staff, but there is little coverage in the media about it. The Working Journalists Act of 1955 laid down service conditions for journalists. The act followed the recommendations of the Press Council of India covering a minimum notice period, gratuity, provident fund, settlement of industrial disputes, leave with pay, hours of work and minimum wages. In cases of cutback, under the act, the minimum period of notice is six months in the case of an editor and three months in the case of any other working journalist—not four days, or even two months (Samrat, 2017). In 1993, a media contract system was introduced (Desai, 2017), which reduced journalists' bargaining power. Interestingly, wage boards do not apply to the electronic media (ABP Pvt.Ltd.& Anr.Vs Union of India & Ors., case, 2011).

The Supreme Court of India in its 2014 judgment, also upheld the government notification accepting the recommendations of the Majithia Wage Board. Under this, newspapers were classified based on their gross revenue into eight classes ranging from Class I (those with revenue above `1, 000 crore) to Class VIII (those with revenue below 1 crore). The wage board made recommendations on wages for both full-time and part-time employees, as well as on allowances such as house rent and transport, that varied with the size of the organization and the location, in case of allowances (Supreme court report 2015).

Hindustan Times news paper's editions and bureaus in Kolkata, Bhopal, Indore, Ranchi, Allahabad, Varanasi and Kanpur were being "shelved" from 9 January 2017. The implications of the word "shelve" were not explained. There was no clarity on what would happen to the many journalists and support staff who worked in all these offices (<https://www.newslaundry.com/2017/01/06/hindustan-times-is-shutting-down-four-editions>)

In Telugu region, Hyderabad based satellite news channels, Zee Telugu news, Gemini news, 6tv, Express tv, studio one, and Rk news close down.

According to data compiled by the Committee to Protect, out of 1305 journalists worldwide, 47 journalists have been killed in India since 1992. Incidents like the murder of Shujaat Bukhari (Kashmir), Gauri Lankesh (Bangalore) and Sudip Dutta Bhaumik Tripura and Navin Singh and Vijay Singh in Bihar, and Sandeep Sharma in Madhya Pradesh explain the gravity of heinous crimes.

**0508148 SINGH, SWETA (University School of Mass Communication, Guru Gobind Singh Indraprastha University). MAPPING SOCIAL MEDIA DISCOURSE ON 'ABROGATION' OF ARTICLE 370**

On August 5, 2019, the Indian government 'abrogated' Article 370 and the state of Jammu and Kashmir was bi-furcated the State into the union territories of Jammu and Kashmir and Ladakh. The Article allowed the state a certain amount of autonomy -- its own constitution, a separate flag and freedom to make laws. As the Article got revoked, the democratically elected leaders were put under house arrest and made incommunicado. Heavy additional Indian troops were deployed, schools and colleges were shut and telephone and internet services were suspended. Some termed the revocation as an existential crisis for the State and a danger to the federal structure. Journalists sourced their stories on pen-drives that were sent through those who flew out of the state. The move followed an immediate clampdown on all communication in most parts of the state leading to a complete blackout of news from the region. It has been argued that this kind of a lockdown is unparalleled in the history of conflicts, as even during Arab Spring, the crackdown on communication was not so massive. The situation was termed a 'virtual siege'. The discourse on the mainstream media about the constitutionality of Article 370 and what lies ahead for the region reflected nationalistic perspective that was close to the government's agenda. Because there was no communication from the state, social media platforms such as Twitter, Facebook and YouTube helped in filling the communication void partially through the reactions of individuals outside Jammu and Kashmir and the sharing of reportage by both the mainstream and independent journalists on these social media platforms. The mainstream media's emphasis on how scrapping of Article 370 will lead to development got extended on the social media platforms as well. The social media sphere, however, gave vent to the critics who disagreed with the argument that the trifurcation of the state will bring development for its people. Social media also helped mobilise Kashmiris who wanted to reach out to their families and relatives in different parts of the country and abroad. The Kashmiris shared their concerns, anger and anxieties through these online platforms while allowing the space for the Kashmiris to articulate their anger and hurt. The feeling of betrayal was palpable in the limited reactions that emerged on these platforms. This research

studies the contribution of social media in furthering the discourse on Article 370 after its abrogation by analysing the conversations on Twitter, Facebook and YouTube.

**Keywords: Jammu and Kashmir, Article 370, social media, India, propaganda**

**0508149 TIRUPATHI, BOLLAM (Department of Journalism & Mass Communication, Osmania University and Senior Journalist, Hyderabad). SOCIAL MEDIA IS THERE TO STAY**

A fascinating aspect of Social Media is that it has amalgamated media forms like text and image; audio and video. This paper will seek to highlight how this new form of the media has transformed our lives. It is a known fact that the social media has contributed to the overthrow of entrenched dictatorships due to its facility to keep people better informed and stay more connected. The social media is changing the ways in which we think, and act. Unfortunately, there is a risk of our brains being numbed and adversely impacting our mental faculties. In the conventional print and electronic and print media, there is some sort of editorial control to check whether the matter being put out is safe for 'public consumption'. On the other hand, any person having access to a smart phone or an Internet connection can become a journalist and transcend vast geographical boundaries in a matter of seconds.

The potential of the social media was very succinctly brought out by 'The Economist' in its cover story, 'Do Social Media Threaten Democracy?' in 2017, when it commented, "Not long ago, social media held out the promise of a more enlightened politics, as accurate information and effortless communication helped good people to drive out corruption, bigotry and lies. Far from bringing enlightened, social media has been spreading poison. By spreading untruth and outrage, corroding voters' judgment and aggravating partisanship, social media erode the conditions that foster liberty.

**0508150 VAMANAN, KAVITHA (Journalism and Mass Communication, Vivekananda College, Agasteeswaram). VISUAL INTERPRETATION OF PRINT ADVERTS: SEMIOTIC VIEW**

Visuals although alluring they convey plethora of meanings simply than text. In this advertised world, adverts convey powerful messages alongside with their brands. Most adverts focus on to the support of existing social issues thus creating awareness by appealing visuals in influential way. The purpose of this study is to analyse the visual interpretation of adverts and the portrayal of environmental issues linked with the print advertisements. Three sets of World Wildlife Fund print advertising campaign ads are reviewed using semiotic analysis. The output of the study will put forth the emotionally connected messages carried out by the print advertisements. In addition, this study spread awareness on environmental issues portrayed in print media through advertisements visually and extends instant action-based approach to protect the planet.

**Keywords: Visual, Message, environmental issues, semiotic, emotional**

**0508151 VENKATLAKSHMI, K (.....). SOCIAL MEDIA MEMES: IS IT A CULTURAL ASSIMILATION?**

In the present era of fast paced communication, youngsters spend most of their time by using social media with centre of attraction being social media memes. Social media memes not only attract youngsters in many ways, but also attract all sections of society because of its messages which is a combination of both humor and creativity. Most of the times, there lies a big question about the content and individual criticism being done on social media. This survey study makes an attempt to analyze the views of youngsters concerning social media memes and finds out whether youngsters consider these memes as a source of entertainment or as an important source of valuable information. Around 100 youngsters participated in this survey and most of them said that they consider memes as means of entertainment as it creates humor and they do not take it seriously. However, the memes try to send out social information to the youngsters thereby addressing and highlighting the social problems that happen in the society. Hence, the outcome of the study proves that the memes not only entertain youngsters but also make them think about the society they live and the youngsters do respond to the memes in a positive way thereby creating a positive impact on the society

**Keywords: Memes, social media, meme creator, issues, youth, politics.**

**0508152 YADUNANDAN S R AND LALMOHAN, P (Media Studies, Thunchathezhuthachan Malayalam University, Tirur, Malappuram, Kerala). MEDIATION OF FACEBOOK LIVE AND THE LOCAL SENSORIUM OF MALAYALI DIASPORA IN GULF**

Sensorium is unparalleled in the context of human experience. Daily experiences are communicating with the deeper structures of sensorium. Experiences are stored in the form of memory which ultimately becomes the part of sensorium. Sensorium cannot be limited in a space but it is actively being followed even if the individual is separated from a particular space. This research paper explores how the Mediation of Facebook live which is a newer form of Facebook communication method deals with the sensorial experience of Gulf migrants from Kerala. This form of communication method has close resemblance with the concept of mass-self communication model put forward by noted social science researcher Manuel Castells (Castells, 2000). Local Sensorium is the byproduct of the whole sense experience of an individual within a locality. In the context of diaspora the process of de-territorialization limits an individual's physical connection with their local sensorium. Even though a person is de-territorialized from their locality the process of mediation remedies with their locality. The concept of production of locality been defined by noted social science researcher Arjun Appadurai is also critical on defining a diasporic individual's active involvement with their homeland. Appadurai defined mediating practices of new media as the networked forms of locality and defined the concept as virtual neighborhood (Appadurai, 2000). Sensorium shows the character of deep structure in its analysis. That cannot be limited to a quantitative pre-determined research approach. Qualitative research approach is adopted in the study. Qualitative research approach conversation analysis method had adopted for the study. Conversation analysis method has the quality to reveal deeper information regarding a research area. The method is specific in the sense that it can reveal the relevant data regarding the research area (Flick, 2005). Conversation analysis method had been conducted among 6 individuals who are migrated from Kerala to Gulf Countries. This study explores the mediation of Facebook live and the local sensorium of the people who are migrated to Gulf countries from Kerala.

**Keywords: Mediation, Facebook Live, Locality, Sensorium**

## 09. COMPUTER SCIENCE

**0509153 LAL, MANOHAR (KAUSHIK) AND SRIDHAR, MEENAKSHI (SOCIS, IGNOU, New Delhi) COMPUTING SCIENCE & RELATED INTELLECTUAL PURSUITS IN ANCIENT & MEDIEVAL INDIA: SOME HISTORICAL & CULTURAL ASPECTS**

Current contributions to an academic discipline are outcome of intellectual traditions and individual contributions by generations of intellectuals spanning over, possibly thousands of years. The same is true about contributions, in the previous 20-30 years, to research in computing and computer science. Though the terms 'computing' and 'computer science' are new, yet their idea and practice have long history in India, China, Egypt, Mesopotamia and Greece, extending to at least 2500 years. Greek Logic and formalisation tradition and Indian tradition of algorithmic problem-solving form two of the four pillars of the current computer and information (ICT) revolution. Algorithmic problem-solving has been one of the foundations of Mathematics; and Logic, a part of philosophy, forms the basis of Euclidean Geometry. Principles of the third pillar of computing viz. of Linguistics, first propounded in Panini's Ashtadhyayi—compiled at least by 5<sup>th</sup> BCE, and which is paradigm of formal and succinct representation of information—serve now as model for designing programming languages and also for designing Information systems. The fourth pillar viz, electronic and optical communication technology is rooted in modern times in the West. For proper understanding and evaluation of current contributions, it is essential to have basic knowledge of (i) the history of previous relevant contributions, (ii) conceptual & methodological frameworks of the discipline of Computing, and (iii) social aspects of computing including applications and implications of the

current ICT revolution. **The discussion on ‘Computing’ is too long for a single paper, it is distributed over the following three papers** (including the current one)

- (i) Computing Science & Related Intellectual Pursuits in Ancient & Medieval India: Some Historical & Cultural Aspects,
- (ii) Computing-related Developments in India and Contributions by Indians in Modern Times [1],
- (iii) Conceptual Framework for, and Applications and implications of, ICT revolution [2].

**Keywords: Computing, Computer Science, Informatics, Computational, Information, IT, ICT, Linguistics, Algorithm, Meta-Language, Meta-rule, Recursion.**

**0509154 SRIDHAR, MEENAKSHI AND LAL, MANOHAR (KAUSHIK) (Department of Computer Science, Rajdhani College, University of Delhi, New Delhi). COMPUTING-RELATED DEVELOPMENTS IN INDIA AND CONTRIBUTIONS BY INDIANS IN MODERN TIMES**

In this paper, we have traced the history of computing in modern India, mainly from research and academic point of view, starting from around 1850 when, in the modern times, the academic institutional framework was started being laid for later computing & IT revolution. In section 1, we discuss how some visionaries—when the first computers were being designed & developed anywhere in the world—could foresee the significance of computer in academic and economic developments of India. In the next section, it is discussed how (academic, non-computing) institutional framework in India was laid since around 1850. In section 3, all the major issues, including infrastructural, institutional and academic but, except research contributions to computing by Indians in modern times, are discussed. Finally, in section 4, the topic of Research contributions to computing by Indians in modern sense and/ or times is discussed.

## 10. EARTH SCIENCE

## 11. ECOLOGY AND ENVIRONMENTAL SCIENCE

### 0511155 AMRUTHA, M. K. (National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore). A WALK THROUGH THE SACRED GROVES OF KERALA

Over the past few years, we have witnessed unprecedented changes in climate. Heavy downpour resulted in floods and landslides in South India during the last monsoon and extreme drought during summers. It is high time that we discuss the issues of climate change. Changes in the land use pattern in Kerala over the last decade is very evident from the satellite images and many studies<sup>2</sup> reveal the drastic decline of sacred groves in Kerala. *Kaavu theediyal kulam vattum*, (The ponds will dry up when the ecology of the sacred grove is disrupted), a Malayalam proverb that aptly represents the present scenario. This paper attempts to study the sacred groves of Kerala and to see how sacred groves are helpful in maintaining the delicate balance of nature.

Sacred groves are great repository of many endemic, endangered and medicinal species and they support immense diversity of life forms. These thick green patches of land engulfed with climbers and creepers with the chirping of birds and buzzing of bees are showers of hope for the future. Active participation of local people and their indigenous knowledge on sacred groves are valuable for biodiversity conservation. Various rituals associated with the folk performances help to safeguard natural resources and play a crucial role in rescuing the last shelter of biodiversity. Local communities have been preserving these tiny patches of forest in the name of god.

Decades ago there were thousands of sacred groves in Kerala, but many have disappeared and some are on the verge of extinction. Sacred groves could be owned by a community or it is private property, in both these cases, sacred groves face serious threats. Changes in the family system also lead to the destruction of the sacred groves. It is very difficult for these tiny patches of land to resist further encroachment. This is a study based on the fieldwork experiences in the sacred groves of Kerala, particularly focusing on the Malabar region.

The introductory section will focus on the traditional image of sacred groves of Kerala, where the isolated patches of self-sustainable ecosystems become sacred. The first section of the paper focuses on the unfortunate consequences after the encroachment on the sacred groves due to urbanisation. The second section will focus on the role of ritual performances in protecting and preserving the sacred groves and the recent changes in the performances which have once nurtured these sacred groves. The third section of the paper studies the need to preserve sacred groves in the present times. The final section will focus on the question of why it is necessary to walk through the sacred groves.

**0511156 HUBBALLI, RAJAT B; MUNINARAYANAPPA, M AND KUMAR, ABHISHEK S (Bengaluru central University, Bengaluru-560001). CLIMATE CHANGE AND IMPACT ON MODERN LIFE STYLE**

Greta Thunberg, a 16 year old girl from Sweden has gathered major attention of leaders from across the globe on one of the most significant topic at an international level called “**Climate Change**”. Although her campaigning received major criticism by a few leaders from across the globe, Greta’s message is simple, “Humanity is facing an existential crisis due to Climate Change and humans are responsible for it”. This is not something that we are not aware of but something that we do not act for.

For a country like India where agriculture is the backbone of the entire system, the yield of crop tend to reduce and have adverse impact on the life of the crop as well as the farmer due to these erratic climate changes.

There’s none denying that climate change is a result of an umpteen number of reasons, both natural and man-made. Though we cannot really do much about the natural causes, it’s a shame to say that the man-made reasons contribute to a larger extent towards it. Human in his quest for wealth, fortune and fame has very evidently ignored and exploited the resources provided by this evergreen nature. The concept of “Live and Let live” is gradually but steadily disappearing due to human’s greedy and disastrous activities performed by exploiting the resources made available to us. Exploitation of natural resources is an understatement in this context. This phrase here speaks volumes about the disastrous treatment meted out to mother earth. There is plethora of ways through which humans have exploited the earth. Few of them being Deforestation, extraction of oil and other natural resources, use of plastics, emission and release of toxic and hazardous chemicals.

We have been blinded by our mundane activities in our daily lives due to which we have blatantly ignored the current position of our ecosystem. As much as the humans deserve this beautiful earth, an equal share is deserved by the plants animals and other species in the ecosystem. But the greed of man has spared none and pretty much wiped out this beautiful nature.

At the end of the day, human greed has taken a massive toll on them. Due to the inadvertent human activities the temperature of the earth has taken a steep rise resulting in spells of draught, floods, steep rise in sea levels and unbearable heat waves in major parts of the country, thereby claiming the lives and livelihood of a number of people across the country. The cases of malnutrition, low immunity and rising risk of diseases are substantially increasing. Methodologies basically used from secondary data of summit resolutions, research papers, survey reports and articles of national conferences.

It is high time that we start accepting the fact that the beauty and greenery of the earth is deteriorating rapidly and if we don’t react and respond soon, we will all be reduced to ashes at some point in the near future.

**Keywords: Disastrous Activities, Toxic, Species, Deteriorating, Inadvertent Human Activities**

**0511157 JAGANNATHA, V. (FMCCWP, Shri D Made Gowda, Ex MLC, Patron, FMCCWP).  
DECENTRALISED COMMUNITY CENTRED PRACTICES : A CASE STUDY ON MYSURU  
CITY**

Municipal Solid Waste (MSW) Rules 2000 has been a watershed in Urban Management in India. In line with Earth Summit 1992, 73<sup>rd</sup> and 74<sup>th</sup> CAA Constitutional Amendment 1992 has provided at the 13rd Schedule provides 18 responsibility for Village Panchayats and Urban Local bodies. SWM source segregation, collection, transportation, treatment and disposal for domestic solid waste management are statutory requirements. Further, the recent MSW Rules 2016 provides for stringent penalties. It has been a poor enforcement for lack of political will and ecological illiteracy. Oct 2, 2019 as a UNEP commitment by India has been a case of on one time plastic and paper abuse has been a case. Three year time for compliance to MSW Rules 2016 as in case of MSW Rules 2000 has diluted scope for ecological security. The new Rule provides for every noncompliance of one time plastic abuse a severe penalty of 6 months imprisonment and 25 thousand to 5 Lakh fine is tenable.

The genesis of Swachha Mysuru programme since 2014 by Govt of India is a case. In the past over a decade and half state Govt had held Nirmala Nagar, ADB and JnURMS of the 2000 have shown a value addition in general towards Sustainable Cities United Nations Sustainable Development Goals UNSDG 2030.

In the early 1990s Nirmala Nagar Programme a flag ship programme could get evolve a Solid Waste Policy by the DMA, Govt of Karnataka. Eight sectors of focus were covering issues of water, solid waste, finance management and community empowerment. Later in the 200s Asian Development Bank supported the infrastructure covering a Central Solid Waste Central Processing Plant 200t/day in addition to Water Resources Augmentation, Storm Water Management and Ring Road and Lakes Management. Later, under the JnURMS mission of GoI boosted capacity in infrastructure. Physical erection of 9 m Zero Waste community centred plants are significant ones.

In this presentation, the benefits of Heritage, Culture, Educational, 2<sup>nd</sup> Tier Industrial and ecologically evolving city is made for the recent 15 years of sustained actions are unique developments. Community Participation being active has been awarded various national level Swachha Awards. In future, lack of a Vision, Agenda and Action Plan for yet to be handed over 73 layouts and over 760 approved layouts are focused. The working details and capacity building of 9 Zero Waste Manpower, machinery and monitoring system are reported. FMCCWP runs ZWM plants and Recipient of Swachhata Hi Seva Honor by MoHUA, GOI 2016. Mysore City Corporation support FMCCWP with about Rs 90,000 for salary and over Rs 15K per month is generated by sale of over 28 categories of dry waste. The need of a capacity building of all 9 Zero Waste Management ZWM are projected along with health care and socio- economic conditions of the Nagara Bandhus(PKs). ZWM are also Climate Resilient Micro financed good practices also.

**Key Words : MSW Rules 2000 and 2016, Zero Waste Plant, Swachha Bharat, Nagara Bandhus(PKs)**

**0511158 KASHYAP, MAHESH (Centre for Sustainable Development). HOW TO DEAL WITH THE  
SILENT KILLER?**

Air pollution is a silent killer. One cannot see air pollution directly most of the time but it is causing damage to the health of human beings in the form of cancer, cardiovascular diseases, dementia, respiratory problems and high mortality rates. Young children and seniors are the most vulnerable to the ill effects of air pollution. Out of 20 cities in the world that are highly polluted, 13 are in India. Cities such as Delhi are witnessing increased air pollution and other cities are catching up. High population density is a huge contributory factor of air pollution in cities and urbanized areas.

Air pollution has taken centre stage now as awareness is slowly increasing due to issues in the national capital. Short and long term strategies to reduce air pollution for Bengaluru and other cities must be developed to

address the issue before things get out of hand. In the state of Karnataka, Tier II and III cities are left behind as all the work is concentrated in Bengaluru.

Air quality monitoring and pollution inventory are the main aspects in examining the pollution issue. Importance of these two aspects will have to be considered to come up with strong policies to combat air pollution. Recent sampling and monitoring activities at different locations in Bengaluru will be presented to show the extent of air pollution in the city. Currently the attention is on common air pollutants such as Sulphur and Nitrogen Dioxides, Particulate Matter, Carbon Monoxide, Ozone and Hydrocarbons. What is required is to address the issues related to toxic pollutants such as heavy metals, PAH, PoPs that can cause more damage to the human health as compared to the common air pollutants.

**Key words: Health, Air Emission, Air Pollutants**

**0511159 LAKSHMI, K R AND JAGANNATHA, VENKATARAMAIAH (135,22nd Cross, 3rd Stage, D block, Vijayanagar, Mysuru) ECOLOGICAL ILLITERACY AT ITS BEST: ABUSE OF A FEEDER CANAL TO KARANJI LAKE MYSURU URBAN**

“Lakes are eyes of the earth” vision by Henry David Thoreau in the 19<sup>th</sup> century is pioneering understanding relevant to harmonising human life with urban lakes. International lake environment committee UNEP has embarked upon conservation and management of lakes with specific principles for all types and scales of lakes. Government of India and state government have specific actual plan for conservation and management of urban lakes need for both economic and ecological benefits. A unique developmental focus for lakes was made on lakes by Asian Development Bank and KUIFDC for conservation and management five lakes at Mysuru during 2004. This was a spin off benefit for a public outcry on lowered ecological priority in urban development for urban lakes in Mysuru.

A concept report for restoration of 5 urban lakes at a cost of Rs 6 Crores at Mysuru was taken up during 2004. For the first time the concept report had attempted using SENCLE model of ILCE. However, after one and half a decade ecological illiteracy has been evinced in conservation of feeder canal plant built during the time of maharaja. It could be suggested that ecological lower priority “**Dhanapishachi**” in urban development has endangered the lake the eye of the earth. A change in attitude at all levels including community, institution is recommended. In this paper, the status of the feeder canal to Karanji Lake which lead to Chamundi Hill at every 100 M is documented and analysed for restoration. Ecological status of Karanji Lake using the ILEC UNEP simple format is reported.

**0511160 MAHADEV, J; SUGEETHA, G; PANKAJA, N S AND SHIVAKUMAR, K V (Department of forestry and Environmental Science, Entomology, Pathology and Crop Physiology College of Agriculture V.C.Farm, Mandya). COMPARATIVE STUDIES OF ALGAL FLORA WITH REFERENCE TO PHYSICO-CHEMICAL PARAMETERS IN FRESH WATER HABITAT**

Comparative study of algal flora with reference to physico-chemical parameters from seven lakes of in and around Mysore district has been studied. The IDSE/S diatoms index is calculated using the Garrett ranking technique. Nestedness of species in the lakes was also determined using the nestedness calculator. According to the palmer index all the seven lakes are organically polluted, Bogadi Lake was least while Dadadahali Lake and Karanji were polluted. The present work compares the use of old and new techniques of detecting water quality. It also enables to understand whether algae can be of importance in conserving organically polluted lake waters. The nestedness analysis helps in detecting the autoeathonous algae in each lake in contributing to organic pollution. The species index indicated that Kabini Lake and Bogadi Lake had low organic pollution. The diatom index showed that all lakes ranges between moderate and high organic pollution, but the degradation levels in the water was always high in Dadadahali lake has the highest organic pollution. Species of *euglena* and *scenedesmus* were the most tolerant species. Algae were highly nested in Dadadahalii Lake. Dalvoi Lake, Karanji Lake was most hospitable sites for growth of algae while most of the other lakes have idiosyneratic species. The matrix fill was low and the



system temperature was warm indicates poor distribution of algal species. The use of modern tools in determining levels of organic pollution in lake ecosystems has been discussed.

**Key Words: Limnology, Lakes, Algae, Diversity index**

**0511161 MAYACHAR, K SHILPASHREE AND NANDINI, N (Department of Environmental Science, Campus, Bangalore University, Bengaluru-560056). INDOOR AIRBORNE BACTERIAL ENDOTOXIN IN URBAN PUBLIC SPACES**

Urban society spend most of their life time in indoor enclosed spaces, therefore indoor environmental conditions play a significant role on human health. Indoor air quality is influenced by many factors such as building type, location, ventilation systems, type of occupants and outdoor environmental condition. Indoor public spaces such as schools hospitals, libraries, theaters etc., were reported to have higher concentrations of air pollutants like carbon dioxide, carbon monoxide, airborne fine dust particles, pollens, fungal spores, bacterial aerosol and bacterial Endotoxins. Inhalation of Endotoxins at lower levels ( $\text{EU}/\text{m}^3$ ) may pose serious respiratory symptoms in immune depressant peoples. The present study is aimed to isolate and quantify air borne bacterial endotoxin in selected indoor urban public spaces. Endotoxin is a Lipopolysaccharide (LPS) of Gram negative bacteria which is component of bacterial cell wall. Most of the toxicity of LPS is due to hydrophobic lipid "A" moiety. LPS molecule is composed of O-antigen, outer core, inner core and lipid A. lipid A is a glycolipid moiety which contains 2 and 3-Hydroxy fatty acid (3-OHFAs) which have been used as a chemical marker. The presence of bacterial endotoxin in indoor air deteriorates the quality of breathable air triggers immune system resulting in allergic Asthma in building occupants. The endotoxin gets associated with particulate matter less than  $2.5\mu\text{m}$  size and upon inhalation reaches alveoli resulting in inflammation and septic shocks. Therefore present study has isolated and quantified airborne bacterial endotoxin in Indoor public spaces such as health care centers, auditoriums(AC), libraries, seminar halls and toilets in Bangalore University (BU), Jnana Bharathi campus for the period of one year between December 2017 to November 2018. Sampling and isolation of air borne endotoxin was carried out by methods prescribed by ASTM (2007) E 2144-01. The quantification of air borne endotoxin associated with particulate matter less than  $2.5\mu\text{m}$  size was carried out by gas chromatography (GC-FID) method. The mean endotoxin levels in health care centers was recorded as  $190 \text{ EU}/\text{m}^3$ , similarly in auditorium it was recorded as  $36 \text{ EU}/\text{m}^3$ , in library mean endotoxin levels were recorded as  $160 \text{ EU}/\text{m}^3$ , in seminar hall and toilet the mean endotoxin levels were recorded as  $20 \text{ EU}/\text{m}^3$  and  $200 \text{ EU}/\text{m}^3$  respectively. The levels of Endotoxin are found to be higher DECOS, 2011 occupational safety limit of  $90 \text{ EU}/\text{m}^3$  except auditorium and seminar hall. The increase of endotoxin levels may be due to proliferation and denaturing of gram negative. Gram negative bacteria were contributed by infected patients in health center, flushing in toilets aerosolize Endotoxins which are present on toilet seats, paper parchment in library and dust presents on walls of the indoor environment which houses gram negative bacteria or from solid waste dumpsites near vicinity of sampling sites.

**Keywords: Indoor air, microbial pollution, endotoxins, public spaces**

**0511162 PRAKASH, K L; SHRIDHAR, D M AND RAVIKUMAR, P (Department of Environmental Science, Bangalore University, Bengaluru-560056). LEACHATE CONTAMINATION OF GROUND WATER AROUND MANDUR SOLID WASTE DUMPING SITE, BANGALORE**

The leachate and ground water samples were collected randomly around the municipal solid waste dumping at Mandur. The samples were analysed for pH, hardness, electrical conductivity, total dissolved solids, alkalinity, calcium, magnesium, sodium, potassium, chloride, nitrate, sulphate, phosphate and heavy metals like copper and nickel using standard methods during pre-monsoon season. Geologically, the area is underlined by granites and fractured laterites are influences the explosion movement of pollutants into the groundwater. The results of ground water samples were revealed that most of the parameters were exceeding limit as per BIS (10500-2012) Drinking Water Quality Standards, indicated the interaction with the leachate and ground water samples near the core zone and are most affected by the leachate of Mandur solid waste dumping site. The ground water sources are not suggest for drinking as various water quality parameters are above the permissible limits but, the groundwater can be used for agricultural practices.

**Key Words: Leachate, Ground water quality, Solid waste dumping site, Percolation**

**0511163 RAGHAVENDRA, M M; NANDINI, N AND KUMAR, M (.....). WATER QUALITY STATUS OF ARKAVATHI RIVER BASIN, KARNATAKA, INDIA**

Water quality is affected by a wide range of natural and human influences. The surface water quality in Arkavathi river basin has been affected by both point and nonpoint sources of pollution. Water samples were collected from 15 locations across the Arkavathi River in the year 2019. Physico-chemical parameters like, pH, EC, TDS, DO, BOD, COD, Chloride, Total Hardness, Sulphate and Phosphate was determined by following standard methods prescribed by APHA 2012. The results were compared with IS Standards 2296-1982. The result of physico-chemical analysis of river water depicts that, most of the parameters were found to be beyond the permissible limits of IS standards. The findings clearly indicate that the river is highly polluted due to discharge of untreated wastewater.

**Key words: Arkavathi river, pollution, surface water, water quality**

**0511164 SATHISH, SAVINAYA MALVE; JOGATTAPPA, NARAYAN AND VENKATARANGAIAH, KRISHNA (Department of P.G.Studies & Research in Environmental Science, Jnanasahyadri, Kuvempu University, Shankharaghatta, Shivamogga). A STUDY OF IMPORTANCE OF NON-TIMBER FOREST PRODUCTS IN SOCIO-ECONOMIC DEVELOPMENT OF FOREST FRINGE COMMUNITIES IN RAMESHWARA DEVARAKADU OF SHARAVATHI RIVER BASIN, CENTRAL WESTERN GHATS**

The forest fringe communities in remote villages of Western Ghats depends on Non-timber forest products (NTFPs) for their livelihood and make use of forest resources for both economic and day to day needs. Assessing the trade and usage of available NTFPs within the country is essential for an accurate appraisal of their true socio-economic contribution to sustainable development. An attempt has been made in the present study to weigh up the contribution of NTFPs to income and employment of harbouring communities of Rameshwara Devarakadu located in the region of Sharavathi river basin, Central Western Ghats. The present study reveals the record of 81 species of NTFPs distributed in 69 genera of 45 diverse families. The local communities utilized floral wealth for various purposes such as dry/green leaves (81 sp. / 26 sp.), ethno-medicines (56 sp.), wild edible fruits & leaves (22 sp.), resin (01 sp.) and also as a source of income (07 sp.). In addition, honeys have been collected for both self use and economic benefit. The study found out NTFPs contribution to the additional source of income to improve their socio-economic conditions. Hence, to sensitise the usage of NTFPs without compromising the conservation of natural ecosystem, the study emphasizes the sustainable accession of NTFPs through scientific extraction channel.

**Keywords: NTFPs, Sacred groves, Sharavathi river basin, Western Ghats**

**0511165 VEENASHREE; NANDINI, N. AND KUMAR, M (Department of Environmental Science, Bangalore University, Jnana Bharathi Campus, Bengaluru-560056). CARBON SINKING POTENTIAL OF PHYTOPLANKTON IN BENGALURU LAKES, INDIA**

Freshwaters bring a prominent contribution to the global carbon budget by sequestering the carbon dioxide and lakes specifically plays an important role within the processing and transport of terrestrially fixed carbon to the lake depth creating sink to the atmospherical carbon. The lakes are the home to enormous populaces of simple eukaryotic organisms known as phytoplankton or algae. These algae form the base of the aquatic food chains and is the key indicators of the efficiency of aquatic environments. Phytoplankton richness and composition are influenced by the spatial and temporal dynamics of environmental factors. The quality of water may be delineated by enumerating the plankton characteristics. phytoplankton play an important role in sequestering carbon dioxide which disbands into the lake from the atmosphere, through photosynthesis, and carbon dioxide thus produced is consumed by phytoplankton and few carbons are carried to the deep lakes when phytoplankton perish and some is transferred to different layers of the lakes.

Bengaluru is an urbanised city in south India known for its salubrious climate due to the presence of range of lakes. It is also referred to as city of lakes however off late the lakes of Bengaluru have vanished and the disappearance of these lakes started in the 80s but has sped up with rapid urbanization. While in 1961 there were 262 lakes, official statistics today mention 117 lakes, but only 33 lakes are still more or less visible on satellite imagery. Bangalore supports no natural wetlands, the present one's were built mainly for various hydrological purposes and to serve the needs of irrigation and drinking water supply but anthropogenic activities such as uneven draining of industrial effluents, domestic sewage, agricultural practices and fertilizers run offs has disrupted the normal functioning of lake ecosystem. The present study was carried out to assess the carbon sinking potential of aquatic plankton's in Bengaluru lakes and the total number of phytoplanktons recorded in the lake water samples were 133 of which 41 (31%) Bacillariophyceae, 21 (16%) Cyanophyceae, 68(51%) Chlorophyceae, 3 (2%) Euglenophyceae. These planktons influence the exchange of gases between the atmosphere and the lakes. The amount of gas dissolved in the water is in turn influenced by the amount of phytoplankton particularly algae which consume carbon dioxide during photosynthesis in turn sinking the carbon into the lakes.

**Keywords: Algae, Carbon sequestration, Lake, Phytoplankton**

## 12. ECONOMICS

### 0512166 AASTHA (A. N. Sinha Institute of Social Studies, Gandhi Maidan, Patna). WOMEN EMPOWERMENT AND UNPAID WORK DILEMMA

This paper deals with the problem of unpaid women workers and their general education level. Hence, this paper discusses the trend and patterns of unpaid female domestic workers and their general education level. Further, in this paper, the investigator has tried to seek answer of question that 'Does level of education matter for unpaid women works? This study is based on secondary data analysis and extensive literature review. In order to solve the research problems, study uses NSSO data. Findings of this study show, that, in rural areas, the intensity and drudgery of these works are high in comparison to urban areas. It is observed that girls have freedom to pursue their study, but, along with their studies they are also bound to perform some kind of domestic duties. The burden and drudgery of domestic works are the highest among unmarried school and college going girls. The volume of unpaid women domestic workers has increased over time and girl - child workers are also engaged in unpaid domestic duties which are also a serious issue of concern. Studies asserts that in India, state has initiated some major schemes with objectives to eliminate the practices of child labour, to protect the rights of workers as well as to achieve the goal of gender equality. But, policies failures are clearly visible in context of unpaid domestic workers. Besides, increasing volume of unpaid domestic workers, policy - makers and academicians have overlooked the problem of

unpaid women domestic workers. Another, result shows that, the participation of females workers in unpaid domestic duties have not declined with increase in their general education level. Literature suggests that factors like patriarchy, market forces, policies negligence are responsible for existence of unpaid workers.

**Key words: Unpaid Work, Education, NSSO**

**0512167 ABDULLAH, MOHD (Department of Economics, Baba Saheb Bhimrao Ambedkar University, Lucknow). HISTORICAL BACKGROUND OF GUJJAR COMMUNITY IN JAMMU AND KASHMIR: A CASE STUDY**

Article 342 of Indian constitution provides specification to tribal communities and tribes. Presently scheduled tribe's population are living in thirty Indian states and union territories and they are divided into 705 individual ethnic group. Jammu and Kashmir hold 2<sup>nd</sup> rank in schedule tribe's population after Madhya Pradesh with 11.9% and 14.7% respectively. According to (census 2011). Jammu and Kashmir have 14.9 lakh schedule tribe population and is sub- divided in twelve tribes (community). Gujjars is one among them the 3<sup>rd</sup> largest community of Jammu and Kashmir after Kashmiri and Ladakhi community. Gujjars community constitute 69.1% population of schedule tribe of Jammu and Kashmir and 8.1% of total population of Jammu and Kashmir (census 2011). The main objective of the paper is to know about origin and historical background of Gujjars. Gujjars community initially found in Gurjistan (Georgia) but latter on they started migration towards east Iran, Afghanistan and crossed Sulaiman passes and finally entered in Indus valley, with the passage of time again they started migration towards south and came to Gujarat and spread in Kathiawar, Uttar Pradesh, Rajasthan, Punjab, Haryana and Jammu and Kashmir. The word 'Gujjar' is derived from two Sanskrit words 'Gur' means enemy and 'jar' means destroyer which means 'destroyer of the enemy' (Sanskrit dictionary shakabada p.1181). This paper is based on secondary data source and theoretical in nature.

**Key Words: Tribes, Schedule Tribe, Ethnic Group, Gujjars, Migration, Jammu And Kashmir.**

**0512168 CHAKRABARTI, SAUMYA (Department of Economics, Visva-Bharati University, Santiniketan). A DARK SIDE OF GLOBALIZATION : THE FORMAL-INFORMAL CONFLICT**

The idea of development is now being integrated with the vision of globalization. It is argued that with appropriate institutional makeovers and optimal monitoring globalization could very well be all-inclusive and thereby could usher in comprehensive development for the laggard countries. In this context, we look at the informal sector - a major site of socio-economic exclusion, placing it within an open economy macroeconomic framework built for a developing country, and ask, whether this Informal sector too, along with other sectors, benefit due to the globalization of the Global South. We construct this macro-model along Kaleckian structuralist lines; however, extending it by incorporating a dichotomized agriculture and a trichotomized Informal sector. In the mainstream literature, the informal sector is often posited as a 'junior partner' of the formal sector and there is predominantly a (two-way) complementary relationship between the two. Further, it is opined that appropriately monitored globalization is beneficial for both.

However, we, on the contrary, show that, while globalization could be beneficial for the modern formal sector, for the modernising export-capable-crop producing segment of agriculture and even for that part of the Informal sector which is linked with the formal sector via input-output and market relations, a much larger part of the informality is adversely affected. Even if there is no immediate resource as also market/demand sharing by the formal and informal sectors, we show, deeper integration of the formal sector and agriculture of the developing countries with the global market may generate a variety of effects across the different segments of the Informal sector -- while some could benefit, many suffer. A large part of the informal sector suffocates and the workers are impoverished to become the 'neo-nomads' of the 21st century. We take up some theoretical exercises to show such conflicts between the modern and traditional and undertake a detailed empirical analysis using Indian data to verify these theoretical conjectures; and finally, take on some probable policy measures.

**Keywords: global market, commodity trade, global capital, crop diversification, contract farming, formal-informal complementarity and conflict, resource constraint, foreign exchange constraint.**

**0512169 CHOUDHARY, ANAMIKA (Department of Economics, DSMNR University, Lucknow). AN ASSESSMENT OF SUSTAINABILITY OF GROWTH THROUGH TFP (TOTAL FACTOR PRODUCTIVITY) IN THE POST REFORM SCENARIO IN INDIA**

In early 1991, India underwent a major macroeconomic crisis accompanied with the balance of payments crisis which stood like a big hurdle in paving the path of economic growth for the economy. The new government had to introduce new economic reforms in 1991, a condition given by the IMF and World Bank in giving its assistance. But the post reform era do not conclude whether economic growth has become more volatile. Stability and sustainability cannot signify the same notion. To stabilize growth is very much different from sustaining growth. Maintaining a trend rate of growth is in fact different from keeping low the volatility of growth around its non negative trend. Stability may even occur at a stagnant or low growth rate but that does not participate in achieving the targets of eradicating poverty for once and all. The policies that help to stabilize growth may well differ from the policies that help to sustain growth. Some policies may yield slow but less volatile growth but there may be policies which may yield faster growth but be more volatile. In a very comprehensive way, sustainable development marks a *"new attitude towards the environment, changing the relationship between human and nature, in order to establish a new partnership between the two entities, balance and harmony between them"*.

For growth to be meaningful, it has to be sustainable. This has both internal and external aspects. Internally we need to manage our public finances so as to curb large fiscal deficits because a high fiscal deficit increases borrowing from RBI and leads to a higher level of monetary expansion than what the GDP growth can sustain with inevitable consequence of pressure on prices. It is thus an innovational type of economic growth which may provide sustainability of economic development. It is sustainability that reminds of the fast growing up of Soviet Union which led to a fear that the Soviet Union might overtake the US economically as well as militarily and thus a research on sustainability of growth becomes a priority area. It also brought into focus the *contribution of Total Factor Productivity (TFP)* to growth in growth accounts. From the perspective of growth sustainability, growth is sustainable in the long run only if the major contributor to it is TFP growth, driven by technical progress. For this reason, estimating the contribution of TFP growth to remain as the significant growth to aggregate as well as sectoral growth empirically has attracted research activity. The present paper highlights the contribution of TFP in maintaining the sustainability of growth in the Indian economy in the post economic scenario. The pertinent question that arises is whether TFP growth has been a significant contributor of India's growth since Independence. The question extends as to whether in the post reform period its contribution has become larger. Positive result will surely mark that the growth has not only accelerated but has also become sustainable in the post reform period.

**Keywords: stability, sustainability, total factor productivity, growth, post reform**

**0512170 DAS, SANGITA (Jadavpur University, Kolkata, West Bengal). EVALUATING AN IMPACT OF EMPLOYMENT DIVERSIFICATION ON POVERTY OF THE AGRICULTURAL LABOURERS IN WEST BENGAL**

In West Bengal, a large segment of people are heavily reliant on agriculture, especially, in terms of agricultural labourers where 31.04 percent of males and 38.56 percent of females to the total rural workforce during the 2000s [Statistical Handbook, Govt. of WB (2006)]. To overcome the economic instability of the farming sector and rising level poverty, agricultural labourers look for additional sources of income towards the on-farm, non-farm, and market-oriented activities. In this context, our study will initially try to examine the nature of employment diversification among the agricultural labourers and assess whether employment diversification helps them to improve their living standards by reducing the poverty level in West Bengal. A primary survey has been conducted in Bhagawanpur Block-1 in the district of East Midnapur of West Bengal. We have purposively chosen the block as a considerable number of people among the total workforce are agricultural labourers (48.98 percent) and the incidence of Poverty is shown 27.81 based on the Human Poverty Index of Census, 2011. In this field investigation,

we randomly selected nine villages from the Block. From these nine villages, we again randomly selected 405 sample households of agricultural labourers where 285 labourers are marginal, and 120 labourers are landless. We have then tried to estimate the poverty level among the agricultural labourers in West Bengal by calculating monthly per capita consumption expenditure based on the adult equivalent approach. For calculating the poverty line, we have taken four major items - Food items, intoxicants, Fuel & Electricity (or light) and Miscellaneous adjusted with their weights and current prices for agricultural labourers and converted to the monthly consumption expenditure (MCE) of the household. This value of MPCE can be compared with the poverty line of the Tendulkar Committee (2011-12) Rs 1127.52 and determined how many numbers of sample households are falling into below the poverty line. The paper will then try to examine the possible factors which can reduce the poverty level among the agricultural labourers in our study area. Paper initially computes the Simpson Index (S.I) and Berry's index (B.I) for measuring livelihood diversification, which are major determinants for reducing poverty. Another important factor, the dependency ratio (depratio) which indicates that the respondent's ability to maintain the livelihood of other family members. We observe the wide expansion of the micro-finance program in rural areas where most of the participants are local rural women. This micro-finance program through forming the Self-Help group (shg) under joint liability credit contract enhances the empowerment of women and they become an earning member of the family. Besides these factors, Educational attainment of household head or respondent (edu), total number of days of unemployment by respondent during the reference year (unempdays), total operated land (in decimal) in form of both possessed and leased-in land (operland), total number of family labourers involved in agriculture (familylabor) and dependency of informal loan (informalloan) are considered to be the crucial factors to impact poverty level among the agricultural labourers in West Bengal.

As in our study, initially, the Durbin-Wu-Hausman test for endogeneity reflects two binary regressors – S.I and B.I are endogenous, we should identify an ideal instrumental variable(s) that affects outcomes (poverty level) only through its influence on the binary regressor. So, the Instrumental variable method is applied in our Probit regression analysis. The age of household head (age) and Adult Equivalent Ratio (aer) are used as instrumental variables of diversification. The result shows that higher value of S.I and B.I, more probability of being APL category household. The probability of being APL households inversely correlated to the dependency ratio, as higher dependent persons of household head lowers the ability level to meet the needs of households. Higher operative land is expected to meet food consumption as well as earn some lumpsum amount of income from agriculture which may help to reduce the poverty level. Engagement of more supply of family labor in agricultural activities is expected to reduce the hire labour cost. On the contrary, in our study, education, unemployment days and self-help group do not have any significant impact on the poverty level among the agricultural labourers in West Bengal.

In a nutshell, our study shows that it is needed to create more farm as well as non-farm diversified activities and self-employment jobs. It is also needed for more innovation for formal financial institutions and social awareness for the reduction of poverty level among the agricultural labourers in rural West Bengal. The results of the study towards the relationship between livelihood diversification and poverty level among the agricultural labourers are expected to be useful in further research and help the policymaker to implement new policies for reducing the poverty level.

**Key words:** Agricultural labour market, Diversification index, Probit regression, Instrumental Variable Analysis

**0512171 DEVI, KANTI (.....). AGEING AND ECONOMIC DEVELOPMENT: A THEORETICAL STUDY**

Health is indubitably the most vital of all human assets and everyone has the right to access and avail of best health facilities. The millennial era has seen an increase in life expectancy. This is, indeed, a welcome scenario as the nation and society can benefit from the experience of the senior citizens. At the same time, the increase in the ageing population has necessitated more demand for better health care. Aged persons are the most vulnerable section of the society and are beset with several problems in their advanced years. They are physically weak, they are economically dependent on others and they need more health accessibility. This theoretical study focuses on the

relationship between ageing and health and analyses how ageing influences the health care demand. Further, the study also explores the link between ageing and economic development. Good health promotes longevity due to lower mortality and longevity promotes economic development. When people live longer while being healthy, they can contribute more significantly in economy.

**Key-words: Ageing, Health, Economic development.**

**0512172 Gaur Monika and Kant, Ravi (Faculty of Management Studies, University of Delhi, New Delhi-11007). EXAMINING THE IMPACT OF FACTORS INFLUENCING HIGH TECH EXPORTS**

The high technology exports are one indicator that can access the outcome of Research and development of the economy. This study employed the data of High tech exports of 15 developed and developing economies from the period 2007 to 2018. The regression analysis with the explanatory variables such as R&D investment as a percentage of GDP, Gross Capital formation, unemployment rate, FDI inflow and Governmental expenditure on education has been employed. The World Bank database is the source of data and statistics. Two major findings that study implicated. First, the benefits of an outward oriented policy that has resulted in promotion of high-tech exports, Secondly, the government expenditure on education is not pro-research and has ramifications on high tech exports. The present study is entailing that government expenditure should be slenderly used and must address the research pursuit.

**Keywords: Research and development, developed economies, investment, development, growth.**

**0512173 GUHA, DEBASISH (Department of Economics, University of Allahabad, Prayagraj-211002). SUSTAINING MARINE LIFE FOR SUSTAINING HUMAN LIFE: ENVIRONMENTAL GOVERNANCE IS THE KEY**

Oceans, seas and marine resources provides humankind with numerous goods and ecosystem services fundamental to human survival and well-being. They form an integrated and essential components of our planet's ecosystem and are critical to sustainable development. Ocean covers more than 70 percent of the surface of our planet. About 40 percent of people depend on marine and coastal diversity for their livelihoods contributing about 5 percent of global GDP. They absorb about 30 percent of carbon dioxide produced by humans. The Goal 14 of the SDGs states, "Conserve and sustainably use the oceans, seas and marine resources for sustainable development".

Marine life, ocean health, estuaries and coastal zones are under tremendous environmental threats and critical pressure. Oceans are being polluted with various types of pollutants including heavy metals, oil, polychlorinated biphenyls, solid wastes and plastics. The sources of pollutions include land based discharges, dumping, maritime transport, ship manufacturing and scuttling, agricultural runoffs, radioactive substances and atmospheric pollution. A number of estuarine and marine pollution hotspots have emerged across the world. The marine pollution Effects ecosystem, health, public health, recreational water quality and economic viability in different ways like mechanical, eutrophication, saphrogenic, toxicity, mutagenic and carcinogenic. A well designed multi-dimensional governance strategy covering both corrective and preventive measures, is urgently required for countering these threats timely and effectively.

The SDG Goal 14 covers the targets relating to marine pollution, acidification, over fishing, over exploitation of resources, conservation, sustainable use, scientific knowledge, international law, strengthening the resilience of marine life etc.

To achieve the twin goals – a sustainable marine life below water and sustainable human life above water – requires a multi-dimensional approach, of which governance is the key. It covers a number of focus areas related to marine viz. governance, law, manufacturing, transportation, offshore oil and gas exploration, aquaculture, tourism, harbor development, estuarine management, green port planning, Blue Flag initiative etc. The ultimate goal is to achieve oceans which are free from pollution. The present paper focuses on the critical conditions of marine life and outlines a governance strategy in this regard.

**Keywords: SDG 14, Environmental Governance, Marine Pollution, Estuaries**

**0512174 GUPTA, PAWAN KUMAR AND DAS DEEPANJALI (Department of Economics, Babasaheb Bhim Rao Ambedkar University, Lucknow). AS STUDY OF POLICY SHIFT TOWARDS FDI IN INDIA**

The purpose of this study is to review India's foreign direct investment policy direct. This time frame becomes even more significant in the Indian economy as the FDI policy was liberalized and witnessed numerous revisions during 1991-2018. Evidence for this empirical analysis has been collected from the RBI, DIPP, FIPB, various research papers and websites. Tables and charts have been used for descriptive analysis. This study's found that with the foreign direct investment policy being liberalized, the flow of FDI into the economy has also increased. Hence, the conclusion of the current study underlines that FDI in the economy will increase if the policy is more liberal. Furthermore, the study also cites that factors such as global financial conditions and the decisions taken by the government of the host country also affect FDIs. Thus, to attract investment from abroad, it is expected that the government will continue the liberalization of FDI regime in India in the coming months.

**Keywords: FDI, RBI, DIPP, FIPB and Economy.**

**0512175 GUPTA, NIMISH (Amity Business School, Lucknow). MIDDLE CLASS POPULATION IN INDIA AND ITS IMPACT ON THE EMERGING INDIAN ECONOMY**

The improvement in living standards and way of spending money of the Indian middle class in recent years symbolizes its dominant presence in the economy. To foreign investors and government officials, the middle class is a potential market and a testimony to the country's economic progress. Whereas in the 1960s and 1970s India's image was synonymous with poverty, in the 1980s and 1990s international attention has increasingly focused on the process of economic liberalization and globalization. The burgeoning middle class, which gained a new lease of life under a liberalized economic environment (post-1985), has emerged as a selling point for the country in international forums. Subsequent to India's further economic liberalization in July 1991, a report in Fortune magazine announced that the country's attempt to enter the global economy offered ample 'opportunities', especially 'the chance to sell to India's huge middle class' whose expansion, it claimed, was more rapid than that of other sections of the population. Similarly, at a business forum in Melbourne, India's Minister of State for External Affairs strongly promoted India as an alternative to China by highlighting his country's strengths, including an estimated middle class of over 250 million people. The transitional phase of a country from being not developed and developing rapidly has been coined as emerging markets. Such countries are experiencing a transition from a closed economy to a free market-oriented business environment with increasing economic growth, GDP, expanding and emerging middle class, improving living standards and quality of life and increasing international cooperation. According to the World Bank, the four largest emerging economies are BRICs (Brazil, Russia, India and China). The emerging markets are working strategically in a way that they have outpaced the developed markets and are developing as global powerhouses. In this paper, rise of middle class would be analyzed as the major driver that has led to the stunning growth of the emerging markets economies during the last decade.

Despite the rising consumption, there has been an increasing trend in saving rates and urbanization in India. The rise in middle class is an important key driver for the growth of emerging markets such as India. An effective combination of young and educated working age middle class with high disposable income and investment opportunities has accelerated the growth of individual investors in India. In India, with new financial reforms, there has been a rise in investor confidence that has attracted strong capital flows. The economic growth in the last few years has experienced a growth in participation of individual investors. Rising GDP and stock market performance has influenced Indian investors to see an opportunity to create wealth.

**Key words: middle class, emerging markets, economic growth, shifting wealth**



**0512176 HASSAN, SAMIR UL AND MISHRA, BISWAMBHAR (Department of Economics, University of Science & Technology Meghalaya). INSTITUTIONAL ARRANGEMENTS AND FISCAL SUSTAINABILITY OF DEMOCRATIC COUNTRIES: A STUDY OF INDIA AT NATIONAL AND SUB-NATIONAL LEVEL**

The paper investigates the nexused between the budget and political institutions on the fiscal sustainability rules in India at both national and sub national level. The main aim is to understand whether the institutional arrangements has any bearing upon the fiscal performance in democratic countries such as India. Our approach considers two measures of fiscal sustainability rules such as fiscal deficits and financial debt and budgetary process and political system as institutional arrangements. The study uses cross-section regression model to assess the impact of budget and electoral institutions on fiscal sustainability. The study found that tight federal budgetary process defuse the fiscal deficit and financial debt at national level but lead to serious impact at sub national levels. Further, the study found that the political arrangements in terms of more representatives (MPs and MLAs) selected from one district and larger political fragmentation, tend to have controlled fiscal deficits but more debt at national level and large fiscal deficit and debt at sub-national level. The study also found that the power and influence of finance minister and strength of cabinet ministers lead to lower deficits and debt.

**Key Words: Budget, Institutions, Fiscal Deficit, Debt, Fiscal Sustainability**

**0512177 JHA, PRITI (Department of Economics, Babasaheb Bhim RaoAmbedkar University, Lucknow). PARTICIPATORY IRRIGATION MANAGEMENT AND ECONOMIC DEVELOPMENT: A THEORETICAL AND CONCEPTUAL PERSPECTIVE AND APPROACHES**

Water resource management is an emerging problem for Government, policymakers and Users (people) too. To manage it, the concept of Participatory Irrigation Management has emerged in many countries from last four decades. This paper argues about the various types of theories depicting the significance of participation in development. This theoretical framework is divided into two sections; first section deals with before 1960's time period with some classical theories as A. Marshall, Russeau and Mill etc. while second section describes about the theories of Hardin, Olsan, Arnstien, Ostram and others too. The main difference in both theories was noticed as the first group did not talk about participation management towards natural resource management. The objective of this paper is to discuss about the development of theoretical as well as conceptual base of participation for management between authorities and users. This paper is divided into three sections: first part discuss about the theoretical background of Participatory management, while second part, conceptual framework of Participation Irrigation Management and Water User Association has been developed, and in last section the significance of Participatory Approach and Economic Development in Indian context has been discussed.

**Keywords: Water Management, Theories and concept, Economic Development, PIM**

**0512178 JOSHI, R PRIYANKA (Economics, MWAC&MC). 1209 INDUSTRIAL ECONOMICS**

An industry is an organisation involved in the manufacture or in the production of an intermediate good or a finished good. It provides employment to lots of skilled and unskilled labourers by providing training. An Industry is a sector that produces goods or related services within an economy. In this paper we will be discussing about the role of Industrialization, its contribution, how it is important and also the pattern of Industrialization in Indian context. Pattern of Industrial Location and the Location Theory of Weber.

**Keywords: Industrialisation, contribution of industrialisation ,factors influencing location, weber theory of location.**

**0512179 KAUSHIK, SHIVANGI (Oxford Department of International Development, University of Oxford). THE RISE OF A RACIALIZED RENT ECONOMY IN NEW DELHI: UNDERSTANDING**

### **MIGRANT STUDENTS' RESISTANCE TO THE STRUCTURAL VIOLENCE OF RENT EXPLOITATION IN A DELHI NEIGHBOURHOOD**

This paper seeks to understand the socio-economic transformation of an erstwhile urban village: Old Gupta Colony near Delhi University to a bustling rent economy for accommodating students from different parts of the country. In trying to understand this transformation, the study seeks to explore the ways in which migrant students with different racial and linguistic backgrounds negotiate and resist 'rent exploitation' by forming regional and state-based networks and student associations (like Northeast Students Association- Delhi University or All Kargil Students Association- Delhi) to provide each other 'information' of cheap and vacant available accommodation, to avoid the interference of middlemen or brokers. The increasing rent seeking behaviour of the landlords is interpreted here as structural violence as it tends to seriously disadvantage the students who are not able to gain admission in the hostels provided by the colleges and also who do not have the required economic capital to seek accommodation in the expensive private guest accommodation (PGs) here. Further, these students are also not organized in the form of coherent unions in comparison to the advantaged landed local elites who can increase rent and rely on community networks to search for 'suitable tenants'. Being landed and having the capacity to determine rent then becomes the most important criterion for a person to 'belong' in Delhi vis a vis the disadvantaged and racialized migrant students.

This paper then seeks to understand how property relations (both ownership and tenancy) can shape the experience of migrant students from different parts of the country in Delhi. In doing this, the paper seeks to understand how race, gender and class intersect to constitute the desirable tenant who have to juggle academics as well as racialization at almost the same time. The paper then argues, that it is through land and rented property that the local *Delhiites* can consolidate community networks to negotiate rent agreements and find tenants. The study looks at the varied experiences of students from Northeast India, Ladakh and Kashmir (excluding Jammu) of finding accommodation outside of college hostels and balancing the dual responsibility of fighting racialized stereotypes of being *chinkies*, terrorists or anti-nationals and the being the perfect tenant: eating the right cuisine (vegetarian), dressing the appropriate way, paying rent on time and also being mindful about their timings and the kind of company they invite.

Increasing rent seems to have preoccupied the minds of students as these PGs owing to their fluctuating rent become more of a temporary refuge than a permanent solution. It is argue that is a form of structural violence as students are often forced to look for new sources of accommodation without staying the entire lease period at the cost of losing their security deposit or cooking for themselves and forcing themselves to share accommodation in very tiny apartments. Thus there is a very tacit intersection of race, rent and language barriers which severely disadvantages them in comparison to their well-connected landlords and brokers. This also affects the amount of time and energy that the students can actually devote to their academics and their other activities. The paper seeks to understand if the state (the Delhi government and urban planners) in this case is absent especially in ensuring that migrant students can gain access to college education in Delhi, without having to 'worry' about increasing rents and being the desirable tenant. Thus, it will make an important contribution to understanding how structural violence (of which rent based exploitation is an important factor) impinges upon the everyday lives of migrant students who try to make a space for themselves in the cities by creating their networks or associations within their own communities to negotiate with their landlords while recasting themselves as desirable tenants who can belong to the city.

### **0512180 KOUSER, ASMA (Department of Economics, Bengaluru Central University, Bengaluru). EXPLORING THE STRUCTURAL TRANSFORMATION TOWARDS INNOVATION ECONOMY: A CASE OF INDIA AND RUSSIA**

Innovation is a composite metrics to understand the structure of economic growth and operations. The 'Economic-Darwinism' have survived the vagaries of historical uncertainties. And now the term innovation is one of an essential tool in various national, industrial and science & technology policies across the globe. Looking at the case of India and Russia, both the countries have a unique trajectory of economic development. The Russian's from the time of Soviet Era have focused on various aspects of innovation indicators in their policy structure. Although, the transformation has not been without challenges right from the time of Soviet disintegration. The pathways which

Russia took towards its innovation strategies and policies; with role of state and other agencies, requires deeper investigation. The case of India is also unique with structural similarities from Russian economic trajectory. It is important to investigate how the India of 1950s with ideas of socialism, self-reliance and strong public sector, transformed to a liberalised economy? And further in the recent times it has again tried to strengthen the roots of self-reliance through programmes and instruments like Make in India, Skill India, Startup India etc.

The paper will state the innovation economy template specific to both India and Russia. Further, analytically review and compare that how the structural transformation happened towards innovation economy in these two nations. Since, the scale of economic activities and compositions of both these countries is very different. This work will also explore and identify key areas for future collaborations between India-Russia in the innovation space.

Methodology, the sources for analysis will be expert interview, research papers, analytical reports by main international organisations and nationalise key players. While using the database of Annual Innovation Survey of Higher School of Economics (HSE), Russian government sources (ROSSTAT). Where the review study will consider innovation variables with indicators (input and output) linked to the innovation strategy of both the countries. The Systems of Innovation (SI), a theoretical framework is used as a template to make analysis much easier for two different countries.

The study will be further significant in understanding the strong contours of Indo-Russian friendship in the areas of science and technology (S&T) collaborations which can be utilized for mutual benefit which in return will consolidate the innovations systems by creating more linkages. In the light of the above, at this point, it is the growth of ideas and innovation which remains critical for successful transition towards knowledge-based economy and make sustained progress. Thus the choice that Russia and India makes, shall determine its economic development, transformation process in the coming decades and its innovation policy.

**Keywords : System of Innovation, Soviet legacy, Science & Technology, Innovation Indicators, National Innovation Systems, Innovation.**

**0512181 KUMAR, DINESH (Department of Economics, Ch. Charan Singh University, Meerut). AN EVALUATION OF BANKING ECONOMIC EFFICIENCY USING DEA APPROACH**

The banking sector of any economy plays a crucial role in channelizing savings from surplus fund to deficit. The performance of any economy to a large extent is dependent on the performance of the banking sector as it being the predominant condition of the financial service industry. The changing economic conditions have challenged many organizations to search for more efficient and effective ways to manage their business operations. This paper mainly concerns to Indian banking sector and that's why in this work DMUs are of two type of banking institutions one is public sector bank and the second is private sector banks. The Indian government and the RBI are taking measures such as capital injection, increased provisioning requirements, bank consolidation, etc. However, these measures will only be effective if they are being targeted. In order to make these measures effective, it is also necessary to conduct an analysis of the efficiency of the sub-sectors of the banking sector and to highlight certain inefficiencies. In the light of such a situation, measuring the technical efficiency of individual decision-making units (banks) using best-practice technology (assumed for all banks in the sector) may not give a true picture of the situation. Therefore, the main objective of this paper is to analyze intra-industry efficiencies based on ownership structures in the Indian banking sector.

The term economic efficiency constitutes both the Technical efficiency and Allocative efficiency of individual firms. A firm is called Technical efficient if it is able to obtain maximum output from a given set of inputs(output oriented) or is capable of using a minimal input mix to produce the same level of outputs(input oriented measures) A firm is allocative efficient if it employs factors of production up to the point where the marginal rate of substitution between any two of its inputs equals the ratio of corresponding input prices. The most widely used non-parametric approach is Data Envelopment Analysis (DEA), while the Stochastic Border Approach

(SFA) and the Non-Distributed Approach (DFA) are the parametric approaches most frequently used (**Kosak&Zajc, 2006**).

Previous studies on bank efficiency focused on the study of financial ratios and the analysis of economies of scale and scope. The closer efficiency value to 1, it means the closer between what is happening in production system now compared to ideal situation relative to the surface. However, the researchers later noticed that there were aspects of efficiency such as Technical efficiency and Allocative efficiency (**Molyneux, Altunbas& Gardener1996**) that to be taken into account when studying efficiency. These two factors were introduced by **Farell (1957) and Leibenstein (1966)** with the concept of efficiency X which encompasses both of these measures. While the benefit of X efficiency over economies of scale and scope has long been known, researchers have only been interested in X effectiveness for just fifteen years. Measurement of X efficiency involves constructing the efficiency frontier.

**0512182 KUMAR, SHANU (Mahatma Gandhi Central University, Motihari, Bihar). EXCHANGE RATE DETERMINATION: SOME RECENT THEORETICAL DEVELOPMENTS**

In the literature various theoretical models are given to analyse exchange rate determination and its behaviour. Theories of exchange rate determination have seen a significant change since the exchange rate system shifted from fixed rate system to the floating exchange-rate system. The modern exchange rate theories are built on the basis of monetary approach and the asset market or portfolio balance approach to the balance of payments which have been developed since late 1960s. These theories consider exchange rate, for the most part, as a purely financial phenomenon. The traditional exchange rate theories are based on trade flows and help explain exchange rate movements only in the long run. But, since the advent of floating exchange rates in 1973, international financial flows have increased tremendously which are far larger than trade flows. Therefore, now the interest has shifted towards monetary theory of exchange rate determination. However, the traditional theories are still relevant in explaining exchange rate in the long run. This paper deals with all the important theoretical developments happened in the past related to exchange rate determination.

**Keywords: Exchange Rate, Asset Approach, Portfolio Balance Approach**

**0512183 MISHRA, BISWAMBHARA AND HASSAN, SAMIR-UL (Department of Economics, North-Eastern Hill University, Shillong). CHANGING PARADIGM OF ECONOMIC THEORIES AND CURRENT TRENDS IN ECONOMICS RESEARCH**

The paper is a theoretical exercise to understand the current trends in economic theory and research. The objective of this exercise is to explore the nature, rationality and relevance of the economic theories which has been put forward over the decades and to explore whether the changing paradigm of economic research and theories are in line with the contemporary economic realities that the economy experiences? Reviewing the works done over last few decades, we observe that researchers in economics have gone beyond the traditional set of Economic theorization in terms of the well perceived economic assumptions of rationality, consistency of individual choices with expected utility theory and free flow of information that updates the opinions and beliefs of the people at large. But, the emergence of new theories and experiments such as moral hazard based on asymmetric information, cognitive biases and working of the markets in real situations have motivated the researchers over the years to undertake various studies of human behaviour in a controlled laboratory settings rather than understanding and accepting the contemporary economic problems in a usual framework of mathematical gimmicks. We observed that the current research and theories are holistic in nature, rational in its thoughts and scientific in application. No doubt, the contemporary theories in economics have made tremendous efforts to cover a broader framework of human behaviour, the aspect of rationality, provide solution for chronic economic problem and highlights the future trajectory of economy. This has necessitated the contemporary economists to carry out their researches in the line of experimental methods and as such the experimental economics has become instrumental understanding the economic theories in a more practical and realistic settings. The paper concludes that the contemporary economic

researches has been able to keep a balance between societal welfare and economic development by bringing to the focal point the economic behaviour and the way it interacts with the economic institutions on the grounded realities.

**Key Words: Behavioural Theory, Asymmetric Information, Environment sustainability, Democracy.**

**0512184 PADHY, MAHENDRA KUMAR (Department of Mass Communication and Journalism Babasaheb Bhimrao Ambedkar Central University, Lucknow). POVERTY ALLEVIATION, FOOD SECURITY AND ENVIRONMENTAL PROTECTION: COMMUNICATING SUSTAINABLE DEVELOPMENT BEHAVIOUR THROUGH COMMUNITY MEDIA**

“Think globally and act locally” is the most important persuasive slogan. A sincere effort has been made to identify and delineate the role of community media in general and specific roles of various communication channels in meeting the goals of sustainable development in particular. In case of specificity, the manner in which community media plays its role for sustainable development is discussed in detail. Sustainable development is an integrated and holistic approach that calls for the participation of individuals, groups, organizations (particularly the NGO’s), public and governments at local, regional, national and global levels. The goal of sustainable development is not confined to one locality or region or nation but embraces the entire globe. It extends not for a few years, but for the distant future too. Thus, spatially or temporally its scope is very wide. It requires people to think globally and act locally for the development and growth. Informed and conscious citizens can utilize poverty alleviation programmes effectively and successfully. Informed and aware citizens can also play a responsible role in promoting environmental protection in various walks of their lives.. In fact to fulfill the goals of sustainable development there is an indispensable need to mould a lifestyle that is environment friendly and equitable all over the world.

**Keywords: Community Media Sustainable Development, Poverty Alleviation, Intra generational and inter-generational equity.**

**0512185 PODDAR, SAYANTI (Department of Geography, Asutosh College, University of Calcutta). ROLE OF COOPERATIVES IN THE SUSTENANCE AND DEVELOPMENT OF THE HANDLOOM INDUSTRY OF NADIA DISTRICT IN WEST BENGAL**

In the present economic scenario of India, when the dependency on foreign capital and technological knowhow is always increasing, the handloom industry, comprising both of cottage and small-scale industries, offers a sustainable model with low energy consumption, moderate to low capital costs and extensive skill base. The handloom products, as an important component of the export basket of the country, have been contributing substantially to the export earnings even in this era of global competitiveness. Handloom weaving has a long tradition of excellence and craftsmanship. The industry nowadays is, however, trying to adapt itself to modern trends, changes in fashion, recent economic turmoil and keen competition from the powerloom sector. Nadia district of West Bengal occupies an important place in the field of handloom industry of the state as well as that of the country. Although the agricultural sector acts as the backbone of the district’s economy, handloom industry also plays an important role in this regard. It contributes significantly in favour of employment generation by providing direct and indirect employment to about two lakh people of the district. The handloom industrial cooperative societies of Nadia district play a vital role in the functioning and sustenance of the industry. Though the societies became operational in the mid 1970’s, they have recently come into focus and gained tremendous importance in the handloom industrial sector in a very short period of time. In fact, in this era of economic conundrum, which has led to the disappearance of handloom activities in local pockets of the district, these cooperatives acted as prime supports in selected areas of Nadia. The study thus attempts to unfold the role of the cooperatives in the sustenance and development of the handloom industry of Nadia district.

**Key words: handloom, cooperative, economic development, financial assistance, welfare.**

**0512186 PRATINIDHI AND VERMA, NMP (Department of Economics, Babasaheb Bhimrao Ambedkar University, Lucknow). THEORETICAL RELATIONSHIP BETWEEN INFLATION AND UNEMPLOYMENT: A MACRO-ECONOMIC STUDY**

Inflation and unemployment are the key reflectors of fluctuations in an economy. The relationship between inflation and unemployment has been a subject of contention among economists and is frequently used in macroeconomics. The Phillips Curve Theory makes this relationship even more evident. In fact the Phillips Curve is the most pertinent tool for policy makers for crafting economic policies. Phillips Curve theory is particularly relevant in the context of the decisions that the central bank of a country takes. Many financial publications talk about central banks' attempts to boost or slow the pace of economic activity. In other words, central bank's policies are often determined by gauging the expansions and contractions of money in the economy according to the Phillips curve's shape. Phillips curve theory establishes the relationship between the rate of inflation and the rate of unemployment. The theory cites an inverse relationship between the rate of inflation and the rate of unemployment. This study, in particular, explores all the theoretical descriptions or details about the Phillips Curve approach. Further, the study's intent is also to examine the Phillips Curve's shape by the Polynomial Regression Model and graphical presentation from 1991 to 2015. For a more exhaustive analysis, the study's empirical data also alludes to the recent economic slowdown from 2018 Jan to 2019 October in the Indian context.

**Keywords: Descriptive, Inflation, Unemployment, Phillips Curve, Polynomial Regression Model.**

**0512187 RASTOGI, HIMANSHU (Department of Business Administration, Amity Business School, Amity University, Lucknow). INDIA'S ROAD TO ECONOMIC GROWTH – OPPORTUNITIES AND CHALLENGES**

India has been marching fast on the path of economic development as has been the torch bearer to world over in terms of not only achieving impressive growth but also in terms of tackling smartly many hurdles which were coming across her growth story. India which was at tenth position in terms of GDP of USD 2.1 trillion in the year 2014-15 is now the world's seventh-largest economy (World Bank figures for 2018) with GDP amounting to 2.72 trillion USD at the end of last year, though we slipped from sixth position achieved in 2017 because of some sluggishness in India's growth story. Similarly, we have improved our rank significantly in terms of ease of doing business to climb up 23 ranks to be at 77<sup>th</sup> position as per World Bank's Doing Business Report 2018 becoming the top ranked country in South Asia for the first time and third among the BRICS. In the last two years the country has climbed 53 notches, a performance matched in the past only by Bhutan. Apart from this India is ranked 7th in terms of area (CIA World Factbook 2013), 2nd in terms of population, having the advantage of being one of the youngest nations having 65 percentage of population below the age of 35 year. India is also among the fastest growing economies and is expected to become third economic power (China, US and India) by 2030(IMF Standard Chartered Research 2011, World Economic Forum Report 2019). In addition to it the country is also recognized as an important constituent of BRICS nations upon which the future growth story of the world lies. However, voices of slowdown of Indian economy are gaining momentum ever since the country witnessed slowest quarterly growth of 5 percent for quarter June 2019, raising questions over its sustainability in future. Even in this period the expectations are that Indian economy will be the world's second largest growing economy at 6 percent behind only to China with 6.1 percent for year 2019 as per Trade and Development Report 2019 released by UNCTAD which states that economic sluggishness is world over and world growth rate falling from 3 percent in 2018 to projected 2.3 percent for 2019. The more challenges posed to India are related to low per capita income, high population pressure, low literacy rate, high unemployment rate, poor basic infrastructure to mention a few that have to be taken care of to convert the predictions into reality. The paper tries to focus on the opportunities to bank upon and challenges that the country has to face, if not readily taken care of will result in converting the entire success story into an unachieved opportunity. The study is based on secondary data gathered from various newspapers, reports, journals and websites. Help has also been taken from various research articles to develop an understanding and insight regarding the quality of work previously done in this regard. The limitation of the paper depends upon the quality, reliability and accuracy of data obtained from various data sources; however efforts have been made to make use of only authentic source of information to the maximum possible extent.

**Keywords: Economies, economic power, BRICS nations, opportunity, per capita income**

**0512188 ROUT, BAIJAYANTI (Central University of Gujarat, Gujarat). WHETHER MINING IN ODISHA LEADS TO GROWTH OR DETERIORATE ENVIRONMENT**

Most of the world economies are benefited from the mineral extraction which contributes significantly to the growth and development of that economy perpetuating the main destination of MNCS. Odisha is the largest mineral reservoir in India which is contributing about 34.3% to the GDP of the country. Though Odisha has the huge mineral resources, the mining sector has impacted adversely to the environment as well as local community. The paper mainly attempts to focus on the mining activities in Odisha, which affect the environment. The data collection method mainly involved secondary data which includes various government reports and economic survey of Odisha as well from different papers. The findings of the study showed that the mining activities in Odisha have impacted and depleted the environmental resources and at the same time it also affects the local communities adversely. Though the expectation of economic growth in the state is much more due to the huge potentiality of mineral resources, the environmental cost of the mining activities would be a serious health risk and ecological imbalance. The huge amount of mineral products such as Chromites, Nickel, Iron, Manganese, Tin, Graphite, Bauxite and Lead are available in the state.

**0512189 RYMBAL, MOTIKA S. AND THANGKHEW, DARISHISHA W (North Eastern Hills University). NRHM AND HEALTH SPENDING CONVERGENCE IN NORTH EASTERN STATES OF INDIA**

The north eastern region of India comprises of eight states for which seven states fall under small and special category states. The north eastern states consist mainly of rural regions with more than 85 percent of population living in rural areas. This demographic distribution leads to ensure availability and accessibility of healthcare to greater extent. Though, the North Eastern region comparatively does well on many health indicators than most of big Indian states, but its health infrastructure and accessibility is still a grave concern. Therefore, the study aims at finding the overall efficiency and quality of the health expenditure in the north eastern states and tries to analyse whether the NRHM Act 2005 turns to be instrumental for streamlining the health expenditure of these states or not. The study uses the log linear dummy model to identify the convergence of North Eastern states in terms of health expenditure. The findings of the study turn to be unique and surprising. The study found that except Assam and Manipur the per capita health expenditure of North Eastern states is inelastic. Further, the study found that the North Eastern states do converge post NRHM. The growth of health expenditure for small states of North East turns to be higher than big states after the implication of NRHM.

**Key words: Health expenditure, NRHM, Convergence, Elasticity, North East**

**0512190 SHASHIDHAR, J (Bengaluru Central University, Department of Economics, Bengaluru). FINANCIAL EDUCATION AND FINANCIAL LITERACY FOR YOUNG INDIA (UPCOMING GENERATION)**

The present paper entitled 'financial education & financial literacy for young India' is an attempt to the present situation prevailing in our society and the need for financial education to the upcoming generation of India. This paper attempts to focus on understanding broad financial areas including managing personal finance, money and investing. It also attempts to provide a useful insight on the level of financial knowledge among the college students and the requirement of implementation of financial education in the college education system. The 'Financial Education', the end product of the paper is to develop an awareness about financial skills among the young generation of India to understand the very basics of savings, investments, debts & loans, income & its management. The prime object of this paper is to make youngsters financially independent and create an awareness regarding financial crisis and its management. Methodology adopted will be primary investigation method for which questionnaire shall be framed to collect the data required. Analysis of data obtained about the requirement of financial education shall be made by using relevant analytical methods. The findings and conclusions shall be

obtained based on the data collected by the questionnaire in BENGALURU CENTRAL UNIVERSITY from where the samples will be chosen.

**Key words: Financial education, Savings, Investment, Financial crisis, Financial management.**

**0512191 SHRIVASTAVA, JAYA (Department of Sociology Babasaheb Bhimrao Ambedkar University, Vidya Vihar, Lucknow). GENDER BUDGETING FOR EMPOWERING MARGINALISED WOMEN IN INDIA**

Gender budgeting refers to the process of conceiving, planning, approving, executing, monitoring, analyzing and auditing budgets in a gender-sensitive way. In other words, it refers to as, mainstreaming public policy, regulations, allocations, taxation and social projects from the viewpoint of their effect on the status of women in a given society. It involves analysis of actual expenditure and revenue (usually of the Government) on women and girls as compared to on men and boys. It helps Governments to decide how policies need to be made, adjusted and reprioritized. It provides policy framework, methodology and a set of tools to assist governments to integrate a gender perspective into the budget. It is a tool for effective policy implementation where one can check if the allocations are in line with policy commitments and are having the desired impact. It is perceived as crucial from the point of view of equity and efficiency.

Gender budgeting is not an end in itself. It is widely accepted as a powerful tool or means for achieving gender equality and women's empowerment. The present study tries to analyse the role of gender budgeting for empowering marginalised women in India. Empowering the marginalised section of society including women is the integral part of all development efforts by state. Gender budgeting has been extremely useful to seal leakages that disempower marginalised women and deal the issues of employment, educational opportunities, skill development, entitlement and assets ownership. The paper concludes that if marginalised women were given equal opportunities, treatment, remuneration and share in property it would be possible they would be active participant and beneficiaries in the development process.

**Keywords: Gender budgeting, Marginalised women, Empowerment**

**0512192 Shukla, Upendra Nath (Amity Business School, Amity University, Lucknow, Uttar Pradesh). DEMOGRAPHIC INEQUALITIES IN LIFE INSURANCE DEFICIENCY AND ECONOMIC GROWTH IN INDIA**

Insuring risks in a modern economy has cascading effect, affecting many aspects of our lives. The significance of the insurance industry for an economy is usually estimated in terms of size of its market, employment created, risk indemnification and its contribution to the GDP whereas it actually plays a pivotal role in the modern society, being a necessary precondition for many activities in manufacturing and service industry without which these business would not flourish in current socio-economic scenario. Insurance is a key component of economic development. The availability of insurance has many positive effects. It is seen that, being uninsured is the costliest option – for an individual in longer horizon, for the individuals, society and economy as a whole.

Many constructive and accommodating effects of insurance are either neglected or not fully considered in all their implications while implementing them through value chain using distribution channels. Despite the risk-sharing ability the insurance is still not fully understood by all key participants. This is a misfortune from an intellectual point of view along with a real waste of possibilities for developing modern economies in an efficient manner for enhancing productivity of factors of production and service.

Consequently, this article explores that- what are the deficiency that exist in life insurance and their implications on economic development in India. A survey of 202 customers is done in Agra, Ghaziabad-Noida and Varanasi to understand their Risk coverage by different insurance products to estimate deficiency of life insurance and then variance of deficiency with respect to demographics is seen, it is found that deficiency is found significant with gender, age and level of income of respondents. It's seen that level of development of insurance premium



improves the level of development of economies all across the globe. In India there are tremendous chances of growth of insurance sector considering the changing socio-economic scenario in digital era having more exposure of financial risk.

**Keywords: Life insurance, Risk Coverage, India, Economy, Superior Goods, Development**

**0512193 SINGH, VANDANA AND KHAN M S (Babasaheb Bhimrao Ambedkar University, Lucknow) A STUDY OF CONSUMER PURCHASE OF GREEN PRODUCTS IN INDIA**

This research paper investigates the dimensions influencing consumers' purchase intention of Green Products in India. The conceptual model for this study is based on the theory of planned behaviour (TPB), the hierarchy of effect model and theory of decision making. There are four dimensions of this framework influencing, cognitive and affecting, evaluation of alternatives and purchase intention. According to the theory of planned behaviour and Consumer decision making process subjective matters and attitude plays a very important role in framing higher intention for purchase of products. A higher correction of attitudes and subjective norms to behaviour intention and subsequently to behaviour has been confirmed in many studies. The hierarchy of effects model suggests that consumer goes through various stages before making buying decision. Findings of the study show that Indian consumers' purchase of green products is influenced by attitude, situational factors and subjective matters. And also pre-purchase evaluation and behavioural purchase intentions of the consumers are also affected by above mentioned dimensions. Attitude towards the behaviour, situational factors and subjective matters affects beliefs and attitude of the consumer and beliefs and attitude of the consumer affects pre-purchase evaluation. And finally pre-purchase evaluation affects purchase intention of the consumer of green products. This paper is based on secondary data and is completely deductive in nature.

**Keywords: Green Products, Pre-Purchase evaluation, Purchase Intension, attitudes, beliefs.**

**0512194 SINHA, P. K. (Dr. Rammanohar Lohia University, Ayodhya), MACRO-ECONOMIC PERSPECTIVE OF NEW INDUSTRIAL DEVELOPMENT**

Employment/Unemployment is one of the main issues of macroeconomics. The picture of the situation in 2050 compared to present might appear frightening from the point of employment. But, the pace which the change is being visualized by experts may not be quite what one may see at the ground level. There will be different types of vehicles on the road, driving at different speed. All trucks and cars may not become driverless. It may be possible to avoid collision. Recently two women pedestrians were killed while trying movement of driverless cars in the city in America. So it is not easy. No another in the USA has so far given permission for a driverless vehicle to operate on the road. Moreover if a chip in the vehicle suddenly manufactures the cars might abruptly stop. It will require special effect to move it to the side be involving a driverless car? Today fling up the truck are can drive four or five hundred kilometres without stop. But in electric cars the battery will need recharge after every two hundred fifty kilometres. Therefore many- many prefer cars with two type of fuel, electric and petrol, with service stations for both. All there may not be driverless generation of solar energy requires large areas of land to put up solar panels. That in why in our country the first efforts are in the dessert area of Rajasthan. Germany is putting up solar panels on the sea. If the batteries are very heavy, they may not be proffered. So it does not appear that there will be complete cessation of are of coal and petrol. House of different types wil be built and all are not convenient for fabrication. Therefore all type of houses will be built by different methods. All this suggests that the rate at which the experts are forecasting loss of employment may not happen in fact.

**0512195 SOWMYA N (Bengaluru Central University, Central College Campus, Bengaluru). A STUDY OF INDIA'S DEPENDENCE ON IMPORTED TECHNOLOGY**

India is exporting IT technology in terms of exporting soft wares and human ware to developed countries. This, inter alia, has led to compensatory imports of products & technology to supplement overall growth. Trends

since 1995 indicate that there is dependence on imports since a long time. The time is now to reverse the trend to enable reduction in imports & boost exports to have an export led growth.

This leads to research questions:

1. How to reduce import dependence of India?
2. How to set the economy for export led growth?
3. Will answers to these two questions trigger net growth?

An attempt is made is here to find answers to these questions.

Data for the study will be from published reports by authenticated agencies. Data on overall exports & imports, commodity-wise details, category wise details on volume & value terms would be collected from 1995 to 2018. This data will form the basis for our analysis. First, tabular analysis would be done. The analysis of the trend, cycles & of irregular patterns will be done using time series analysis. Based on the continuity in imports & exports conclusions are drawn.

It is clear from the study that India is dependent on imports which has always exceeded exports. The time has come to make Indian economy lead the growth by exports. India has been lending its expertise in several areas by sending their well technologically trained manpower. In addition, it is necessary to mark out their areas of surplus in high value products & human resources. Efforts are to be made to internationalize human training skills in technology by opening up best schools to be into India. This is sure to trigger Export-Import growth on the lines planned by India.

**Keywords: Dependence, Growth, Technology & Export-Import led growth**

**0512196 SRIVASTAVA, ALPANA (Operation Management, QT, Economics, B.Com, Program Director, Amity University, Lucknow). HEALTH ECONOMICS, POLICIES AND SOCIAL BEHAVIOUR IN INDIA**

It is generally seen that the people living in developing or underdeveloped countries have lower life expectancy, more exposed to diseases, as compared to the developed nations. This basic notion has forced economist and policymaker to analyse and contribute in this direction. Moreover, if health and longevity increases then it increases income and well-being both thereby decreasing inequality in the society and reduces health burden of the nation. To study various dimensions of health economics is a complex phenomenon unlike all other economic theory. The demand and supply side of health and health care is highly complex as sometimes it is seen that with unaffordable prices it becomes almost necessary to consume the services. Health care expenditure is not by choice but rather essential at some point of time. Health economics is a branch of economics that deals with the issues related to efficiency, effectiveness, value and behaviour in the production and consumption of health and healthcare. In other words, health economists study the functioning of healthcare systems and health-affecting behaviours. With the change in health system over time there is a need to study the dynamic behaviour of various factors affecting individual health and society well-being to ensure economic growth. With changing time even as the Indian economy is growing, the government is facing the burden of communicable diseases as well as non-communicable diseases along with injuries. Thus, there is need for shift in government polices as also seen with new National Health policy 2017. As demand and supply side both are changing in health system hence government programs to cater supply side should be focused on improving health of people whereas demand side should focus on financing and addressing gaps related to equity and affordability of health care. Apart from the government side there is need to study the shifting lifestyle pattern, social norms and psychological behaviour of the people. The shift in lifestyle had led to increase in communicable diseases. New and innovative technologies had increased expenditure towards health care services. Emergence of private players in health and health care sector has changed rules and norms. The basic objective of study is to discuss physical, psychological, environmental, social and spiritual aspects of health economics. This can only ensure sustainable economic growth in long run.

**Key words: health economics, healthcare, social behaviour, communicable diseases, economic growth**

**0512197 THAWRE, VEENA (Department of Economics, Dr H,S,Gour Central University Sagar).  
ECONOMIC IMPLICATIONS OF GENDER BASED VIOLENCE IN INDIA:CURRENT  
SCENARIO**

India has one of the highest rates of gender-based violence in the world. But until now what has been less well documented is the economic cost to society of these horrific and unacceptable levels of violence. The report represents an important contribution to the fight against gender-based violence in India. National Family Health Survey suggests that 30 percent women in India in the age group of 15-49 have experienced physical violence since the age of 15. It has been seen that human cost of gender-based violence every day, but having a calculation of the national economic cost will serve as an important tool in our policy and advocacy efforts to end the suffering and injustice of this violence on a national level. The gender-based violence costs India between learned that individuals and families continue to bear the greatest proportion of costs due to GBV. This report provides new analysis, as well as an important reminder of the urgency of the work ahead of us to end gender-based violence. As highlighted in the recommendations, we need government to fully estimate the resources required to actually implement existing gender-based violence legislation. An effective Inter-Sectoral funding model is needed to better coordinate the national response and improve budgeting and implementation efforts. If we are ever going to stop this epidemic, more must be invested in prevention, not just in response. We hope this report serves to reinvigorate the national dialogue on GBV and helps inform action among civil society, business and government actors. In particular we hope this analysis can assist in the development of a multi-Sectoral National Strategic Plan on Gender-Based Violence, which we believe is an essential vehicle to deliver on the recommendations outlined in the report.

**Keywords:** GBV-Gender based violence, GII- gender inequality index

**0512198 VANATHI D (Bengaluru Central University, Central College Campus, Bengaluru). INDIGENOUS  
SCIENCE AND TECHNOLOGY–LIBERATION OF INDIA FROM POVERTY EFFECTS**

Science & technology have positive effects on alleviating poverty. In essence, the hunger index is about malnutrition and under-nutrition, The country's population lack potable water, poor sanitation and dangerous hygiene. Science and technology have had a major impact on society and their impact is growing by making life easier. Science has given the chance to pursue social concern such as ethics, education, and justice to create culture and to improve human conditions.

Perspective on the concept of contribution of indigenous science and technology in India human society is a strategy for making results to higher authority of Indian Government to reduce the impact of contribution of indigenous science and technology to rest of economic factors which are hunger, health sector, poverty, unemployment, environmental degradation, and ecological changes in ecosystem. There is thus a need to study the nature, evolution & application of indigenous technology in explaining its effects on poverty. The objectives of the study are:

1. To analyze the process of evolution of indigenous technology &
2. To examine its effect on alleviating poverty in India

**0512199 VISWANATH, N. S. (, Department of Economics, Bengaluru Central University, Bengaluru). IS  
INDIA ON RECESSION?**

Any emerging economy is on a path of change. The way the economy moves is functionally related to social & political responses. The characteristics of change is equally associated with responses of people to incentives, subsidies, support & institutions. There are evidences of economies leading to large scale collapse with ramifications on societal corrections. Given that India has been consistently showing signs of decline in growth rates for the last two years and that quarterly growth rates are hitting low to as much as 4.5%, there is a need to examine the trend in it.

There are trends to be observed with regard to inflation and unemployment rates. India is on the path of consistency with respect to inflation; while jobs are not being created in the blue chip sectors such as services.

Employment generation in public sector is almost nil except filling the posts which are vacant. The same trend is applicable in the Government sector. Every year routine advertisements are seen with similar numbers of posts. However, no largescale projects are on to create new jobs. Agricultural labour is at high cost and farm skilled labour is on the decline being replaced by technology. Health care & Education services are on the rise. Tutorial services in Education and Support services are on the verge creating jobs. The pace, however, appear to have been slowed down.

X-M sectors are on better growth; exports increasing rapidly as compared to imports. Agricultural & IT sector exports are on fast growth as compared to others. The share of Indian trade is yet make a dent in international markets.

Given this backdrop, the time is to answer three questions:

1. What is the rate of growth of GDP in India?
2. What are trends in Inflation & Unemployment?
3. Any trend of recession set in Indian Economy?

The study is based on temporal data. The study examines trend for the last ten years from 2008-09 to 2018-19. The data are culled out from Annual Economic surveys of Government of India which presented to Parliament just a day before the presentation of the annual budget of Government of India. The figures relating to GDP, inflation and unemployment and the rates form the base of the study. The figures during selected period would reveal the set trends of the parameters of the study.

The present study has revealed that India is on the verge of decline which may facilitate consolidation of recession in the immediate years come. Loss of jobs and strained inflation, in addition to decline in GDP, are sure signs of fall in the economic trends.

**Key Words & Phrases: Economy, Growth, Recession, Strained Inflation & Loss of Jobs.**

### 13. EDUCATION

**0513200 BOSE, ANURADHA (National Institute of Educational Planning and Administration, New Delhi).  
PROBLEMATISING INCLUSION IN HIGHER EDUCATION IN INDIA-INSTITUTIONAL  
DIVERSITY AND THE LEARNER'S IDENTITY**

**0513201 GHATAK, SANDIP KUMAR (Asansol Girls' College, P.O-Asansol, Dist-Paschim Bardhaman)  
TRIBAL EDUCATION IN THE GLOBALIZING ERA- A MICRO LEVEL STUDY OF  
ASANSOL INDUSTRIAL TOWN**

In order to understand the existing human society properly the study of human society through the lens of globalization is the need of the hour. The process of globalization immensely affected every corner of the human society and every stratum of the people. But the nature of effect among all the people and all the community are not the same. The nature of the effect among the marginal class of the society and other section of the society are not similar, even the process of globalization has both the negative and positive effect.

Though the tribal community and more particularly the Santhal tribes are not the dominant community in Asansol, but a significant segment of this industrial town. In this connection it should be mentioned here that, like other parts of the State of West Bengal the Santhals are also the dominant tribes in Asansol. The effect of globalization on education among the tribal community of Asansol is both negative and positive.

- (i) Since 2000 the academic background of the Santhals is improving gradually.
- (ii) Relations among the family members are changing slowly and as a result the relations between the ageing members and other members of the family are also changing.
- (iii) Indigenous Political Organization of the Santhal Community losing its authority in the life of the Santhals.
- (iv) The cultural world of the Santhal community is moving into a new direction.

In order to check the validity of the abovementioned statements both primary and secondary sources of data have been utilized in this study. Primary sources of data have been collected through interview of the respondents and from reports of committees and commissions appointed by the Government, archival materials, Government publications etc. Secondary sources include newspapers, published books, scholarly articles published in journals and periodicals.

The survey has been conducted among two hundred Santhals of five wards of the Asansol Municipal Corporation which are predominantly Santhal dominated wards in Asansol from the very beginning of their settlement and still continue to be so. For extensive field work for this survey a sample survey method has been adopted. For this purpose a total number of two hundred Santhals were selected for interview, the selected Santhals belongs to different sex and level of educational standard. Both interview and observation methods have been applied in the present survey. Thus, both quantitative and qualitative data have been used for the purpose of analysis.

- (a) Literacy rate among the Santhals is increasing gradually and a good number of Santhal students are attending college and university level of education.
- (b) As a result of revolutionary change in transport and communication continuous interaction with the non-tribal people the indigenous political organization of the Santhals have failed to retain their command over the Santhal community.
- (c) Due to regular interaction with the non-tribal students, values are gradually changing among the Santhal students which results a gap with their ageing member of the family.
- (d) The cultural world of the Santhal community is moving in a new direction which deviates from their tradition.

**0513202 GUPTA, VEERA (National Institute of Educational Planning and Administration, 17-B,  
Sri Aurobindo Marg, New Delhi-110016). CAPACITY BUILDING ORGANIZATION IN  
EDUCATION: A CASE OF SCERTS IN INDIA**

Capacity building means raising performance levels of individuals, organizations and also of systems through training, mentoring/shadowing, extension activities and other means to resolves challenges and contemporary issues. Indian education system has been facing issues of access, quality, relevance and equity ever since independence of the country. National, State and district level institutions have been established to raise the

performance level of different functionaries to resolve these issues. The paper discusses the issues being faced by the country since last ten years and the centrally sponsored schemes launched to combat these. The issues identified are Net Enrollment Ratios, Gross Enrollment Ratios of school education and training of teachers. The paper focuses mainly on role and functions of one category of institutions namely State Councils of Educational Research and Training in the country and its impact on the NER, GER and teacher training. The paper is based on literature review of the policy documents to establish, modify roles of SCERTs besides studies conducted to review its functioning. The paper concludes with the finding that though the institution of SCERT was established with broader meaning of capacity building covering all types of functions to be carried out by it. But the evaluation studies have pointed out that SCERTs have not utilized their own capacities to build capacities of the functionaries. It remains deficient and partial. The paper recommends strategies to improve its capacity building function.

**Key words: Capacity building institutions in India; role and functions of SCERTs; status of teacher training; Educational issues and SCERTs.**

**0513203 HULLYAL, JAGADEESH (Department of Education, Bengaluru Central University, Bengaluru).  
TEACHING EFFECTIVENESS OF SECONDARY SCHOOL TEACHERS IN RELATION TO  
ACADEMIC ACHIEVEMENT OF IX STANDARD STUDENTS**

Teacher effectiveness is an old concept to us. We have been listening that some teachers are the most effective ones. This means that those teachers have attained the needed competence in their roles and functions, such as the preparation and planning for teaching, classroom management, and mastery over the subject matter, teacher characteristics and their interpersonal relations. Also these teachers excel in their other personality characteristics. They are said to be the best teachers/effective teachers. Some teachers who are least effective are inferior in respect of their roles, functions and their personality characteristics. Most effective and least effective teachers being the end of continuum, in between these two ends moderately effective teachers lie.

- 1) To study the relationship between teaching effectiveness and academic achievement of boys.
- 2) To study the relationship between teaching effectiveness and academic achievement of girls.
- 3) To study the relationship between teaching effectiveness and academic achievement of rural students.
- 4) To study the relationship between teaching effectiveness and academic achievement of urban students.
- 5) To study the relationship between teaching effectiveness and academic achievement of students studying in government schools.
- 6) To study the relationship between teaching effectiveness and academic achievement of students studying in private schools.

In this study random sampling technique was used for the selection of sample. For the present study covers 200 secondary school teachers and 200 students were selected from Ranebennur Taluk by using random sampling technique.

- (1) There is a positive significant relationship between teaching effectiveness and academic achievement of boys.
- (2) There is a positive significant relationship between teaching effectiveness and academic achievement of girls.
- (3) There is a positive significant relationship between teaching effectiveness and academic achievement of rural students.
- (4) There is a positive significant relationship between teaching effectiveness and academic achievement of urban students.
- (5) There is a positive significant relationship between teaching effectiveness and academic achievement of government secondary schools students.
- (6) There is a positive significant relationship between teaching effectiveness and academic achievement of private secondary schools students.

**0513204 KAUR, RAMANDEEP (S.U.S. Government College, Sunam, Sangrur, Punjab). CLIMATE CHANGE AND HUMAN RACE**

Climate change is the main concern of all the living beings. Recently, Most of the inhabitants of the global village have participated in climate strike. Their aim: to make themselves heard as they protest global inaction and apathy on the issue of climate change. Arctic blast in US, forest fires in Amazon and Australia are the examples of climate change. A recent study by Lancet Countdown on Health and climate change reveals that severe malnutrition, infectious diseases and heart disease are increasing as temperature is rising, due to global warming. It results from numerous cofactors arising from the global economy's interdependence on carbon dioxide (CO<sub>2</sub>) emitting hydrocarbon energy sources. Smog in different parts of India is due to release of greenhouse gases at almost every stage of production, transportation, storage, delivery & disposal. Every young individual in this world, irrespective of their class and place in society, be empowered and echo Greta's words: "I have learned you are never too small to make a difference."

**Keywords:** Climate strike, Global warming, Smog

**0513205 MAINI, MONIKA (National Institute of Educational Planning and Administration, 17-B, Sri Aurobindo Marg, New Delhi-110016). MAIN IDEA OF THE UNIVERSITY IN DIGITAL ERA: USE OF ICT AND EDUCATION FOR TRANSFORMATION**

Digital space has played an integral role in massification of higher education. Though the digital resources have made significant contribution in making education available to masses, they have also reduced the human interactions between teachers and students in the digital Era. One of the most important concern of these reduced human interactions is the rising academic conflict that has become a dominant feature of Indian Public universities. With the help digital education resources higher education has expanded the information to the reach of masses, but with this information boom it has also brought us at the verge of what Kant described as 'Euthanasia of Reason'. Especially, for the students from marginalized sections of society, digital gap between have and have nots in terms of both resources and skills have resulted into a psychic struggle that teachers from privileged backgrounds sometimes fails to acknowledge. Hence, to survive in digital Era and to undertake the education for transformation universities need to find out unique ways to connect students and teachers from diverse background through dialogue, and discussions with in digital media.

Through this paper, the investigator invokes the idea of university given by German and Indian philosophers to understand the idealistic view of the education for transformation and the nature and basis of this education in contemporary Public University in digital Era. The main objectives of this paper is to understand the meaning of transformatory education explicit in the idea of university given by Kant, to understand how the idea of transformatory education was conceptualized by Tagore in Indian context and to find out the kind of transformation that is achieved by the integration of ICT in Indian public universities in digital Era and its implications for the foundation principles of the university.

Following the interpretivist paradigm, the paper critically looks at the principle defining the Kant's transcendental postulates of university education, and the idea of eastern university framed by Rabindra Nath Tagore. The theoretical underpinning revealed that the classical idea of the education for transformation was based upon several assumptions such as the Principle of Pursuit of knowledge for knowledge sake, Principle of reason, Principle of autonomy, Principle of unity of knowledge, Principle of commitment to objectivity, cultivation of mind, apolitical inquiry and so on. The changing academic scenario of the universities since the advent of digitalization of higher education calls for a re-examination of the ideals of transformatory education to develop a nuanced understanding of the relationship between teachers and students for bringing transformation through ICT in the contemporary university. The main question under consideration is how do use of technology enable or disable to conceptualize university as a community of scholars engaged in critical thinking under the constraints of massification of knowledge and diversity at university?

Further, through the analysis of data collected from in-depth interviews of thirty teachers and thirty students from the faculty of Social Sciences, University of Delhi, the paper will reflect upon the how various ICT resources are utilized by teachers and students and its impact upon critical thinking among teachers and students and transformation in dispositions of the students and teachers for catering diversity and critical thinking. The results reveal the existence of several classical principles that have continued among the changes brought by technology, along with the emergence of new areas where use of digital media resources creates conflict between students and teachers and affects their working as a community of scholars.

**0513206 MARDI, SPHOORTI (University of Delhi, New Delhi-110007). SCIENCE AND SOCIAL EMANCIPATION**

India is the only country in the world that constitutionally demands its citizens to be scientifically tempered. It is enshrined in our constitution as Article 51(a) that it is the fundamental duty of each and every citizen to inculcate and develop 'scientific temper'. It was Pandit Jawaharlal Nehru who first used the term 'scientific temper' in India. Nehru wanted every Indian to be scientifically tempered, in the sense, that he expected every Indian to have a spirit of inquiry, a way of life, where nothing is accepted blindly, without trial and testing, and ability to change one's strongly held beliefs under the face of valid new evidence. Nehru and his contemporaries like Sardar Patel, Sarojini Naidu, Meghnad Saha, B. R. Ambedkar, and many others felt that it was lack of 'science' and 'scientific temper' in India and her citizens which was the major reason for country's backwardness. Nehruvian vision on 'science' and 'scientific temper' was meant to be the panacea for our long and dark history rigged with social inequalities, superstitions and blind beliefs due to religion.

Science was supposed to act as a liberating force and the study of science was supposed to automatically inculcate scientific temper and in turn improve and transform the social health of our country. This was expected because of the role science and technology played during and after Renaissance and Enlightenment, which led to the transformation of the then existing society from the shackles of authority of church. But does science still carry the emancipatory power even in today's time? Can science really bear the burden of being a force of emancipation in current times? Is scientific knowledge still emancipatory?

This paper tries to explore the relationship between study of science and technology and their effect on social transformation of our country. Whether the study of science and technology leads to a just, equitable and democratic society? The researcher has tried to reflect on and explore the above questions by reviewing of relevant scholarly literature. It would be argued that the emancipatory role of science and technology has become obsolete, once they have been institutionalized and professionalized. The research paper is an attempt to understand and explore how the changing nature of science and technology and their education have in turn affected the emancipatory significance attached to them.

**0513207 MARY, S. AROKIA (School of Education, Central University of Kashmir). DEFAMILIARISING HIJRAS: DYNAMICS OF LEGAL RECOGNITION, EDUCATION AND MODERNITY**

Defamiliarising *Hijras* attempts to address two objectives. Primarily, to challenge the conventional and popular *hijra* identity through the life histories of three *hijra* respondents located in the contemporary scenario. Defamiliarisation is a literary term coined by Victor Shklovsky to denote the process of making 'fresh, new, strange, different what is familiar and known' (Cuddon, 2014). Undertaking such an endeavour disrupts 'our habitual perception of the world, enabling us to "see things afresh"' (Baldick, 2008). The process of defamiliarisation would not only enable us to revisit the popular perceptions about the *hijra* community, but also to give insight about how education, modernity, and legal recognition have affected their lives. Secondly, through this paper the researcher wishes to examine the changes in educational aspirations of the respondents post National Legal Services Authority v. Union of India and Ors (NALSA) judgement.



Rooting from intersectionality and acknowledging multiple identities of an individual, life history approach was opted for. The idiosyncrasy of gender expression within the *hijra* community requires an approach which would voice their otherwise marginalised life contexts. Moreover, it would further aid in defamiliarising the popular *hijra* identity as recorded by media, accounts and older research studies. Life history is a full-length autobiographical account that provides a detailed understanding of the respondents lives from the beginning to the present (Ritche, 2003). The current study adopts the portal approach of doing life history (Linde, 1993). The portal approach, as Linde suggests could be used to learn about some external reality which the life history presents than the story itself. Life histories of three respondents were recorded over a period of three months. Four to six interviews were conducted with each respondent, spread across the three months duration of data collection. Using thematic analysis, keeping the set objectives as the analytical tool the findings were arrived at (Braun & Clarke, 2006). The limited studies pertaining to the *hijra* community in the past predominantly reinforce the popularised and stigmatised *hijra* identity, as in the anthropological works of Nanda (1999) and Reddy (2006). All other identity markers of caste, class, religion, ability (being educated), and region are somehow portrayed as to get subsumed under the *hijra* identity.

Satya, one of the respondents from Sukthankar (2007) voices his perceptions as, ‘The hijra identity has a historicity, it’s culturally located. Trans identity is urban, and has a strong class With respect to hijras, there are traditional rituals that are operative (intentionally underlined)’ (pg. 92). Using the life histories of the educated *hijra* respondents, the paper presents the subtle reformations within the *hijra* community and *dera*. In a way, it defamiliarises the stigmatised popularised *hijra* identity and pinpoints their struggles in the modern era, where legal recognition has been ensured post 2014 NALSA judgement.

At the educational front, NALSA has helped them claim their gender identity at educational institutions which otherwise was closeted. The educational aspirations of the respondents too transformed, thus causing a flux at the traditional *dera* set-up of the *hijra* community. The legal recognition not only impacted the individual lives of the *hijra* respondents but initial (minimal) structural level changes like issuing circulars to all the Universities of the country for their inclusion and reservations under OBC and economically weaker sections at school level has also been initiated.

**Keywords: hijra, education, legal recognition, and defamiliarisation**

**0513208 NEHA, AND K S ROOPA (Department of Human Development and Research Centre, Smt. V.H.D. Central Institute of Home Science, Seshadri Road, Bangalore). ATTITUDE OF PRIMARY SCHOOL TEACHERS TOWARDS LEARNING DISABLED CHILDREN**

Learning Disabilities (LD) are problems or difficulties related to the processing of information. A child would find it difficult to understand, articulate his/her thoughts in words, have problems in reasoning, and do mathematical operations would be a herculean task. Another disadvantage these children have is that since they look ‘normal’ to societal standards, their handicap isn’t considered or handled in the right manner. Instead, they are very often mistaken to be lazy, stupid, disinterested child. This further discourages children to take any sort of interest in their school work. Such children need to be handled with love and care and lot more patience, rather than being labeled or pushed away as a waste of time to be corrected or taught. An understanding of the condition is very important. It is very important for teachers to have the right attitude while dealing with learning disabled children.

The present study aimed at assessing and comparing the attitude of primary school teachers towards learning-disabled children of both government and private schools. The investigator developed a questionnaire to study the demographic characteristics of the respondents and the attitude of teachers with regard to learning disability in children. The total sample comprised of 400 teachers, of which 200 were from 16 government schools and 200 were from 16 private schools in Urban Bangalore city. Statistical analysis of the acquired data was carried out by applying percentages, mean, standard deviation, chi square and “t” test. The findings of the study revealed that there is a statistically significant association was found between the level of attitude among the government and private school respondents. The chi-square value being 73.37 was found to be significant at 1% level. It is also seen that the private school respondents had a higher attitude mean score percentage (M = 63.60%) when compared to

government school respondents (M = 53.10%) on LD in children. However, it was found that both the groups had a moderate attitude towards LD in children.

**Key words: Primary school teachers, attitude, learning disabilities, government and private schools.**

**0513209 OMAR, SHABINA NISHAT (Milli Al-Ameen College (for girls), University of Calcutta, Kolkata)  
INCLUSIVE EDUCATION AS AN EQUITABLE OPTION IN HIGHER EDUCATION FOR  
DIFFERENTLY ABLED STUDENTS**

Today, all across the globe, universal primary education has been established as the second of the Millennium Development Goals (MDGs). This is subscribed to by every country since 2000. It asserts the need for all children, including disabled children to successfully complete primary school in order to obtain quality education at par with that of their peers. This was outlined in the UN Convention on the Rights of Persons with Disabilities (CRPD). Although disability was not originally included in the MDGs, this was rectified in September 2010 when disability was officially acknowledged with regard to the MDGs. The second of the MDGs, universal primary education (UPE), was reiterated by a recent international human rights treaty, the United Nations Convention on the Rights of Persons with Disabilities (CRPD), when it came into effect in 2008. Article 24 states: States Parties recognise the right of persons with disabilities to education. With a view to realising this right without discrimination and on the basis of equal opportunity, States Parties shall ensure an inclusive education system at all level.

The International Association of Accessibility Professionals recognizes six different models for conceptualizing disability: social, medical, cultural affiliation, economic, charity, and functional solutions. Once universally accepted in the field, the social model of disability has been challenged. In a 2014 *Disability Studies Quarterly* article, students involved in campus disability groups note that they actively seek cures for their chronic illnesses and "question the rejection of the medical model" of disability. The cultural affiliation model accepts the person's disability completely and uses it a point of pride in being associated with other people in a similar condition. The economic model recognizes the effect of bodily limitations on a person's ability to work, and there may be a need for economic support or accommodations for the person's disability while the charity model regards people with disabilities as unfortunate and in need of assistance from the outside, with those providing charity viewed as benevolent contributors to a needy population. The functional solutions model of disability is a practical perspective that identifies the limitations (or "functional impairments") due to disability, with the intent to create and promote solutions to overcome those limitations. The primary task is to eliminate, or at least reduce, the impact of the functional limitations of the body through technological or methodological innovation. The pragmatism of the functional solution model deemphasizes the socio-political aspects of disability, and instead prioritizes inventiveness and entrepreneurship. This is the prevailing opinion behind compliance literature that promotes self-efficacy and self-advocacy skills for people with disabilities preparing for transition to independent living.

In most countries, especially India, the educational opportunities for differently abled students in higher education are either inappropriate or unaffordable or non-existent. One of the best ways to impart quality education to all such students would be inclusive education, where all may study under the same roof and imbibe the same quality of education which will thereafter enable them to equal opportunity in later life such as a better job, more social and economic security, and more opportunities for full participation in society. This is an idealized vision in the world today as students with disabilities are still disproportionately excluded from the purview of education. There are approximately 106 million people with disabilities across the world. Nearly one third of them are denied education.

This paper seeks to define inclusion as an equitable option in the context of the higher education scenario of India, drawing examples from other countries and aims to highlight specific methods of integrating disabled children into mainstream education by adapting several international practices and procedures.

**0513210 PANDA, TWINKLE (National Institute of Educational Planning and Administration, 17-B, Sri Aurobindo Marg New Delhi-110016). REFORMING GOVERNANCE IN HIGHER EDUCATION INSTITUTIONS OF ODISHA: IMPLICATIONS ON INSTITUTIONAL PERFORMANCE**

Formulation and implementation of policies, continuous monitoring, functioning with a smooth and unified system are subject to the need the governance system which must work for the both public and private sectors. Across India governance has been an immense issue and mostly at tertiary level. Globally governance reform plays a pivotal role where most of the countries fasten this reform and the impact of reform on five Asian countries as case (China, Cambodia, Japan, Indonesia, Viet Nam) and the study found that the increased autonomy was the pillar of improvement in the system as a sequential process to allow for progressive adaptation within HEIs. Odisha as a state also reflects the same where unemployment is highest because of quality issues in university system and there is no follow up of affiliated colleges by the affiliated universities which is key to quality enhancement. The governance of the universities and colleges became one of the key issues where the Department of Higher Education, Odisha sought for advice from the World Bank on setting up an enabling framework of organizational structures. Resulting out of 162 government colleges only 32 colleges have achieved autonomous status and only 14% of colleges in Odisha have achieved NAAC recognition. Firstly, why this status of autonomy is important, Secondly, what are the developmental status of autonomy to the colleges, next how this autonomous status is helpful for institutional performance and lastly, what are the issues of non-autonomous colleges are the thrust areas of the paper. To accomplish this both qualitative and quantitative data have been used. In qualitative part, documentary analysis of the records, annual reports and position papers and in quantitative part, UGC data base, AISHE reports, OSHEC reports have been used. The study brought a number of issues with non-autonomous colleges which needs to be resolved.

**Key Words: Governance, Autonomy, Autonomous colleges, Non-autonomous colleges, Institutional Performance**

**0513211 RAJ, A.P.FELIX AROKIYA AND ARAM, IARUL (National Institute of Technical Teachers Training and Research, Chennai). FACTORS AFFECTING THE SUCCESS OF ONLINE EDUCATION IN INDIAN MOOCS**

The recent popularity and support to online education are tremendous in India with many higher educational institutions getting involved in Massive Open Online Course (MOOC). The flagship Indian MOOC programmes are National Programme for Technology Enabled Learning (NPTEL), Study Webs of Active Young Aspiring Minds (SWAYAM), IIT Bombay Project (IITBX), and Annual Refresher Programme In Teaching (ARPIT). The success of the Indian MOOCs depend on the quality of the online education system. However, the quality of massive open online courses is very difficult to measure because of diverse opinions among the different stakeholders of MOOCs. The varied motives, objectives and behaviour patterns of online learners reflect the multidimensionality of the term “success” in online education system. Literature review on MOOC studies has revealed that key factors are affecting the MOOC success. They are learner characteristics, instructor, pedagogy, engagement level, instructional design, evaluation, analytics, attrition rate, and quality. The objective of this paper is to understand and analyze the different perspectives of MOOC stakeholders in India. The stakeholders taken for the study are learners, instructors, and coordinators of a massive open online course. This study will be beneficial to MOOC scholars, administrators, and policy-makers in providing clarity on factors affecting the MOOC success in India.

**Keywords: MOOCs, Online Education, Pedagogy, Teaching-Learning Process, Technology.**

**0513212 RASTOGI, SHRUTI KIRTI (Dr. Shakuntala Misra National Rehabilitation University, Lucknow). EXTENDING THE AMBIT OF INCLUSIVE EDUCATION TO BENEFIT THE LEARNERS WITH MUSCULAR DYSTROPHY: A CASE STUDY**

**Muscular Dystrophy** is a group of diseases that cause progressive weakness and loss of **muscle** mass. In muscular dystrophy, abnormal genes (mutations) interfere with the production of proteins needed to form

healthy muscle. Consequently, with time, the afflicted loses the ability to even carry out an elemental function like body movements. It is an agonisingly painful phase in the patients' life as they battle with the disease that threatens to choke their chances of sustenance with each passing day. Even more dismal is the lack of awareness regarding the disease, hence, the possibilities of creating appropriate scaffolds to facilitate the well-being of people afflicted with muscular dystrophy is minimal at present. This lacuna is more entrenched in education. It is pertinent to refer to the Rights of Persons with Disabilities Bill – 2016, in this context. With the amendment now, the Government of India has extended the ambit of Disabilities from 7 to 21, with muscular dystrophy indicated *as separate class of specified disability*. Given this premise, it is imperative to note that it is now a mandatory clause for all the government funded educational institutions as well as those recognized by the government to proffer inclusive education to such learners. In this contextual frame, this study attempts to present 5 case studies pertaining to learners with muscular dystrophy. The author has personally witnessed a lack of information among the parents and, therefore, their inability to help their children affected with muscular dystrophy, especially in the case of Duchene muscular dystrophy. Hence, as a long-time personal goal, she developed this study to address this lacuna. Case studies are based on semi-structured interviews which were conducted with five parents. Analysis of the interview data indicated the willingness of these parents to share information to empower others like themselves. The study etches conclusions that recommend a host of solutions aimed at redefining pedagogies to empower the learning abilities of students with muscular dystrophy.

**Keywords:** Muscular dystrophy, Duchene muscular dystrophy, awareness of parents, inclusive education.

**0513213 SAHOO, JNYAN RANJAN (National Institute of Educational Planning and Administration, 17-B, Sri Aurobindo Marg, New Delhi-110016). FINANCING HIGHER EDUCATION IN INDIA: PROBLEMS AND PROSPECTS**

The paper is an attempt to explore the status of higher education in India in terms of student enrolment and institutional growth. Secondly paper tries to explore the status and to discuss causes and rationale for financing higher education from general tax revenue. For making paper more analytical some important reforms have been discussed substantially. Accordingly some of the alternatives like; educational loans, graduate taxes, student fees, as non-state financing has been discussed. The study is descriptive in nature and has been used secondary data from Ministry of Human Resource Development database, Government of India, Census 2011, Various report of NSSO and from some other relevant studies. Findings of the study reveals that in 21<sup>st</sup> century financing from general tax revenue is not adequate, though there are significant causes for financing higher education is there. There are significant socio-political, economic realities for financing of higher education from general tax revenue, but as that is inadequate, a mix method model should developed to financing higher education. It also argues for the structural policy for serving students from different socio-economic category in higher education.

**0513214 SALUJA, ANSHUL (National Institute of Educational Planning and Administration, 17-B, Sri Aurobindo Marg, New Delhi). INEQUALITIES IN SCHOOL PARTICIPATION AND THE ROLE OF HOUSEHOLDS' SOCIO-ECONOMIC STATUS**

To find out the factors that influence the school participation in rural areas of Faridabad, a district of state Haryana, a household-level survey was undertaken. The analysis of the data obtained from a sample of 190 households revealed that the need to get their children into the schooling arises by the priorities the households set for education. And these needs arise out of their preferences, background factors and expectations of the community at large. In this entire process of enrolling a child in a school and retention, the social categorization and economic background act as influential factors. Along with this the parental occupation and education, the demographic structure of the households also play an important role.

**Keywords:** Elementary education, participation, households, socio-economic status

**0513215 SHANKAR, G. (West of G. D. College, Pipra Road, and P. O.: Dumri, Via: BRTS, Begusarai, Bihar). TEACHER EDUCATION IN FINLAND: AN ANALYSIS AND INPUTS FOR INDIAN SYSTEM**

Teacher Education occupies a position of paramount importance now-a-days. The 11<sup>th</sup> Education for All Global Monitoring Report (UNESCO, 2014) clearly says that good teachers are essential for enhancing the quality of learning and teacher education is important because of its impact upon teacher quality. This is the demand of the day that teacher education must shape teachers possessing multiple skills and competences. India with its huge population is looking for newer ways and approaches to improve its teacher education system to keep sync with current social, cultural, technological and economic situations. In addition to age-old mandate of preparing qualified and humane teachers, the teacher education system has to take into account the ever emerging challenges and changes emancipating from society, economy and technology. Finland has a sound system of Teacher Education. It improves every day. Reflecting on these observations, it can be argued that a study of Finnish Teacher Education System may also be useful in the Indian context. In order to extend this argument, the present research is conducted to study the policies and practices of Teacher Education in Finland, to analyze the strengths, challenges and recent debates in teacher education in Finland and to identify useful lessons from Finnish system for benefit of teacher education in India.

This study is mainly based on the review and analysis of policy document and practices as well as other available literature and statistics related to teacher education in Finland. A number of discussions with teacher education specialists, policy makers and practitioners and their inputs have also been used to detail the existing system and recent debates about teacher education.

So far the expected outcome of the study is concerned, it is hoped that analysis of teacher education policies, practices and debates in Finland and suggested inputs will help the government agencies and policy planners in India to make teacher education more relevant and quality oriented.

**Keywords: Teacher Education, Finnish system, Indian System, policies, practices, debates.**

**0513216 SHARMA, JINNY AND MEHRA, ANJALI (Punjab School of Economics, Guru Nanak Dev University, Amritsar). EXPLORING RELATIONSHIP BETWEEN GROWTH OF PROFESSIONAL INSTITUTES AND SHADOW EDUCATION**

Cut-throat competition in the varied entrance exams for admission to the big and prestigious Medical and Engineering colleges of the country has become tough nut to crack and here Shadow education comes as a rescue. This has almost engulfed every major city and town of the country to fulfil the need and aspirations of the students to pursue their dream for engineering and medical education. . These shadow education service providers plays big role in preparing students for the entrance exam race, which has resulted into big demand of their services. From traditional class-room type of coaching to digital platform, these private tutoring businesses has evolved with the time. And not only limited to this, many of the coaching providers have expanded to one class-room centres to big incorporated entities and holds major market share of the education industry. This paper attempts to relate the growth of engineering and medical colleges in the country on the one hand and its impact on the rise of Shadow education on the other. It further tries to relate that increased competition for the entrance exams of the professional institutes has resulted into spread of Shadow education in the country, which has resulted into rise of coaching culture.

**Key Words: Private tutoring, entrance exams, engineering and medical colleges.**

**0513217 YADAV, RENU (Department of Education, Central University of Haryana). A STUDY OF IMPACT OF ORGANISATIONAL CLIMATE ON PERFORMANCE OF WOMEN TEACHERS**

Present study aimed at knowing the factors within working environment such as wages, working hours, organizational structure and communication between employees and management may affect performance of women teachers. It is expected that outcomes of present study will be valuable asset in studying problem faced by women in their organizational climate which influence their job performance.

- Exploration of organizational factors affecting job security among women teachers in higher education.
- Exploration of organizational climate factors affecting job performance of women teachers.

In the present study the researcher used mixed method approach to accomplish the research work. Descriptive survey method was used for quantitative research and personal interviews were conducted for qualitative research to explore the research questions by the researcher. Nine Degree colleges from Haryana was sample for data collection.

The result of the study revealed that organizational climate has insignificant impact on job performance of permanent women teachers of government colleges. The result of the study revealed that organizational climate has significant impact on job performance of contractual women teachers of private colleges. The result of the study also revealed that organizational climate has insignificant impact on job performance of permanent women teachers of private colleges. In this study it was also demonstrated that organizational climate has insignificant impact on job performance of contractual women teachers of University. So it can be concluded in the light of the above findings that organizational climate has no significant effect on the job performance of women teachers except contractual teachers of private colleges. However, qualitative data suggest that even for the permanent teachers they faced discrimination in terms of opportunity for professional development.

#### 14. ENGINEERING SCIENCE

**0514218 LAKSHMI, K. R. AND JAGANNATHA, VENKATARAMAIAH (135,22<sup>nd</sup> Cross, 3<sup>rd</sup> Stage, D block, Vijayanagar, Mysuru, Karnataka). ECO-SENSE MICRO-STORMWATER HARVESTING SYSTEM IN URBAN REGION-A CASE STUDY**

Water scarcity is threatening quality of life in urban settlements. Stormwater harvesting system is the process of collecting natural precipitation from prepared watersheds for beneficial use. Community based water supply systems like institutional stormwater harvesting are promising solutions to deprived local water supply. This paper finds application in designing and developing micro-catchment stormwater harvesting system (SWHS) at institutional level to reduce the pressure on drinking water resource. SWHS also provides an ecological ambience in educational institution and also improves the lung space of the area.

SWHS in Sri Jayachamarajendra College of Engineering campus Mysuru are qualitatively and quantitatively defined. The quantitative approach includes fixing boundary limits for the micro-catchment, area calculation, volume calculation and rainfall data analysis. For each of these approaches different methods are used to obtain the desired results. The quality approach includes soil sampling and analysis, rainwater characterization and geo-filter design.

The boundary for the micro-catchment was fixed based on the lowest and highest elevation points by making use of ArcGIS software version 10. Area calculation were done using google maps and for some of the buildings, ground level measurement was carried out. Sampling of soil in the study area was done using core cutter to analyse for basic parameters such as pH, organic content, nitrates and phosphates. The rainfall data obtained in surrounding seven rain-gauge stations were spatially interpolated using minimum and maximum rainfall values. To estimate the volume of stormwater that can be stored in the ponding area, it was necessary to find the flow accumulation in the ponding region. The flow accumulation is calculated using Arcscene software version 10. The rainwater that is obtained from three sampling points are collected and are analysed for various physico-chemical parameters to know the characteristics of the rainwater. It was found that the existing slope profile is sufficient to store the calculated volume of rainwater. The harvested storm water is passed through geo-filter unit to enhance the quality of storm water stored. In this paper an effort is made to quantify stormwater as a potential water source in addition to rooftop rain harvesting. Soil moisture enhancement could also be the benefit by resorting to use drains for percolation in addition to making best use by polishing for drinking purposes.

## 15. GEOGRAPHY

**0515219 ADHIKARY, BALAI AND RATH, KRISHNA CHANDRA (P.G. Department of Geography, Utkal University, Bhubaneswar). SCENARIO OF RURAL SERVICES DEVELOPMENT: A CASE STUDY AT KUMARARA GRAM PANCHAYAT OF PURBA MEDINIPUR DISTRICT IN WEST BENGAL, INDIA**

Quality of rural livelihood depends on the availability of existing rural services in the Panchayat area. Rural services consider roads, electricity, drinking water, primary education, health, cooperative and Gramin bank, play ground and market. Accessibility of these mandatory rural services is not so well in every villages of rural West Bengal. The main objectives of this work are to highlight the condition of rural services and measured the spatial variation in rural services development in the Panchayat area. Consider two hundred and sixty samples through random sampling method from thirteen villages. People's perceptions have been considered for come to the decisions. Applied mean and standard deviation methods to highlighting the inter village variation in rural services development. Inter villages disparities exist in the area in development of mandatory rural services and scenario of many villages are in poor condition. This work may be implement to measures the disparities in village services development in any rural areas of India and suitable for reducing disparities in rural development in future.

**Key words: Rural, services, spatial variation, development**

**0515220 ANSARY, RABIUL AND RATH, KRISHNA CHANDRA (Department of Geography, Utkal University, Vani Vihar, Bhubaneswar, Odisha). MIGRATION DYNAMICS IN ODISHA**

In best scenario because of demographic dividend when there is excess supply of labour than demand in a region, geographical redistribution takes place in the form of migration. Since the dawn of civilisation it is last but not the least, one of the alternative survival strategies left. In this context migration dynamics in Odisha state with respect to India over the last three decades in the context of demographic, social, political and economic upheavals try to find out how meaning of migration changed over the time and space. The panel data on migration (place of last residence) from census of India for last 30 years is used to study and understand the whole phenomena and process of migration along with developmental policy either to promote migration or to hold back migrants population or stopped further migration.

The share of migrants to the total population of Odisha is more than 36.6 percent in 2011 census which is higher than the previous census (30%). In other words, around four out of every ten people in the state is migrants. Total size of migrants (intra-state and inter-state) in the state in 2011 increased to 15 million from 11 million (2001) with registered growth rate 40%. Over the period of 2001 and 2011 census the proportionate share of inter-state migrants to intra-state decreased. Intra-state migration grew at 40% while inter-state migrants only 29%. Over the time period out migration for economic regions from the state observed slowdown in magnitude. In term of rural-urban composition in 2011 census proportionate share of rural migrants declined over urban migrants. Out of four migration streams (rural-rural, urban-rural, rural-urban and urban-urban) still rural-rural are dominant one in the state. In the pattern of inter-state migration although number of out migrants suppressed in migrants (net migrants) in the state over the three census decades (1991-2011) but magnitude of net migration rate in the state declined. In term of inter- state out migrants from the state the direction of migration stream and the destination states from the state changed. Although neighbouring states like Chhattisgarh, West Bengal Andhra Pradesh and Bihar are most favourable destinations among the Odiya migrants but KarnatakaTamil NaduKerala in the southern states are emerged as most attractive destinations in 2011 census. South Indian states like Kerala (205%), Karnataka (290%) and Tamil Nadu (266%) along with Gujarat (150%) registered phenomenal growth rate of Bengali while neighbouring states West Bengal (-10.3%), Andhra Pradesh (76%) and Bihar (-86 %) registered negative or slow growth rate. The study also found negative correlation between socio-economic and demographic development without-migration from the state.

**0515221 ARORA, KAVITA (Department of Geography, Shaheed Bhagat Singh College, University Of Delhi). PORTRAIT, ACTUALITIES AND CREATION OF KNOWLEDGE: CHALLENGES OF CONDUCTING RESEARCH ON ABORIGINAL TRIBES OF ANDAMAN AND NICOBAR ISLANDS, INDIA**

Satisfactory research on the aboriginal people always remain a challenge for the researchers .Every aspect of the producing knowledge regarding indigenous people has been influenced by the ways in which Indigenous ways of knowing has been presented. Research is linked in all discipline to theory. Like any other place Indigenous



people of Andaman and Nicobar, an Indian archipelago has been in many ways oppressed by theories. There are six indigenous communities the Great Andamanese, Onges, Jarwas, and Sentinlese live in the Andaman group of islands while the Nicobarese and the Shompens, which are of Mongoloid origin, inhabit the Nicobar group of islands. For these indigenous peoples, most of the theorizing has been driven by the images presented by either anthropological writings or the official records. Considering the range of documents, and the political process of documentation, including photography, the paper focuses on why there was a conscious effort to create an illusion about the realities of Andamanese in different phases of history and how these images affected the theories and consequently the research, policies and developmental process related to these indigenous people.

**Key Words: Aboriginal People, Images, Actualities, Knowledge**

**0515222 DANDAPAT, KISHOR (Department of Geography, Seva Bharati Mahavidyalaya, Medinipur). FOREST UTILIZATION PATTERNS AND SOCIO-ECONOMIC STATUS OF THE LODHA COMMUNITY IN RARH GEOGRAPHICAL AREA, WEST BENGAL, INDIA**

The Rarh region lies between the Chota Nagpur Plateau on the westland the chief flow of the Ganges River in the east. The Rarh plains comprise the lower Gangetic plains to the south of the Ganges river, and to the west of its Bhagirathi-Hooghly distributary. The elevation ranges between 75 and 150 m. The Lodhas are semi-nomadic denotified community, who are the Primitive Tribal Group (PTG) in this region. They are largely depending on the forest for their livelihood pattern. In this article, we have made an attempt to study the socio-economic status of the Forest Based Lodha community. To determine the socio-economic status an empirical study has been conducted and a simple random sampling method has been used for field study to collect the socio-economic related data.

**0515223 DAS, RIMA AND MONDAL, BIRAJ KANTI (Bhargar Mahavidyalaya). DYNAMICS OF URBAN EXPANSION AND ITS IMPACT ON ECONOMY AND ENVIRONMENT OF RURAL-URBAN FRINGE AREA OF KOLKATA: A GEOGRAPHICAL APPRAISAL**

Since the industrial revolution, the process of development and expansion of urban areas have occurred throughout the world. But in recent decades, the urban areas in many parts of the world have been experiencing rapid growth with serious consequences and opportunities on the environment and economy of the fringe areas. This paper examined the opportunities and challenges of rapid urbanization on the economy and environment of the rural-urban fringe area of Kolkata. After analyzing the population data and satellite images, it has been shown that, the Kolkata experienced rapid urbanization and outgrowth since 1991. In 1991, the area KMA was 1,350 sq km housing 12.5 million population, that area has increased to 1,886.67 sq km and population has exceeded 15.5 million in 2007. It has been visualized that population of KMA would increase to 22.04 million and approximately 5.80 million populations is going to settle either in municipalities and non-municipal areas within the KMA or outside it in 2025. This outgrowth and urbanization process, convert fertile agricultural land to urban landscape which has a detrimental effect on the agricultural structure in the fringe area of Kolkata. As consequences to this, the labour cost of the agricultural sector in the rural area and urban fringe area increasing hastily and sometimes they face the deficiency of labour. This leads to the hike in the price of agricultural products and some issues of food scarcity are also come to the forefronts related to this. Furthermore, this enhances the switched from traditional rice cultivation to cash crops and vegetable promotion to support the increasing urban population and their changing livelihood pattern by looking to their market demands. Therefore, continuous agricultural degradation happens in the fringe area. Along these economic changes, spatial transformation, ecological and environmental degradation have also perceived by analyzing the satellite images and structured interview method. These consequences and counter effects lead to the spatial changes to the land use of the fringe areas and the need of the hour is to formulation and implementation of proper integrated planning for the fringe area in particular and rural and urban areas as a whole which can act as the key of balanced and sustainable development of Kolkata. To mapped and analyze the spatial changes of the inter-regional and intra-regional variations of the urban fringe and metropolitan area of Kolkata, the techniques of geoinformatics and statistics are applied in the current study. The paper also recommended some solutions to combat with such economic and environmental challenges in the fringe area.

**Key words:** Urbanization, Rural-urban fringe, Agricultural structure, Livelihood, Environmental degradation.

**0515224 DASPATTANAYAK, PRITIREKHA (Department of Applied Geography, Ravenshaw University, Cuttack). TOWARDS INCLUSIVE AND SUSTAINABLE SMART CITIES: A STUDY ON BHUBANESWAR**

Despite slowing down of rate of urban growth, large cities continue to expand. As a result, urbanization creates challenges which must be overcome to uphold quality of life. Problems arising from urbanization can be remedied by administering intelligent connections solutions. Many countries and cities are already working towards making such intelligent living spaces the norm. The city of the future will be technologically smart and connected, so urban living spaces can be cleaner, safer and less stressful to live in. A 'Smart City' is one which utilizes intelligent and networked technologies to support in daily life. They enable us save time, utilize new forms of mobility and breathe cleaner air. In a nutshell, the technologies at the centre of a smart city work to improve general quality of life for its inhabitants. Fewer traffic jams, intelligent homes and an energy-efficient use of buildings are just a few tangible benefits. Smart Cities Mission, sometimes referred to as Smart City Mission: an urban renewal and retrofitting programme by the Govt. of India with the mission to develop 100 smart cities (by 2020) across the country making them citizen friendly and sustainable. Five pillars of a smart city are smart economy, smart people, smart environment, smart mobility and smart living- all of which need to go with smart governance. Nearly 14 million households live in urban slums across India with a further 3 million living on city streets. The drive for smart cities has already triggered evictions of people from slums and informal settlements in cities including Delhi, Bhubaneswar, Indore and Kochi without adequate compensation or alternative accommodation.

The major thrust of the present paper is to examine the challenges in developing Bhubaneswar into a smart city and initiatives by the State Govt. to make the city vibrant, viable, habitable inclusive and sustainable. Bhubaneswar is located in the district of Khurda and the administrative capital of Odisha. It is one of the cities selected under the Govt. of India's 'Smart Cities Mission' (SCM). Constituting an area of 186 sq. km, the city accommodates 8,43,402 population with 2,01,873 households. The decadal growth rate of the city 29.75 percent during 2011. The sex ratio is 892 females per 1000 males. There are 67 wards and the number of slums is 436. The study is based on secondary as well as primary sources of data. The secondary data is collected from Census publication and Bhubaneswar Development Authority. Primary data is collected by doing household survey of a select area with the help of structured questionnaire. The study concludes with policy prescriptions that should facilitate Bhubaneswar's transformation into an inclusive and sustainable smart city.

**0515225 GUCHHAIT, SANAT KR. AND GHATAK, SUBHAJIT (Department of Geography, The University of Burdwan). WINDOW VISION: OUTDOOR ADVERTISEMENT AND CITY LIFE IN MEDIUM SIZE TOWNS OF INDIA**

With ever increasing complexity in present day urbanism, the way through which people envisaged and experienced urban space and its associated everydayness has become an important theme in the field of urban planning and architecture. More than a catalyst of urban consumption and mass media, outdoor advertisement also contribute a lot in framing and anticipating city culture and its space mosaic. Therefore, with an intent to develop a fresh outlook of urban vision, this paper approaches outdoor advertisement as an important 'city lens' to experience the ongoing city life. In an exploratory mode, the research also highlights and differentiates the ultimate experiences of urban space both from the side of advertising practitioner as well as common urban spectator. Adopting the technique of 'window vision' from Dreiser's famous novel 'Sister Carrie', the present work — based on the empirical observation over four consecutive year — is an attempt to explore the role of outdoor advertisement as an urban spectacle in viewing the ongoing space dynamics and associated everyday culture of a medium sized town of India, namely Burdwan.

**Key Words:** Advertising space, Window vision, Urban Everydayness, Spatial entity, City vision

**0515226 HASSAN, MOHAMMAD IZHAR (Department of Geography, M. D. University, Rohtak). AGE TRANSITION AND YOUTH BULGE IN INDIA: ISSUES AND CHALLENGES**

A gradual realignment of vital rates in a population from a stage of high death rates and high birth rates to a stage of low death rates and low birth rates – a response to changing socio-economic conditions, is generally known as demographic transition. The process has significant bearings on key demographic variables such as size, growth and age structure of population having significant implications for social and economic change in a society. The onset and pace of transition has varied from one country to another depending upon levels of socio-economic development. While the developed countries of the west witnessed the onset of transition as early as in the 18<sup>th</sup> century, in many of the less developed countries including India, the process began only in 20<sup>th</sup> century. In India, demographic transition is said to have set in 1920s when death rates started declining. As elsewhere in the less developed parts of the world, the pace of decline was somewhat faster than what had earlier occurred in the developed countries. Average life expectancy that remained in the neighbourhood of 20 years for much of the past more than doubled between 1911-21 and 1961-71. A real dent in birth rates was, however, witnessed only in the 1960s. As a result of this time lag, India's population grew from 251.3 million in 1921 to 548.16 million in 1971. The recent past particularly since the close of 1980s has seen a significant decline in birth rates resulting in sharp decline in annual exponential rate of growth in population from 2.16 percent during 1981-91 to 1.64 percent during 2001-11. This has been accompanied by an unprecedented transformation in age-structure of population. Children below the age of 15 years account for less than one-third of the population now as against more than 41 percent in 1961. Correspondingly, dependency ratio – a ratio between dependent population (both young and old put together) and economically active population (in the age group 15-59 years), is down from as high as 87 percent in 1961 to a little over 65 percent in 2011. Average life expectancy in the country at present is very close to 68 years and, population in the age group 60 years and above account for marginally short of one-tenth of the population. With an absolute size of 331 million youths in the age group 15-29 years in one geographical location, India is said to be positioned in an advantageous position in terms of demographic dividend. However, it may be noted that this 'youth-bulge' in itself does not lead to any economic gain unless there are enough and decent job opportunities for the youth entering into workforce. This, in turn, requires adequate investments in areas of nutrition, health, education and skill. In addition, growing concentration of population in the older age brackets necessitates expansion of schemes related to social protection. Drawing evidences from varied sources, the present paper takes a critical look at India's prospect on this aspect.

**Key words: demographic transition, youth bulge, age structure, dependency ratio.**

**0515227 MISHRA, MONALISHA AND PANDA, G. K. (Department of Geography, Utkal University, Vani Vihar, Bhubaneswar). VULNERABILITY OF THE COASTAL ENVIRONMENT TO EROSION AND ACCRETION: A CASE STUDY OF THE MAHANADI DELTA USING REMOTE SENSING AND GIS**

The coastal environment of Odisha has a wide range of abiotic and biotic features arising out of the dynamic interaction of the fluvial, marine, aeolian and lacustrine processes around the river mouths and coastal tracts where the materials and processes are conspicuous. Along the Odisha coastal zone, the Mahanadi is one of the important rivers with a large catchment area, sediment and water discharge and an extensive delta with a network of distributaries. The Mahanadi river mouth is one of the major outlets of the Mahanadi delta to the sea.

Large amount of sediment transport from the river to the sea through the river mouth as well as the inflow of tidal sediments and materials from the longshore drift by the waves has created an ideal depositional environment. But, however, the trend seems to be changing under the impact of the recent trends in the process of development along the coast along with the climate change and sea level rise.

The study makes an in-depth monitoring and analysis of these changes along the coastal zone as well as around the Mahanadi river mouth region using the remote sensing data GIS. The study brings out the morphological changes over space and time in relation to the prevailing environment, shore processes and human interventions.

**0515228 MISHRA, SAPTAPARNA AND RATH, KRISHNA CHANDRA (P.G. Department of Geography, Utkal University, Vani Vihar, Bhubaneswar). IMPACT OF SEASONAL LABOUR MIGRATION ON LEFT BEHIND WOMEN: A CASE STUDY OF NUAPADA DISTRICT OF ODISHA**

Each winter season in the state of Orissa, starts a process of migration. The people of the western districts of the state of Orissa are the ones who migrate particularly of undivided Kalahandi, Bolangir, Koraput, districts (now known as the KBK districts). The phenomenon of migration is believed to have taken roots in the aftermath of severe drought of the 1960s. Today every year thousands of people across the length and breadth of the region leave their native village in search of food and employment and flock the brick kilns in the neighbouring state of Andhra Pradesh, the construction sites of the cities and also to the towns of the state. After the harvest there is no more work and Nuakhai or harvest related festivals bring in their own expenses for which loans are acquired and are difficult to repay. So most of them end up as bonded labourers being paid minimal daily wages. Alienation of land, labour and produce is the driving force for migration. Today there is no work for more than 80 days in some parts of the region. Hence there is no other option but to seek work in the brick kilns of Andhra or pull rickshaws in Raipur. The worst sufferers of such type of migration are women whether they migrate with the male members or are left behind. In case of the later the female-headed households are faced with the multiple tasks of not only running the household but also looking after the family, children and the aged. Exploitation of the women by the money lenders and other powerful and dominant persons lead to a situation where the women are most vulnerable. Many government organizations, non-government organizations, journalists, activists as well as individual researchers have done numerous studies regarding the seasonal labour migration. But most of the works are mainly confined to the people who migrate seasonally but the plight of migrants overshadow the miseries of left behind persons mostly women. It is a matter of great remorse that such a sensitive issue is less explored and sufficient remedial measures are yet to be taken. The main objective of this is to address the impact of labour migration on left behind women in Nuapada district (part of undivided Kalahandi district). This is an attempt to make people and policy making bodies aware about the sensitive issue with a hope elimination of the ill effects of migration on left behind women, empowerment of women and in migration prone areas in a rights based approach.

**0515229 RATH, KRISHNA CHANDRA AND DAS, MANAS RANJAN (P. G. Department of Geography, Utkal University, Bhubaneswar). DEVELOPMENT DYNAMICS AND THREATS TO URBAN WETLANDS: A CASE STUDY OF BHUBANESWAR URBAN COMPLEX**

Wetlands are vital parts of the hydrological cycle. They support exceptionally large biological diversity and provide a wide range of ecosystem services like water conservation, flood mitigation, groundwater recharge, microclimate regulation, enhancing aesthetics of the landscape. They also support many significant recreational, social and cultural activities, besides being a part of our cultural heritage. The Bhubaneswar, the capital city of Odisha state in eastern coast of India, is very rich in cultural heritage. It is also called temple city. The Ponds, Tanks and Water Bodies being an integral part of religion, culture, heritage and temples in Bhubaneswar, the city is very rich in wetland resources. As per a detailed survey carried out by us there are 97 important ponds/lakes/tanks within Bhubaneswar Municipal Corporation area. However, the city is experiencing very rapid spatio-temporal growth since 1980 at the cost of fragile urban and periurban ecosystems. So most of wetlands in Bhubaneswar are seriously threatened by conversion to non-wetland purposes, encroachment of drainage, through landfill, pollution (discharge of domestic and industrial effluents, disposal of solid wastes), hydrological alterations (water withdrawal and inflow changes), and over-exploitation of their natural resources resulting in loss of biodiversity and disruption in goods and services provided by wetlands. The present study is an attempt in this regard to focus the threats posed by such spatio-temporal development dynamics of Bhubaneswar urban complex so that the conservation practice of such urban wetlands can be ensured. The study also presents case studies on participatory approaches carried out by authors for promotion of heritage and religion based conservation of wetlands inside Bhubaneswar urban complex.

**Index Terms—Wetland, Urban, Development Dynamics, Bhubaneswar**

**0515230 REHMAN, S TUFAILUR (Odisha State Open University, Sambalpur, G M University Campus, Sambalpur). WATERSHED MANAGEMENT - A SUSTAINABLE PROGRAMME IN ODL**

### **INSTITUTIONS: A CASE STUDY OF BALANGIR DISTRICT IN THE KBK REGION OF ODISHA**

“Water” is life, hence an indispensable, finite and vulnerable resource. Being utilized rationally, it establishes a precondition for economic and social growth through the spectrum of environmental adjustments. “Watershed” is a natural entity, every part of which drains to a common point. Thus, the concept of “Watershed Management” found meaning and purpose to save and secure the configuration from deforestation, siltation, salinity and localized erosion. This indicates that efficient and effective management of the available water becomes essential for overall development, improving livelihoods and maintaining food sufficiency. Therefore, watershed management could be one of the sustainable strategies to cope with climate change managing scarce water resource. This paper describes some of the watershed activities dealing with water resource management.

Major Objectives:

- Differentiate between Conventional Method and ODL Method of Education
- Advantages of Watershed Management Programme in Open and Distance Learning
- Conserving soil and water and harvesting surplus water to recharge ground water.
- Adopting suitable cropping and crop management systems to promote sustainable farming systems and stabilize the crop yields.
- Promoting afforestation, horticulture and pastures on non-arable areas based on its land capability classes.
- Coping with Climate change to maintain ecological balance.

#### **0515231 SARKAR, KOYEL AND GUCHHAIT, SANAT KUMAR (Department of Geography, The University of Burdwan). AUTHORITARIANISM FOR THE SUSTAINABILITY OF BUILT-UP ECO-SPACE OF RAJ DYNASTY IN BURDWAN TOWN**

To clarify this perspective, methodology has been adopted through secondary data first, reflecting the wishful thinking of Kings of Burdwan for sustainability of built-up eco-space while primary data reveals its present status and human response for maintaining the sustainability of sensible eco-space. Present paper attempts to unfold the justifiability of authoritarianism for the sustainability of built-up eco-space which is not only a aesthetic aspect or recreational opportunity, but an emotional erg, proud privilege and nostalgia that was created by Burdwan King Sangam Rai during 1657. After independence the authoritarian outlook still persists as the University Authority has imposed restrictions and taken initiatives for conservation of the eco-space. To delve deeper into the aspect, the biography, narratives, historical archives and quantitative methods have been applied with the help of primary and secondary data source to justify the importance of eco-urban space in the age of rampant urban development.

**Keywords: Authoritarianism, Ecologism, Eco-Space, Statutory Body, Tragedy of Commons, Tragedy of Anti-commons**

#### **0515232 SEN, SWATILEKHA AND GUCHHAIT, SANAT KUMAR (Department of Geography, The University of Burdwan, West Bengal). BIOPHILIA IN URBAN SPACE: EVALUATING THE VALUE OF NATURE UNDER THE BACKDROP OF HISTORICITY AND MODERNITY**

This paper attempts to unfold biophilia of the people of a medium size town like Burdwan where historicity, authoritarianism, modernity as well as awareness of recent time green city space all are fabricating new urban dynamism expressed through the perception survey and quantitative techniques. As a strategy of qualitative enquiry to identify the key tenets of biophilic urbanism and thereafter implementation of biophilic city in a rapidly changing urban environment, some case studies are thoroughly judged. Thus, biophilia is an important tool for creating environments better suited to people (Robinson, 2017). Hence, biophilic urbanism can bring more significance of relationship between human beings and nature.

**Keywords: City space, Authoritarianism, Historicity, Modernity, Urbanites, Biophilic Urbanism**

**0515233 SHEKHAR, SULOCHANA (Central University of Tamil Nadu). SCIENCE AND TECHNOLOGIES FOR SLUM DEVELOPMENT**

As the world has transformed, so have urban areas. Today, cities are home to 54 percent of the world's population, and by the middle of this century, that figure will rise to 66 percent (UN-Habitat, 2016). As the current pace of urbanization is bound to accelerate in developing countries mainly in Asia and African countries. due to the factors of rural-urban migration, slum population is rising in India. The annual growth rate of slums from 2001 to 2011 is 2.51% and one in every six of India's urban households live in slums (Census of India, 2011). The increasing slum population is not only happening in major cities but the medium and small cities also face this problem. The government has taken many initiatives to improve the conditions of slums through various policies and planning programmes. Based on the characteristics of slums, slum in-situ development, rehabilitation, upgradation plans are prepared. To identify the slums which have to be developed under what type of slum development will be decided based on the availability of space within the slum or nearby areas. The use of geospatial technologies such as remote sensing, Geographic Information Sciences (GIS) plays an imperative role in slum planning. When the community participated in planning long with the technology, that will be the real development. The present study demonstrates the efficacy of geospatial techniques and the integration of community input for better planning of slums. Kalaburagi, a fast-developing second-order city has taken for this present case and Borabai slum area in Kalaburagi city as a sample slum area. Using ArcGIS-Community VIZ extension, and with slum dwellers' input an optimum slum development option will be selected for sustainable slum development.

**Keywords: Remote sensing, Geographic Information Science, Slum development, Kalaburagi**

## 16. HOME SCIENCE

**0516234 AGRAWAL, PALAK AND SANTHOSH, GEETHA (Department of Nutrition & Dietetics, Mount Carmel College, Autonomous, Bengaluru). CONSUMERS' KNOWLEDGE, PERCEPTION AND USAGE OF SPIRULINA**

Spirulina is gaining interest worldwide as a nutraceutical due to its numerous health benefits for humans creating commercial demand worldwide. However, it is an underutilized protein and iron source which can be used to combat multiple deficiencies. The aim of the study was to determine the consumers' knowledge, perception and usage of Spirulina and its products. A standardized questionnaire was used to elicit information on spirulina. The study was conducted among 18-30 year olds (n=100) in Kolkata, West Bengal. 91% belonged to high income group and 88% of the population was female. The findings demonstrated that 83% of the population was aware about Spirulina being an algae, 36% said that it contained 30-40% protein; 87% agreed that it contains more iron than raw spinach, 50% responded that it should be consumed at 0.5-3g/serving but only 26% have used it owing to health consciousness. 81% considered Spirulina as a super food while 95% knew it is a microscopic, filamentous, blue-green algae naturally growing in freshwater or sea water and is used as a food supplement for humans. Majority (62%) felt that Spirulina does not contain cholesterol while 91% considered it to have natural nutrition components and not synthetic. 78% knew that Spirulina can be consumed as an additive in food (pasta, dairy products, juices, etc). 84% of the population were aware that Spirulina cannot be consumed in any amount; 62% people stated it does not have any side effects. 48% of the population sometimes recommended their fellow mates to buy Spirulina or products made with it. It was noted that 47% of the population related development of new products with Spirulina as being nutritious and nearly 62% people felt Spirulina has a scope in Food and Beverage industry. The study concluded that awareness is much needed to propagate Spirulina as "food of the future" as stated by Food and Agriculture Organization.

**Key words: Nutraceuticals, Spirulina, Consumer knowledge, Protein, Iron, Future food**

**0516235 BETSY, S R (Department of Home Science, BCM College , Kottayam, Kerala). EFFECTIVE LEARNING TECHNIQUE - ITS EFFECTS ON THE LEARNING SKILLS**

The study on **Effective Learning Technique -- Its effects on the Learning Skills** is an attempt to develop an Effective learning technique (ELT) and to assess its effects on the learning skills of the students selected through Random sampling from 20 schools where the Awareness Programme on 'ELT' was conducted using the prepared Educational package comprising an E- learning material and a Booklet.

First an E learning material of 2½ hours duration was prepared as a power point presentation. The tips to learn effectively and systematically were disclosed under the heads Three keys for the success in life, Effective learning, Goal Setting, Learning in the classroom, Home learning, One hour study, Memory techniques and the tips for writing exam. A booklet on the topic was also prepared.

Awareness classes were taken in 20 schools using the power point presentation. Booklets were distributed among them. The effect of ELT was evaluated by conducting a Pre-test and Post-test using a questionnaire prepared by the investigator herself. The study put forwarded the following **conclusions**.

1. The Effective Learning Techniques (ELT) has a great impact on the learning skills of the children.
2. The ELT motivated the students to learn systematically.
3. ELT enhances the concentration Power of the students.
4. The ELT accelerated the Perceiving Skills
5. ELT Excelled the Grasping Skills of the students.
6. ELT enhances the Memory skills – Short term, Long term memories, Retention and Recalling processes of the brain
7. ELT bring out Creativeness in Writing the Exams.
8. ELT increased the Academic score of the student.

**0516236 JABEEN, SHAHISTHA AND SANTHOSH, GEETHA (Department of Nutrition & Dietetics, Mount Carmel College, Autonomous, #58, Palace Road, Bengaluru). BEHAVIOUR PRACTICES & EFFECT OF NUTRITIONAL COUNSELING AMONG DIABETIC CLIENTS**

Diabetes is a lifestyle disease which requires a multipronged approach for its management, wherein patient has an important role to play in terms of self-care practices. The study was conducted to assess the effect of nutritional counseling on behavior practices among people with Type 2 Diabetes Mellitus. A cross-sectional study using purposive random sampling technique was conducted among 150 subjects from selected Diabetic centers in Bengaluru. It was noted, 50% of clients with mean age of 40 - 60 years had undergone counseling. As per WHO standards (2017), 65% of the populations were overweight or obese with BMI  $\geq$  25. Moderate level of knowledge on diabetes was seen in 46% of the population. Self-care and diet practices were followed on regular basis among 85% of the participants. Regular physical activity was seen in both the genders with only 20% avoiding physical activity for varied reasons. Medication adherence was strictly followed irrespective of cost and traveling. Influence of counseling was better among the participant. However, 40% of them had medical professionals and family/friends as source of information on diabetes while only 20% of them had dietician as source of information. Nearly half of the participants would always check for nutritional labels before purchasing of food products. Sugar and sugar products need to be avoided completely in diabetes was opined by 40% of the population. It was seen that 39% felt diabetes has many restrictions, 18% found it as a warning while 7% of them found no restraints on diabetes. Awareness on myths of diabetes was noticed in 60% of the population. Quality of life was found to be better at the same time. Majority of the participants (90%) expected that the dietician will help them in management of diabetes and bring about suitable lifestyle changes. To conclude, the present study brings about the effect of counseling on self-care practices and role of dietician in management of diabetes.

**Key Words: Diabetes Mellitus, Behavior practices, Nutritional Counseling, Physical activity, Quality of Life.**

**0516237 KRITI, AND SANTHOSH, GEETHA (Department of Nutrition & Dietetics, Mount Carmel College, Autonomous, #58, Palace Road, Bengaluru). BUBBLE TEA: A REMARKABLE UPSURGE**

Prepared by brewing the camellia leaves and shrubs, tea is the most popular beverage worldwide. Recent in vitro studies as well as several human and animal studies have confirmed the health benefits of different types of tea. There are varieties of tea available these days such as Bubble tea, Organic tea, Green tea etc. Boba milk tea, also known as bubble tea, first became popular in the 1960s throughout Asia, and has gained more popularity in the United States and in Europe since 2000. Currently available online data shows that there is an increase in the consumption of Bubble tea worldwide, specially in India. On studying the consumer knowledge, perception and preferences towards bubble tea in Bengaluru (India) with the help of an Exploratory study using a structured survey of 200 respondents in Bengaluru through pre-tested questionnaires using convenience sampling, it was deduced that people are well aware of this recent trend and they are widely accepting it. However, the majority of Indian consumers still prefer the traditional tea (Chai) due to its nominal price, health benefits, consumer satisfaction and more importantly, because of habit. Bubble tea consumers in Bengaluru generally prefer going out to tea shops having a wide range of flavours as they have a good purchasing power to pay the premium prices for a regular serving of Bubble tea. Bubble tea consumption is comparatively more in professionals than in non-professionals. The young generation also seems to be inclined towards this trend. No addiction has yet been observed among the consumers.

**Key words: beverage, in vitro, bubble tea, consumption, perception, preference, trend, health benefits, consumer satisfaction, purchasing power, addiction**

**0516238 RAJ, KRITHIKA AND SANTHOSH, GEETHA (Department of Nutrition & Dietetics, Mount Carmel College, Autonomous, #58, Palace Road, Bengaluru). PLANT-BASED MEAT SUBSTITUTES: A GROWING TREND**

With rising health and environmental concerns, the concept of veganism and vegetarianism has grown tremendously in the recent years. This trend has given rise to novel food products like plant-based meat substitutes developed to mimic the functional and organoleptic properties of meat. Meat substitutes are commonly derived from plant sources such as soy, wheat, fungi, peanut and jackfruit. The protein content of soy-based and mycoprotein-based meat substitutes is said to be approximately equivalent to that of meat whereas meat substitutes have lower



amounts of SFA than meat. However, the nutrient profile of meat substitutes depends on the plant source used. Apart from the health benefits, recent studies are focusing on the role of meat substitutes in prevention and management of Type II diabetes, CVD, cancer. Though there are many health claims promoting the consumption of meat substitutes, there is a need to analyse the same. The consumption of meat substitutes is influenced by drivers such as health benefits, ecological welfare and environmental sustainability and barriers such as food neophobia, meat attachment and low sensory qualities. Meat still continues to hold a more superior position than meat substitutes, due to which the acceptance of the latter is relatively low. However, owing to the rise in the changing eating trends and diet diversity especially in India, it is perceived that consumers are most likely to buy plant-based meat. India can serve as a potential future market. Assessment and exploration of consumer perception of plant-based meat substitutes is the need of the hour.

**Key words: meat substitutes, health benefits, acceptance, food neophobia, meat attachment**

**0516239 SAH, AYUSHI AND PANDEY, SANGEETA (PG Food Science and Nutrition, Mount Carmel College, Autonomous, Bengaluru Central University, Bengaluru-560001). DEVELOPMENT & SENSORY EVALUATION OF GREEN TEA ENRICHED WITH BIO-ACTIVE COMPOUNDS**

Green tea (*Camellia sinensis*) is a non-fermented beverage which contains catechins and potent antioxidants. It somehow lacks essential nutrients such as iron and zinc which are the most important micronutrients required during adolescence. These are also the major nutrients benefiting in the relief of varied menstrual disorders such as dysmenorrhea, oligomenorrhea, amenorrhea, irregular periods, hypomenorrhea etc. The overall objective of the study was to develop a green tea enriched with bioactive compounds and study its organoleptic properties. In the study, ingredients like chamomile flower (*Marticaria chamomilla*), shatavari roots (*Asparagus racemosus*), moringa leaves (*Moringa oleifera*), fennel seeds (*Foeniculum vulgare*), cinnamon (*Cinnamomum zeylanicum*), and ginger (*Zingiber officinale roscoe*) were incorporated. Moringa is an iron rich ingredient while spices like fennel and cinnamon contain a good amount of zinc. Chamomile flowers and shatavari roots are well-known menstruation friendly ingredients having effective compounds in them. These are functional foods rich in iron, zinc, vitamin C, antioxidants and low in tannin which is considered to be an antinutrient present in green tea. In this study, green tea was the standard and variations were developed in different formulations. The two major ingredients (chamomile and shatavari) were variables in different formulations as 5% and 15% respectively in variation 1, 10% for both chamomile and shatavari in variation 2 and 15% and 5% respectively in variation 3. The sensory evaluation was conducted using a 7-point hedonic scale to obtain the best accepted product. The overall acceptability of the control (T0) and variations (V1, V2, V3) were found to be  $4.7 \pm 0.01^a$ ,  $5.3 \pm 0.01^b$ ,  $5.8 \pm 0.01^c$  and  $4.6 \pm 0.01^d$  respectively with a 5% level of significant difference and was statistically analysed. The sensory evaluation results proved that variation 2 with 10% chamomile and 10% shatavari was the best accepted product among all the teas with the significant difference ( $p < 0.05$ ).

**Keywords: Bioactive compounds, Chamomile flower, Shatavari roots, Moringa leaves, Fennel seeds, Cinnamon, Ginger, Menstrual disorders.**

## 17. INTERNATIONAL RELATIONS STUDIES, DEFENCE AND STRATEGIC STUDIES

**0517240 BARIK, HEMSAGAR (Centre for Inner Asia Studies, School of International Studies, Jawaharlal Nehru University, New Delhi). CONSTRUCTIVE ENGAGEMENT OF QUADRILATERAL POWERS IN DISSUADING CHINESE EXPANSIONISM IN SOUTH ASIA**

China has been strategically mounting in south Asia for many decades engaging itself in diverse sectors like economic, military, infrastructure, trade and maritime sector. As an observer member state in South Asian Association for Regional Cooperation (SAARC), it has exerted vigorous influence among south Asian countries. With her expansionist aspirations China had made a robust presence not only in south Asia but encompassing Indian region together with Indian seas in a pessimistic passion. By his expansionist maritime strategies like, String of Pearls, One Belt and One Road Initiative (OBOR), China–Pakistan Economic Corridor (CPEC), Port building in Indian oceans, China has been succeeded in possessing the major economic assets in the region and became a disincentive to Indian possessions. As a result in order to safeguard her assets and to provide counter-deterrence to Chinese influence, India has lucratively recognized a new alternative to backfire Chinese expansionist strategies that is to endorse much concerned “Quadrilateral Powers” mainly US, Japan and Australia in South Asia. More so the escalating assertiveness of Quadrilateral Powers in the indo-pacific and mounting apprehension over China’s striving Belt -Road connectivity project provided India a valuable prospect to uphold its markets and posture in south Asia which is immensely important to India’s growth and development. The foremost purpose of the study is to explore the potential and prospect of quadrilateral powers in restraining the China’s influence in South Asia, India’s, opportunity to repossess its assets and its position in the region, and will provide a broad outlook on prospects and repercussions for India in the Quadrilateral- Chinese contest.

**Key words: Quadrilateral powers, Influence, Deterrence, South Asia, Assets and Indian Ocean.**

**0517241 BARIK, PRVASINI (Centre for African Studies, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). LIBERATION MOVEMENT FOR DECOLONIZATION OF KENYA**

This study explores the causes behind the liberation movement for decolonization of Kenya and the contributions of people in this struggle. It explains the historical background of Kenya and gives a broad idea about the trade union movement which was playing major role in liberation of the country. This paper also narrates a comparative background of both movements and how it was interrelated to each other to protect the country from colonialism. The Mau Mau revolution was known as national liberation movement of Kenya which was led by the Kikuyu ethnic groups to free the lands from the white settlers and at the same time the trade union movement was already fighting for workers right and gave a platform to the workers to raise their voice against imperialist government. The Republic of Kenya is a larger agricultural land in Africa and land was the main sources of income at that time. The land was playing vital role in giving birth of the liberation struggle in Kenya. During the colonialism the white settlers alienated local people’s land under the leased system and later it declared African reserves under the Crown colony. Kenya had a very bad colonial experience with all the repressive policies which was implemented by the colonial ruler. When the colonial government drew the colonial boundaries among the East African territory it became more handiness for Imperial government but these boundaries harmed the sentiment of the people. Gradually colonialism spread entire territory like a cancer by the Berlin Conference in 1885 it was given a chance to European countries to rule the African continent. Thus, the African continent divided among European countries and Kenya was declared Protectorate of the British in 1895. The East African Coast was well known for slave trade but after abolition of slave trade to boost European economy the white settlers used local peoples as an economic resource. This national struggle spread various parts of Kenya. The colonialism hurt the sentiments of the indigenous people’s and this angriness taken severs shape through the revolution. Situation became worst when the colonial government took over all the belongings of the local people and forced their to work them. This had to liberation struggle, started because of exploitative behavior of the colonialism. To protect workers political and economic rights the trade union movement was taking place in Kenya, it was the first stage of liberation movement against colonialism. The movement became more aggressive after the world war II when people became conscious about their existences and their rights. Kenya has a mixed population of Europeans, Asians and Africans. The Africans, though the native of the country are the poorest of the three. They occupy the lowest economic and social status. They provide the unskilled labour which keeps the European's coffee, tea, and sisal plantations going. The white settlers provide lowest wages to labours and their living status very inhumane. The land was main reason Mau Mau revolution against colonialism; it was known as nationalist movement in Kenya and it’s led by the country’s

largest ethnic group Kikuyu. The movement with the joint coordination of people, led to Kenya's got independent in 1963.

**Keywords: Historical Background, Mau Mau revolution, Trade Union Movement and Independence.**

**0517242 CHOUDHARY, ABHISHEK (Jawaharlal Nehru University, New Delhi-110067). RESCUING THE DISCIPLINE OF INTERNATIONAL RELATIONS: LISTENING TO THE MARGINS**

The discipline of International Relations (IR) has hegemonic tendencies. The paper seeks to argue in favour of homegrown theorisation to counter such tendencies. The paper attempts at engaging with the processes that marginalise and silence certain alternate narratives in International Relations. Alternate narratives imply voices and perspectives other than the mainstream narratives articulated at a basic level by individuals and communities in society. In the discipline of IR, the move towards the sub-systemic level of understanding does not provide for a deeper ontological engagement with alternate perspectives. In this regard, it is asserted that by having a limited ontological stance, the discipline narrows its scope, applicability and reliability. This further facilitates the perpetuation and sustenance of exclusion by states. The paper questions the disciplinary scientification of IR that seeks to examine social realities as simple observable facts. Such a quest undermines multiple ways of social imagination. In this regard, a study of select marginalised communities within India presents a challenge to this over-simplified version of social reality. By examining alternate narratives, the study seeks to challenge the politics of knowledge production. It seeks to dismantle the tendency of hegemonic homogenisation thereby trying to rescue the discipline from its own fallacies.

The paper focuses on alternate narratives of select marginalised caste groups in India that are excluded from the dominant narrative. Theoretically, the paper is rooted in a critical-theoretical understanding and privileges the idea of emancipation. It considers emancipation at the core of any potential theorizing. However, it seeks to redefine the idea of emancipation specific to caste-based minorities in India. It also questions strict separation of levels of analysis arguing in favour of combining the levels. Methodologically, the paper seeks to provide a referential homegrown theory by focussing on the narratives at the margins of the social order. It uses the writings of Dr B. R. Ambedkar and Periyar E. V. Ramasamy alongside the untold stories from the margins to excavate a possible homegrown theory of IR.

**0517243 DEKA, BHASKAR JYOTI (Centre for International Politics, Organisation and Disarmament, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). RELATIONSHIP BETWEEN WATER AND WOMEN IN INDIA: RIGHTS REALISATION AND WATER SECURITY IN THE NEOLIBERAL AGE**

Access to water across all genders are not equal in India. Not only water creates history but also encourages exclusions and 'gender subordination'. Women, in India, have traditionally been made responsible for fetching water for the family but alienated from realising water rights citing the patrilocal norms. The lack of formal water right and exclusion from the social institutions, the concerns over water security of women becomes unimaginable, especially in the age of rising neoliberalism in India. This paper discusses the discourses of water as a right recognised at the international and domestic levels. Secondly, it investigates how the existing social structure in India is prejudicial in the materialisation of water rights and security. Thirdly, it analyses how the advocacy for neo-liberalisation of water governance becomes a curse on Indian women. In conclusion, the paper aims to theoretically understand the pollination of water rights, women, and neo-liberalisation, which is a research gap in the existing literature. In conclusion, it argues that the role of the state must be rekindled to ensure water security to Indian women in the neoliberal era.

**Key Words: Water, women, rights realisation, water security, India, neo-liberal age.**

**0517244 DUBEY, RAMAKANT (Department of Defence and Strategic Studies, Maharana Pratap PG College, Jungle Dhoosar, Gorakhpur). INDIA'S SURGE FOR INDIGENOUS DEFENCE TECHNOLOGY**

**0517245 GUHA, SANKALPA (Department of Anthropology, University of Madras, Taramani Campus, Chennai). A STUDY ON THE IMPORTANCE OF STRATEGIC PLANNING IN PROTECTING A NATION AND ITS PEOPLE**

When Charles Darwin described that 'It is not the strongest or the most intelligent who will survive but those who can best manage change.' as the basis of biological evolution, only a few might have pondered on its universal relevance. Analogous to the Theory of Evolution, strategic thinking is the art of analysing the available resources and situations and working around them to turn the consequences advantageous to self. While strategic planning can be seen as a personal trait, this article aims to carve out its importance in a nation's ability to preserve its entity.

Time has seen a fair share of great rulers who have successfully conquered vast expanse of lands and oceans not by mere ambition and military strength but with careful strategic thinking and execution. The world has also seen the collapse of enormous empires due of lack of tactical planning.

This article tries to study the consequences of strategic thinking or lack thereof which have led to the rise and downfall of several nations around the world in varied time frames. It will also try to draw a conclusion on how different countries have distinct strategic cultures on the basis of their geography, cultural orientation, historical prejudice, myths and legends, economy and the impact of war and sustenance.

In the times where the international community consists of capitalist, socialist and communist regimes including several small monarchies, it becomes imperative that a country is able to safeguard its interests all the while being able to maintain a friendly relationship with the neighbouring realms.

**0517246 JAGANATHAN, MADHAN MOHAN (Centre for International Politics, Organisation and Disarmament, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). RECASTING INTERNATIONAL RELATIONS: ENVISAGING EMANCIPATION AND ENVISIONING INCLUSION**

International Relations, in its predominant mainstream version and orthodox formulation, has been eminently exclusionary. In theory and practice, the hierarchical nature of the discipline is conspicuous. Theoretical perspectives perennially harp on about the anarchic character of the international system and the heightened insecurity therein for the sovereign states. The inference drawn is often unimaginative; a state caught in the grip of fear and trapped in a self-regarding rationale does not have the luxury to trust the other. The result is an unending distrust and a perpetual discord. With the exception of rational choice or game theory, other mainstream theoretical perspectives are not very different from the aforementioned gloomy realist prognosis. Realists may argue in their defence that states with relatively higher capabilities may be able to manoeuvre their way in the international system. However, this is no solace from the stultifying strategic logic. International Relations needs to be extricated from a boring analysis of anarchy and self-help and from a vicious circle of hierarchy, inequality and exclusion. The paper grapples with the puzzle: why is International Relations, which is avowedly for the entire world, partial in its analyses, selective in its focus and exclusionary in its embrace? What does it hold for the states with fewer capabilities and for those people who continue to suffer across states along the lines of class, caste, gender, religion, region and ethnicity? The genocide in Rwanda in 1994 is tragic not only for the death of approximately 500,000 – 800,000 people but also for the shocking indifference of the international community. In its quest to unpack the contours of mainstream International Relations, the paper makes a case for a normative turn in favour of emancipation and inclusion. The conceptualisation of emancipation has traversed quite a bit of theoretical terrain: from the liberation of the 'proletariat' in Marxism to the 'species' of Frankfurt School inspired Critical International Relations propounded by Andrew Linklater and to that of 'security' in the works of Ken Booth. The paper, while being continually enlightened by these insights, touches upon the life and works of thinkers such as Mohandas

Karamchand Gandhi, B.R. Ambedkar and E.V.Ramasamy. The idea is to tease out the various perspectives on emancipation embedded therein. In doing so, the paper aims at envisaging the notion of emancipation thereby making an attempt to envision inclusive International Relations. Currently, the vast sections of the global society especially those from the marginalised remain excluded. The exclusion is normalised owing to an uncritical acceptance of hierarchy and inequality. The paper hopes to stop the rot by pursuing a scientific method of analysis, which is consistent with critical-theoretical leanings. It is suggested that a conversation between critical theory and scientific method may yield useful inferences notwithstanding a clichéd dogmatic resistance to the pursuit of such an endeavour.

**0517247 KALYANI, SRUTHI A. (Student of International Relations and Area Studies, Jawaharlal Nehru University, New Delhi-110067). OUR WALLS IN THE CLOUD: DATA LOCALISATION LAWS, DIGITAL NATIONALISM, AND THE FUTURE OF LIBERAL WORLD ORDER**

The participatory turns of impersonal digital forces as a causal variable in geopolitical power politics is often overlooked in International Relations theory. The 2013 Snowden surveillance disclosures necessitated the urgency of debating the issue of big data in international affairs. Since then, an increasing number of nation-states have been formulating data localisation laws to counter the hegemonic practices of cyber superpowers in controlling the logical and physical boundaries of cloud storage systems.

Territorialisation of the digital space challenges liberal internationalism by disrupting democratic ethos and rule-based institutional order. At the justifying end of digital protectionism such as these data localisation laws is the claim of data sovereignty. When data sovereignty manifests in extreme as state-motivated digital nationalism, democratic elements of internet freedom and privacy are potentially destabilized. The entire realm of knowledge (re)production is in the peril of being set to the inclined tunes of the powers that own the cyberspace.

If breaking walls can solve the collective dilemmas of intelligence gaps, online radicalization, and propaganda crimes, what, then, governs and guarantees digital security in a dismantled and borderless cyberspace? How are the liberal institutions addressing the existing issues of power asymmetries, disruptive roles of private actors, and monitoring the state capacities to materialise the new localisation mandates? Are regional dialogues accommodated into the rule-based order? This paper is an attempt to answer these pertinent questions by studying episodes of digital protectionism amidst the parallel times of spiking nationalism and digital interdependencies among nation-states.

**0517248 KUMAR, JEETENDRA (Shaheed Bhagat Singh (Eve) College). UNITED NATIONS RESPONSE TO NATURAL DISASTERS: EVOLVING NORMS CREATION AND INSTITUTIONAL MECHANISMS**

Natural disasters have seen a persistent increase in the recent decades; have claimed lives of about 249,896 people worldwide in 2004 in 360 reported disasters compared to 84,570 killed in 1995 in 239 reported disasters, implying that the frequency and effects of disasters are increasing at an alarming rate. From a cumulative calculation, there were US\$ 75.5 billion economic losses in 1960s from natural disasters that have skyrocketed to US\$ 660 billion approximately in 1990s. Several reports including the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) released in 2004 and the 2030 Agenda for Sustainable Development recognizes and reaffirms the urgent need to reduce the risk of disasters.

The United Nations as a global organization based on the liberal conceptions aims at the best way of constructing a peaceful and prosperous global order. Establishment of norms of global governance around particular issue like arms control or environmental Concerns has been its significant contribution. The UN Charter in Article 1.3 entrusted the United Nations “to achieve international cooperation in solving international problems of ...humanitarian character...” Given this background, the present paper makes an attempt to map norms creation and the institutional mechanism under the rubric of the UN system with relations to its response to natural disasters. It is an area which is understudied when compared to complex emergencies with reference to the United Nations as an actor, as a platform or as a norm Creator. The paper would highlight various institutional and policy level

developments and changes across UN System to respond natural disasters. It traces establishment, mandate and working of Office of the UN Disaster Relief Coordinator (UNDRO) and existing UN office for Coordination of Humanitarian Affairs (UNOCHA) to coordinate natural disasters and UN agencies. It would evaluate various challenges attached to it.

**Keyword: United Nations, Natural Disaster, Institutionalisation, Tsunami**

**0517249 KUMAR, KURI SRAVAN (East Asian Studies, University of Delhi, Delhi). INDIA'S NON-ALIGNMENT BEFORE NAM: A CASE STUDY OF INDIA'S INVOLVEMENT IN KOREA FROM 1945-1954**

India's role in the Korea peninsula is unforgettable, but it was forgotten with the passage of time and got lost somewhere in the history. The First Prime Minister of India, Jawaharlal Nehru, believed on Pan-Asianism. He considered that India could play an important mediatory role in the world order, using its Commonwealth and Arab-Asian group connections to balance the bi-polar world. The Korean crisis was raised and it was turned into a perfect testing ground for Nehru's belief. Nehru saw an opportunity to mediate between the two blocs to find a solution that would bring peace to Korea and the world and an end to the Korean War. India started its role from 1947 to 1954 as chairman of United Nations Temporary Commission on Korea (UNTCOK) and United Nations Commission on Korea (UNCOK) and contributed in Korean War by sending 60th Parachute Field Ambulance (PFA). After Armistice Agreement Neutral Nations Repatriation Commission (NNRC) was established and it was chaired by India and Indian Custodian Force (ICF) was established by India to supervise POWs. India's diplomats had played an important role in aftermath of the Korean crisis by their active participation in drafting resolution at International platforms. The 60th PFA's role based on humanity and its works were unprecedented. India chaired the NNRC and its role is uncompromising and very crucial for POWs and it brings South Korea-India a step closer as in cultural exchange and friendships. India's first Foreign policy started from Korean critical juncture, as a Third World country leader under Non-Aligned Movement (NAM) policies. Some thing of Non-alignment is failed in Korea peninsula, one has to recognize that Communism and Capitalism both were too defeated in the Korean peninsula, which reflects on Korean War as nobody won or lost. The Korean War halted by the signing of armistice agreement and not a peace treaty; it's a temporary cessation of hostility itself which reflects that all 'ISMs' have failed in the peninsula. India's role was not truly recognised by Korea yet the Koreans who have experienced the humanitarian work of India, they have still shown their gratitude towards India in various events.

Why was India's Foreign policy a concern on Korea during Korean Crisis? Is it because of domestic politics or international politics? Did Indian public have any concern in Korea? How did India's multifarious roles influence the Korean crisis? My attempt is to discuss India's role in the Korea, especially during its most difficult period of Korean history and beginning of modern India. This is an endeavour towards the revival of a very crucial relationship of India-Korea which was forgotten.

**0517250 MAJUMDAR, MUNMUN AND SHIMRAY, RINREICHON H (Department of Political Science, North-Eastern Hill University, Shillong). SIGNIFICANCE OF INDIA'S ANDAMAN AND NICOBAR ISLANDS IN INDIA'S ACT EAST POLICY**

Located at the juncture of the Bay of Bengal and the Andaman Sea, a group of 572 islands (of which only 37 are inhabited)—the Andaman and Nicobar Island chain—straddles the busiest trade routes in the world, spanning 450 nautical miles and sits strategically at the entrance of the Malacca Straits. Although administered by India, these islands have greater proximity to Myanmar, Indonesia and Thailand—than to the Indian mainland.

The ANI extends into the vital sea-lanes connecting Japan and the Middle East through which much of the world trade passes. The proximity of the islands to major trade centres like Singapore can be utilized. About a third of India's Exclusive Economic Zone lies around the Andaman and Nicobar Islands, providing tremendous economic potential for tourism, fisheries, forests and hydrocarbon. With increasing Chinese naval presence in the Indian Ocean Region (IOR), New Delhi has begun to acknowledge the strategic geopolitical significance of the islands with regard to surveillance of crucial Sea Lines of Communication (SLOC) and how these islands could also form the

cornerstone for India's Act East policy. Despite their obvious geostrategic significance, New Delhi has not done much to develop the islands as a viable security and economic asset – until lately. This paper will therefore examine how India has been transforming the archipelago to tap the security and economic potential of the islands in playing out its Act East policy.

**Key: Act East Policy, Andaman and Nicobar Islands, China, India, Look East Policy.**

**0517251 NANIWADEKAR, MADHURA (CIPOD, School of International Studies, Jawaharlal Nehru University, New Delhi). WHO WILL WATCH THE WATCHMEN? SEXUAL EXPLOITATION AND ABUSE BY UN PEACEKEEPERS AND LACK OF ACCOUNTABILITY**

The UN is perhaps as close as the world will ever come to establishing a world government, and while it does not have the authority to take any decisions without approval of its member states, it is still an extremely important international player when it comes to matters of peace and conflict. The UN's peacekeeping process, one of the most visible expressions of the UN's commitment to peace, has undergone massive transformation over the decades to meet contemporary requirements. However, the UN's Peacekeeping Forces have faced controversies for a myriad of reasons, of which the most concerning perhaps are the seemingly never ending allegation of human rights violations by the peacekeeping forces themselves. The very fact that those who have been entrusted by the international community to put an end to conflict and protect vulnerable populations are themselves engaging in immoral and illegal behaviour is a serious blow to the legitimacy of these peacekeeping operations. Most of these allegations have been about sexual abuse and exploitation (SEA). These are not just isolated incidents, but rather on-going violations, especially in poorer countries. There have been multiple reports of UN workers and other humanitarian aid workers 'exchanging' food and other basic necessities like flour, oil, etc. for sex. Despite the well-publicised nature of these crimes, the UN, having allegedly known about it about 10 years before they came to light, has not done enough to keep its peacekeepers in check. Categorisation within the peacekeepers depending on the nature of their work (military or civil) directly affects the kind of immunity they have. The issue has been addressed several times by top UN officials, including the Secretary General. The Zeid Report discussed in detail these violations and the immediate need for reform. Despite this, both the UN and the troop contributing states have been hesitant to prosecute those who've been named. The UN, by its very nature, is constrained when it comes to dealing with such matters and the most it can do in most cases is to send back the personnel and ask states to take action. Unfortunately, states rarely punish their own. The complicated nature of sexual abuse makes it difficult to ascertain whether it really is abuse, and it is even more difficult to get victims to speak out. Several scholars have pointed out how entire economic systems emerge due to the mere presence of peacekeeping troops and there is a rise in demand for certain illegal services, of which prostitution is well known. The aim of the paper will be to look into the nature and perhaps the patterns of these allegations of sexual abuse and exploitation, as well as the complexities involved in prosecuting those who are held guilty. We will also look at the nature of international law in this regard, and the response by both the UN and the states- in terms of norms and standard setting as well as accountability (or lack of), and if this has had any real impact. Finally, we will look at how this has a direct impact on the legitimacy of the whole UN peacekeeping process.

**0517252 RANJAN, RAJEEV KUMAR (Department of Political Science , Aryabhata College, Univeristy of Delhi, New Delhi). PROTECTED BY THE LAWS BUT REJECTED BY THE CULTURE: STIGMATIZATION OF WOMEN AND PEOPLE FROM LGBTQ COMMUNITY LIVING WITH HIV/AIDS**

According to latest UNAIDS estimate (2019 report) 37900000 (32700000 – 44000000) people belonging to all age groups are suffering from HIV/AIDS. The trend is on the rise. The prevalence rate is also on the rise i.e., 0.8 per cent. Out of that 18800000 women and 17400000 are men belong to 15 years and above. The number of children belonging to (0-14) age group is estimated to be 1700000. The trend shows the number is decreasing. In India, according to 2017 NACO report, more than two million people are living with HIV/AIDS. The prevalence rate is .22 per cent. Out of that 42 per cent belong to women population. The number of AIDS related deaths has come down from 1700000 in 2004 to 770000 in 2018. All these figures seem to be encouraging in terms of efforts taken by UNAIDS with different national AIDS agencies working for HIV/AIDS prevention and control.

However, stigma and discrimination against people living with HIV/AIDS is telling a different story despite initiatives taken by International agencies and different governments. In this regard in India two important events took place in the year 2017 and 2018. In 2017 government of India passed HIV/AIDS prevention and Control Act which concerns with the legal safety and safeguards of people living with HIV/AIDS and people associated with them and in 2018 the Supreme Court of India passed a judgment which decriminalizes LGBTQ activities under right to privacy. The HIV/AIDS prevention and Control Act was long pending demand adopted by the United Nations in 2001 in its Special Session with regard to HIV/AIDS patients and Article 2 and Article 3 of International Covenant on Civil and Political Rights adopted in 1966 and came into force in 1976 which talks about Each State Party to the present Covenant undertakes to respect and to ensure to all individuals within its territory and subject to its jurisdiction the rights recognized in the present Covenant, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.

All talking here about the targeted population strategized by the UNAIDS to prevent HIV/AIDS transmission from this section of population to mainstream population, however major hurdle in this regards so far has been the absence of clear cut laws and guidelines which actually resulted into large scale discrimination and stigma practiced by government agencies in particular and society in general. People living with HIV/AIDS are discriminated on the grounds of being diseased, but LGBTQ community are discriminated and ostracized on the basis of their sexual orientation. The other significant section of society is women. Women HIV/AIDS patient are suffering from multiple discrimination and stigma.

This paper seeks to investigate the cultural construction of stigma, dehumanizing practices, cruel and inhuman treatment meted out to people living with HIV/AIDS especially women, injecting drug users and LGBTQ. It further investigates the effect of the laws and court judgments vis-à-vis human rights perspective at national and international to alleviate the fear of people living with HIV/AIDS.

**Key words: HIV/AIDS, stigma, ICCPR, HIV/AIDS Act, Article 377, UDHR, UNAIDS Report, NACO, WHO, Human Rights Watch**

**0517253 SADIQE, SHIFA (Jawaharlal Nehru University, New Delhi-110067). THE REPRESENTATION OF STEREOTYPING IN WAR FILMS GENRE: A CASE STUDY OF VIETNAM WAR FILMS**

Images shape our understanding of the world to a large extent. In this century, movies are an integral part and potential to shape the perspectives of people. For example, the role played by movies in creating a 'western obsession' is undeniable. The films have immense power. It really reduces the psychological distances between people and helps to understand the customs and way of living. Like the folk tale, classic drama, primitive storytelling, or the medieval morality play, the film may be regarded as a means through which the individual understands himself, his social role, and the values of his group. It is also a means by which the individual orients himself in a universe of events which appear to occur haphazardly and chaotically. His need for meaningful experience is a need for order. This need has an emotional component since the lack of coherence in experience creates anxiety within the individual, from which he seeks relief. Any individual comes to know about the environment through remembering, thinking, perceiving, dynamic and creative rather than static and passive. Individuals respond to the situation not passively but by active thinking or cognition. The films have a role in helping individuals to cognize the world selectively and creatively. We can see a tendency to reduce the role of films as a mere tool of entertainment. But this attitude should be averted for an interdisciplinary approach that will lead to serious intellectual engagements. Even though every film has its own uniqueness and influence. But the particularity of war film is that it is not a mere surface-level reporting but to make the people conscious or being touched by war. War Film is a film genre concerned with warfare, typically about naval, air, or land battles, with combat scenes central to the drama. It has been strongly associated with the 20th century. The fateful nature of battle scenes means that war films often end with them. Themes explored include combat, survival and escape, the camaraderie between soldiers, sacrifice, the futility and inhumanity of battle, the effects of war on society, and the moral and human issues raised by war. Eg- Dunkirk, Saving Private Ryan, etc. The most popular topic of war films



revolves around the second world war. But there is no complete authority of the western narration. We can see other narrations, including China, Japan, etc. of their battles and combats. Even though there are critics on war films for portraying loose and unhistorical facts, but their impact cannot be sidelined. The recording and portrayal of war films is a collective memory. After so many generations, these films will serve as an ingress to the history.

A Research major focus is many generations the Vietnam war and its portrayal in films called, 'Girl from Hanoi' and 'Rescue Dawn'. The major reason choosing these films is to understand the difference in the portrayal of the Vietnam war. The former is the harrowing experience of a Vietnamese girl, whereas the latter is the suffering of an American soldier. So it would be interesting to study the stereotypical representation of the Vietnam war in both these films and how it influenced the people culturally. It will help to understand the Vietnamese perspective and American perspective.

In this article, the author has tried to focus on the representation of war films including the depiction of historical facts and its stereotypical implications. The purpose of this article is to show new technologies and innovations that help people to connect with the past. The approach to this article is interdisciplinary which revolves around Content Analysis using the facts of history and context of the films.

- (i) The importance of films in connecting past and present.
- (ii) The stereotypical elements in "Girl From Hanoi" and "Rescue Dawn" in understanding the Vietnam War.

This article is an original work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature.

**0517254 SANYAL, RIDDHI (Jawaharlal Nehru University, New Delhi-110067). AFRICAN UNION IN PEACEKEEPING: THE BURDEN-SHARING-BURDEN SHIFTING DYNAMICS**

The change in the nature of peacekeeping from traditional to multifunctional has been coupled with a simultaneous change in the nature of warfare from being inter-state to increasingly acquiring an intra-state character in recent times. Further, the proliferation in non-UN peace operations being conducted without the authorization of Security Council multiple times has led to the residence of authority and the monopoly of UN in the arena of keeping peace keeping to come under increasing scrutiny. Secretary- General Boutros Boutros Ghali's report named 'An Agenda of Peace' (1992) calls for regional organizations to be involved in activities of UN in regard to security and peace. The report highlights the necessity of using regional arrangements in mechanisms like peace-keeping, peace-building and preventive diplomacy. Between the periods of 1993-2005, discussions on issues of challenges to international peace and security and role of regional organizations has further led to the adoption of "A framework for Cooperation" calling for a pragmatic and flexible approach of UN to any regional crisis, mutual consultations and support in operational activities coupled with joint deployment of forces. Thus, a burden-sharing arrangement between the UN and regional organizations has been the focus.

The case of African Union's relationship with UN, is however, complex with its call for "African solutions to African problems." While the AU has come into the forefront in terms of "filling the gaps" of inaction in conflict-areas and assumed peace-keeping roles, its operationalization as conflict-manager faces challenges in terms of lack of possession of institutional, financial and military capacities. These factors have hindered effective action by AU leading to a tendency of appealing back to UN to take over the issues, taking up which is again subjected to the geo-political as well as the geo-strategic importance of the area by the major powers, often leading to a compromise in the principle of "regional impartiality" and delayed response.

The paper, in this context, delves into the question of whether the UN shifts the burden of regional peacekeeping to regional organizations and thereby, lags behind in assisting regional organizations (mostly financially and militarily) despite calls of burden sharing. Thus, it attempts to analyze the relationship between African Union and UN in terms of managing conflicts and dealing with peacekeeping and looks into the

operationalization of the power-dynamics within the regions in terms of decision-makings in regard to conduct of peacekeeping operations.

**0517255 SANYAL, RIDDHI (Jawaharlal Nehru University, New Delhi-110067). THE POLITICS OF KEEPING PEACE AND ITS PITFALLS : A COMPARATIVE ANALYSIS OF PKOs IN CONFLICT MANAGEMENT IN THE POST COLD WAR ERA**

The change in the nature of peacekeeping from traditional to multifunctional has been coupled with a simultaneous change in the nature of warfare from being inter-state to increasingly acquiring an intra-state character in recent times. Further, the proliferation in non-UN peace operations being conducted without the authorization of Security Council multiple times has led to the residence of authority and the monopoly of UN in the arena of keeping peace keeping to come under increasing scrutiny. The paper attempts to look into the nature of Peacekeeping and delves into understanding UN's effectiveness in terms of managing the intra-state conflicts in which ethnic groups, insurgency groups, governments and multiple actors acquire center-stage in regard to an issue area.

In certain cases like that of Darfur, it has been seen that regional organizations lack the capacity in terms of resources to deal with the complexity of issues in crisis areas. While the responsibility is taken by these organizations initially with the Global North issuing promises in terms of "burden sharing", a tendency of "burden shifting" is identified with these organizations lagging behind in handling issues and appealing to the UN to intervene, intervention by which is again subject to the geo-political as well as the geo-strategic importance of the area by the major powers. In this context, the paper focuses on a comparative analysis of three PKOs-

- United Nations- African Union Hybrid Operation in Darfur (UNAMID) - Looking into the complementarity-competition dynamics.
- United Nations Supervision Mission in Syria (UNSMIS) - Problematizing the question of withdrawal in the background of an ongoing civil war.
- UN Nations Assistance Mission for Rwanda (UNAMIR) – Looking into the Burden-sharing/ Burden-Shifting dynamics and the timeline of intervention.

Through the analysis, the paper seeks to look into the following Research Questions-

- Does the proliferation of peace operations by coalition of alliances and regional organizations challenge the UN or does these seek for legitimacy from UN for its actions i.e. complement rather than compete with UN?
- Do the peacekeeping forces operate till the end of conflicts with commitment and obligation and does the changing nature of politics in regions influence the decision-making in regard to withdrawal of Peacekeeping forces?
- What happens when Multi-functional Peacekeeping fails and what are the commonalities and differences in terms of the limitations faced by the forces as seen through the case studies?

Thus, the paper tries to bring out the various strategic and political factors that differently shape the conduct of stakeholders of peacekeeping from one region to another.

**0517256 SHARMA, PAWAN KUMAR (Department of Political Science, Rajasthan University, Jaipur). Hkkjr&l lkefjd laca/k % orZeku lanHkZ eas**

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varjkZ"V<sup>a</sup>h; foÜk laLFkkvksa vkfn eas nksukasa ds e/; leku n`f"Vdks.k ik;k tkrk gSA :lh rduhd vkSj fo'ks"kkksa dh enn ls Hkkjr us dbZ ihf<+;ksa dk varjky ,d >Vds eas ikj dj fy;k vkSj czäksl&vkdk'k tSlh felkbysa dk mRiknu djus eas l{ke gqvKA nksuksa ns'k ekuo jfgr Lisl foeku dks Hkustus esa vkilh lg;ksx ij Hkh fopkj dj jgs gSaA Hkkjr us bl ;k=k ls :l ds lkFk dwVuhfrd] lkefjd vkSj vkfFkZd fj'rs dks izxk<+ fd;k gS vkSj viuk oSf'od fgr lk/kk gSA

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#### **0517257 SHIBU, M.P (Department of Political Science, NSS College, Pandalam). UNDERSTANDING THE POLITICS OF SECURITY IN LIBERAL DEMOCRATIC STATES**

This paper basically seeks to understand the politics of security in terms of how the discourse of security is used by the liberal democratic states in national politics. For instance, winning elections on security agenda, creating a security environment where security is the primary issue that needs to be dealt with more urgent mechanism etc. These types of acts basically sideline humane issues affecting large sections of society. In classical Marxian analysis, economics is the base which is affecting all other relations; this dimension is replaced by 'politics of security' which has become the primary concern for people in selecting their governments. This is a transformation of state agenda. This form of behaviour can be identified in most of the liberal democratic states like India where surgical strikes, securitisation of certain places of 'contested states' and an increase in defence budget— where there is deficiency of social security measures – are seen. India as a post-colonial state with nationalist agenda has been trying to rebuild its unique culture over the years and its capitalist agenda is useful in seeking support from civil society agents like media, academia and industries; this has resulted in a 'security complex' in dealing with security issues. Mediated democracy often exaggerates the threats of terrorism and the strategy towards terrorism (counter-terrorism) is much more inhumane, securitised, fearful and undemocratic. Terrorism creates and exploits a climate of fear among a wider target population which is not a philosophy or a movement, but a method. Here the worldwide dissemination of technology has greatly enabled the growth of terrorism. Through media, terrorism has gained worldwide publicity and amplified the element of fear thereby propagating awareness of their cause and demands. The policy towards terrorism preferably could lay emphasis on reducing qualms and overreactions: this is missing in the policy agenda of liberal democratic states. In this context, this paper tries to understand the changing nature of liberal democratic states in pursuing the politics of security.

#### **0517258 SUNMBUL, AMNA (Oakridge International School, Bangalore). THE KNOWN AND UNKNOWN IN SECURITY NARRATIVES: A CRITICAL-THEORETICAL DISCOURSE**

Why do security issues create ripples and apprehensions in the society? The 'threat' emanates invariably from a source that is, following the typical threshold, powerless. The fear which is appropriated as genuine, regurgitates when confronted with ground realities. Herein, there seems to be a complex relation between the narrative forestalled and the actual situation. Security studies, thus far, has mostly focused on the dominant narratives which circulate the anxiety in the society through news, agendas and awareness campaigns. The question which is thought-provoking can be spelt as follows: what might explain the propagation of fear, given that the idea is to eradicate the same? This paper argues that there are two narratives, which are present for every security narrative. The first dimension is 'known'. This implies that there are qualitative and quantitative ways of analyzing the threat and goes with an underlying assumption that it can be controlled through stringent measures and regulations. This discourse is out there in the public discourse: it is understood, comprehended, acknowledged, challenged and often portrayed as manageable. The second dimension is that of the 'unknown'. This is a hidden narrative and lurks in the background. There is no obvious knowledge of the security issue that might arise. Yet the situation is a *fait accompli*. This paper attempts to understand why certain security narratives take precedence over others. Security studies as a discipline suffers from the lack of imagination of what might constitute the 'threat' and has therefore focused more on the tangible and foreseeable aspects of security. Revisiting some of the recent instances, it can be argued that the situation culminated into one of fear and awe because the core problems were sidelined. In the current times, security must be studied from the perspective of establishing the lesser known narrative. This 'unknown' narrative has a variety because the concerns of the marginalized in the society are not one

and the same. Addressing the ‘unknown’ in security narratives, the paper proposes, can bring about discourse ethics. For this reason, a deviation is needed from the quantitative analysis. The method of reading and deconstructing the popular or ‘known’ narrative can bring diverse perspectives to the fore.

**0517259 WAMORKAR, ARUNDHATI (Department of Defence & Strategic Studies, University of Madras, Chennai). REVIVING QUAD AND ITS FUTURE MARITIME SECURITY COOPERATION IN THE INDO-PACIFIC**

This paper examines revival of Quadrilateral Security Dialogue (known as ‘Quad’) in 2017 by the four member countries- Australia, Japan, India and the United States and its future maritime security cooperation in the Indo-Pacific. The paper argues that the Quad could act as a platform to balance the developing situation in the Indo-Pacific, because of its collective military and strategic capabilities. It is difficult to determine the geopolitical profile of the region because apart from being economically tangled and interdependent, the region is troubled due to traditional rivalries, status quo, non traditional security threats, environmental degradation and emerging differences in the existing regional organisations. While the member countries have concerns with China, there are striking differences in their approach to these concerns. As the Quad enjoy bilateral, trilateral relationships and military exercises with each other, it will be important to find a point of convergence among the four and also, to determine whether the future policies in the maritime domain will be China centric or more than that. This paper also discusses, to what extent the Quad members are willing to engage in such undertaking considering their own national interests and potential of maritime domain to bring convergence of interests of the four Quad members and their shared security concerns to address the various security risks of the future.

**Key words: Quad, Maritime Security, Indo-Pacific.**

**0518260 ABHYANKAR, KALYANI (National University of Advanced Legal Studies, Nas Road, HMT Colony, North, Kalamassary, Kochi, Kerala). CONSUMER RIGHTS - CONSTITUTIONAL AND HUMAN RIGHTS PERSPECTIVE**

We see our customers as invited guests to a party, and we are the hosts, it's our Job every day to make every important aspect of the customer experience a little bit better.

The term "consumer" gained widespread recognition in 1962 when John F Kennedy mentioned the importance of consumer for an economy in his speech to United State Congress in 1962. The term 'consumer' has not been defined universally as the concept of consumer changes according to varying circumstances. The Black's Law dictionary defines "consumer" as a person who buys goods or services for personal, family, or household use, with no intention of resale; a natural person who uses products for personal rather than business purposes. The consumer himself has gone through transformation to a large extent in a short period of time and therefore the meaning of consumer has been subject to change from time to time and place to place. Consumers have continued to develop and evolve and therefore the market system has also changed in response to consumer behaviour.

The principle of "caveat emptor" was introduced in the olden days where seller and buyer entered into transactions in the open market system. Here, the seller would exhibit his goods, and consumer shall buy them only after proper examination. Consumers were expected to purchase the products using their reasonable skill and observation. The rule implied that no seller shall be liable for any defect in the product. Eventually, there was an increase in trade and commerce, which led to the introduction of a variety of goods and services in the market, and rule lost its importance gradually. In the modern age, economies developed, which led to the establishment of new dealings between sellers and consumers through e-commerce industry, and it became more important to maintain the sanctity of the relationship between them.

Consumerism is the protection of interest of the consumers. Mahatma Gandhi had said "A Consumer is the most important visitor on our premises. He is not dependent on us we are on him. He is not an interruption to our work; he is the purpose of it. We are not doing a favour to a consumer by giving him an opportunity. He is doing us a favour by giving an opportunity to serve him." Despite such views, consumer awareness is still in its infancy stage and consumerism as a social movement has not been able to make its mark as it could have in the society. Consumerism is a very recent phenomenon which aims to protect the consumers by government through its rules and regulations and by NGO's that aim to make consumers aware about their rights and duties.

Right is a correlative to duty according to Hohfield Analysis and it has been defined by many jurists since time immemorial. The definition which is widely accepted of right is "something that is due to a person by a just claim, legal guarantee, or moral principle".

The concept of right cannot be explained in particular but it may be understood as something which a man has entitlement to naturally for virtue of being a human or has been guaranteed by the state through its constitution or statute. Consumers are accorded various rights across the countries. John F Kennedy in his famous speech in 1962 suggested four rights on which consumer protection law should be formulated. The Consumer International drafted consumer rights which have been accepted by most economies in their statutes.

**0518261 CHADDA, VIDHI MADAN (Vivekananda Institute of Professional Studies, Guru Gobind Singh Indraprastha University, Delhi). THE MUDDLED PITCH: WAY FORWARD FOR THE REGULATION OF CRICKET IN INDIA**

With ardent and myriad fan- following, undoubtedly, cricket is treated as a religion in India. The game enjoys the unsaid status of a national sport in the country. The popularity and wealth in cricket has increased exponentially due to the initiation of Indian Premiere League (IPL). However, the said glory has come with a cost. Since the introduction of the IPL, the cricketing sport has been mired in one controversy or another.

Board of Control for Cricket in India (BCCI) is the administrator for cricket in India. BCCI has been disparaged for its inability to curb practices marring the sport viz. match/spot fixing, betting etc., lack of transparency in its rules governing the sport, ineffective grievance redressal mechanism and continued indifference towards wrong-doings and wrong-doers. The Supreme Court of India has reiterated that the BCCI discharges public functions and the “cloud over the working of the BCCI” has leaves crickets’ ardent followers “worried and deeply suspicious about what goes on in the name of the game”. The Apex Court indicated that the way forward for a sport which is not only a passion but a great unifying force, by adopting a “zero tolerance approach”, which can alone satisfy the cry for cleansing and directed for the constitution of a committee for suggesting reforms. The Committee recommendations ensures checks and balances on the working of the BCCI and also induces transparency into the system of regulation of cricket in the country.

The paper critically appraises the Lodha Committee recommendations in the light of its worthiness for the administration of cricket in India. The paper further examines the position post the Lodha Committee Report. It concludes by suggesting measures for application of the said recommendations for betterment of cricket administration in the country.

**Keywords: Board of Control for Cricket in India, Lodha Committee Recommendations, administration of Cricket.**

**0518262 GUPTA, GAURI (Vivekananda Institute of Professional Studies). DISPUTE RESOLUTION MECHANISM IN MODEL INDIAN BILATERAL INVESTMENT TREATY 2015 – ONE STEP FORWARD, TWO STEPS BACKWARD?**

India has emerged as a formidable economic and political force in recent times. As per the UNCTAD world investment report (2018) India was among the top 10 FDI host economies in 2017 and 2018. States enter into Bilateral Investment Treaties (BITs) to promote FDI. BITs contains norms regulating sovereign conduct relating to FDI and dispute resolution mechanism to resolve claims arising because of violation of these norms. Negotiation of these BITs are often based on the contracting states’ model BIT. Investor state dispute settlement (ISDS) is a regular feature of BITs and enables foreign investors to sue a host country directly in front of trans-national tribunal. Initially Model Bilateral Investment Promotion and Protection Agreement (BIPA) 1993 and later Model BIPA 2003 were used by India for negotiating BITs. However increased used of ISDS to challenge various regulatory measures by host nations on one hand and huge monetary compensation being awarded to foreign investors and host nations being forced to pay such huge compensation on the other hand forced several states such as Brazil, South Africa, India among other states to revise their BIT programme.

India’s first encounter with ISDS was in 2011 in White Industries case. The claim was based on India-Australia BIT signed in 1999. This claim was followed by several other arbitration notices against India such as notice by Vodafone under India-Netherland BIT, Deutsche Telekom issued notice under India – Germany BIT, By Cell slapped notice against India under India-Cyprus BIT however the list doesn’t end here. Consequently India decided not only to terminate the existing BITs with 58 countries but also to review the model BIT 2003 and published a new model BIT in 2015. Moreover, it is in the process to align its ongoing BITs with model BIT 2015. India Model BIT 2015 retains ISDS with certain riders. Model BIT 2015 provides for qualified ISDS. Foreign investors are required to exhaust local remedies for a period of five years before commencing international arbitration.

The paper aims at critically analysing ISDS provisions provided in the new model BIT 2015. The paper also looks into the practices followed by other top FDI host nation such as Brazil and China in their approach to ISDS.

**0518263 SUDESH, V. AND KAVYA, M. (Faculty of Law, University Law College and Department of Studies in Law, Bangalore University, Bengaluru). JURISPRUDENCE ON RESOLUTION OF RIVER WATER DISPUTES IN INDIA: AN OVERVIEW**

River water disputes are as old as rivers themselves; it is essential to study the historical conditions that prevailed in the past. By studying the previous laws and by knowing the past experiences and cases concerning inter-state river water disputes, one will understand the customs and regulations that prevailed in the past in governing the river water resources, proprietary rights over river waters, rights of riparian states and the necessary mechanisms adopted for settlement of the inter-State dispute. Administration of river water resources can be seen in different periods, from the ancient period to the British era. When India was under British rule a serious attempt was made in India to solve river water sharing problems between different provinces. The legislation in this field existed in the pre-independence era. The Government of India Act 1919, where irrigation was a provincial subject, but the issues relating to different provinces were under the central legislature. During that time the disputes between different provinces in the country were solved by the instructions of the Secretary of the state by conversations through common concurrence.

Through the enactment of the Government of India Act, 1935, the federal setup was developed in India. For the first time, water laws were centrally codified under Chapter VI of the Government of India Act, 1935, under the heading “Administrative Relations between Federation, Provinces, and States.” The Act for the first time provided for settlement of water disputes under Sections 130 to 135 of the Act, read with Schedule VII, List II and Entry 19 of the Provincial Legislative List. Entry 19 covers all the aspects regarding water and its uses which are brought under the umbrella of provinces. An analogous mechanism to resolve inter-state river water disputes and complaints was assumed by Articles 239 to 242 of the draft Constitution, but all these provisions were departed, with a single inclusion of Article 242A, which reproduced as Article 262 of Indian Constitution. Nevertheless, Articles 239 to 242 of the draft constitution have emerged as provisions of the Inter-state river water disputes Act, 1956. In this article, the author attempts to explain the legal conditions that prevailed during the British period to solve river water sharing problems between different provinces. Further, the author tries to create nexus between the Pre-independent legislations concerning river water disputes with draft Constitutional provisions and post-independent Constitutional provisions and legislations.

**0518264 KUNDAL, NAVJEET SIDHU (Vivekananda School of Law and Legal Studies, VIPS, GGSIP, University, Delhi). STATELESS IN ONE’S OWN LAND: A CURIOUS CASE OF NATIONAL REGISTER OF CITIZENS**

Even after more than half a century the issue of illegal migration remains an explosive and unresolved issue in India. On August 31<sup>st</sup> 2019 after a long drawn process the final version of the National Register of citizens was published. Around 6% of the population of Assam was kept out of the list pushing them to the brink of statelessness. The discrimination evident in the NRC process is clearly against all national and international standards of non-discrimination. The lack of adequate procedural safeguards and arbitrariness of the process has been a matter of considerable concern. Further the people who are kept out of the list are at an undeniable risk of imminent statelessness with a very narrow window to appeal against the list. The absence of a specific plan with the government on the settlement of those not making it to the list has also caused widespread fear and sense of insecurity amongst the affected families and individuals. This has destabilised people and undermined their progress.

Arbitrary deprivation of citizenship is not only a violation of fundamental human rights but is also against all principles of International Law. The paper is an attempt to take a critical look at the self-made crisis in India along with the resultant disenfranchisement. The paper will particularly focus on the judicial trends towards statelessness and the role of Supreme Court of India in the entire process. Finally, a more humane and inclusive solution to the problem will be looked into with specific reference to the International Standards for the Protection and Identification of Migrants and Refugees and The Global Compact on Refugees.

**0518265 PATIL, ANITA (National Law School of India University, Bengaluru). EMPIRICAL STUDY ON MISLEADING ADVERTISEMENTS, CONSUMER AWARENESS ON LEGAL & REGULATORY MECHANISM IN INDIA WITH SPECIAL REFERENCE TO FOOD, DRUGS AND COSMETICS**

After Liberalisation, Privatisation and Globalisation, advertisements have played a vital role in the era of competition and technology in India. No doubt as long as the competition in the market is healthy it can be accepted but the problem arises when misleading tactics are used which in fact has an adverse effect on the consumers. Advertisement creates a huge urge in the people to purchase any things which they initially do not want to buy thus having a strong psychological impact on consumers. Another important question is whether advertisement is a boon or a curse. There are always two sides of the coin. On one hand advertisement is vital for economic growth but it should not be allowed if its misleading in nature. There is no doubt that Article 19(1) (a) of the Indian Constitution ensures Right to freedom of speech and expression but it is not an absolute right. Misleading advertising has been prevalent in the country for a long time. Misleading advertisements are rampant in today's India and are getting more frequent. It is very important to make sure that these kinds of advertisements do not continue. Consumer Protection Act, 2019 (CPA,2019) has been passed by the parliament and has received the president assent on 7<sup>th</sup> August, 2019. The New Act of 2019 will come into force on such date as the Central Government may so notify. The New Act seeks to replace the more than three decades old Consumer Protection Act, 1986. The major aim of the 2019 enactment is to protect the interest of consumers, establishment of regulator mechanism such as Central Consumer Protection Authority, redressal mechanisms to settle consumer disputes specifically regulating product liability and misleading advertisements. These majorly changes were not seen in the old Act i.e. Consumer Protection Act, 1986. The new Act of 2019 has also introduced majorly three new Chapters such as Central Consumer Protection Authority in Chapter III, Mediation Cell in Chapter V and Product Liability in Chapter VI.

This paper will focus on an empirical study conducted before 7<sup>th</sup> August 2019 i.e. before CPA Act, 2019 was passed to know about the status of Misleading Advertisements, Consumer Awareness on Legal & Regulatory Mechanism in India with special reference to Food, Drugs and Cosmetics.

**0518266 PATIL, ASHOK R (National Law school of India University, Bangalore). CONSUMER PROTECTION IN ELECTRONIC COMMERCE SECTOR**

India got independence in 1947 from British crown rule and the Constitution of India came into effect on 26 January 1950. India is the seventh-largest country by area, the second-most populous country with over 1.2 billion people and the most populous democracy in the world. India is a federation with a parliamentary system governed under the Constitution of India, which serves as the country's supreme legal document. In India, the need for consumer protection is paramount in view of the ever-increasing population and the consequent need for many goods and services of which is no matching supply.

The British rule revolutionized the Indian legal system by bringing about unified nationwide modern legal system. Some of the legislations that were passed during the British regime to protect consumer interests are – the Indian Contract Act, 1872, Sale of Goods Act, 1930, Indian Penal Code, 1860, Drugs and Cosmetics Act, 1940, Agriculture Procedure (Grading and Marketing Act), 1937. Other than Constitution of India, several legislations were enacted post-independence such as Competition Act, 2002, Food Safety and Standards Act, 2006, Legal Metrology Act, 2009, the Bureau of Indian Standards, 2016, Information Technology Act, 2000 and Consumer Protection Act, 1986 to protect the consumers.

It is the State's duty to guarantee the right to live with human dignity, free from exploitation, of everyone living in it. This right to live with human dignity is enshrined in the Indian Constitution and derives its life's breath from the directive principles of state policy. According to article 38 of the *Indian Constitution*, the State shall secure a social order for the promotion of the people's welfare and shall effectively work to achieve a "social order in which justice, economic and political, shall inform all the institutions of the national life." In addition, the State has a duty to raise the level of nutrition and the standard of living to improve public health, and to prohibit consumption of intoxicating drinks or drugs which are injurious to health.

Due to globalisation and development of technology, Electronic Commerce (E-Commerce) has become a bustling business in India today. It is the cutting edge in all areas of business today. Therefore, physical market shifting to Electronic market in India. E-Commerce has evolved and has gained importance in the present economy. E-commerce offers the consumers a wide range of products and services and also, the businesses find huge potential



for consumers. Also, the number of internet users has gone up in the world including India. As a result, the number of e-commerce transactions has increased manifold. A large number of new businesses and services have also evolved around the world and the concept of B2C commerce has also expanded especially inter-state and cross border transactions.

E-commerce has indeed emerged as a major opportunity for India. With the phenomenal spread of mobile telephony and the advent of 4G in the country, buyers from small towns and cities are also buying online in large numbers. It is a fact that internet has dissolved the discrimination factor between the small and the big cities enabling buyers from small towns to have access to the same branded goods, and quality products which earlier was a privilege of large city buyers.

Consumer confidence primarily involves two convictions – that the consumer will get what he expects and that if things go wrong, the consumer can seek a remedy. The virtual aspect of e-commerce sale throws up newer confronts to consumer trust and confidence. The Consumer Protection law recognises several unfair trade practices such as false and misleading representation of goods and services in terms of standard, quality, grade etc., materially misleading the public as regard the price at which the goods are ordinarily sold, disparaging of goods, misrepresentations as to warranty or guarantee etc. But, what about failure on the part of the business in providing adequate disclosure of information regarding the address of the supplier, characteristics of goods and services, delivery costs, withdrawal etc. in case of such distance selling?

With the increase in e-commerce transactions, the number of disputes are bound to increase. Therefore, effective measures/mechanism for resolving these disputes is necessary and should be given importance. The e-commerce should not slow down because there is no proper dispute resolution mechanism in place. This hurts the economy of the nation considering the potential it holds in the cross border sales.

An effective dispute mechanism should generally include speedy justice and convenience. Consumers including those who have small value claims should also have access to a forum. Consumers should be given an opportunity and access to assert their rights. This article analyses the present trends in consumer law in E-Commerce in India and the challenges faced in protecting the consumers in the virtual online space.

**0518267 RANGASWAMY, D (Karnataka State Law University, Navanagara, Hubballi, Karnataka). DNA PROFILING: ASSESSING ITS EFFICACY FOR CRIMINAL JUSTICE SYSTEM**

In the past few decades, major changes have begun across the globe to strengthen legal systems with emerging science and technologies and flourish human society accordingly. DNA profiling is one such innovative techniques adopted by the States across the globe to systematize their administration of justice system. It is believed that both criminal as well as civil justice system of the country could benefit from this technology. Rejuvenating the criminal justice system of the country – in its possible dimensions and approaches- is an essential step to constitute just, fair and equitable society to drain out criminal image of the society. It might serve as an important technological tool to pursue progressive goals of the nation. Notwithstanding, despite its parochial approach, Indian legal system has failed to infuse these technological outputs to the administration of justice system. Whereas, this technology-oriented investigation may pose basic question about interplay between inherent rights of the person subjected to such DNA profiling and law enforcement authorities. In this context, the paper examines accompanying ideology of the DNA profiling in the backdrop of its interplay between its importance for administration of criminal justice and human rights issues. The paper concludes by emphasizing upon the fact that DNA profiling should not be sidelined merely because of human rights issues of the person subjected such tests as the crime prevention and crime prosecution has noble objectives to achieve for society. However, system adopt DNA profiling by ensuring at most regard for procedural justice.

**Key Words: DNA, Criminal, Justice, Investigation, Courts, Human Rights**

**0518268 SANDHU, RAVNEET (.....). THE CONCEPT OF MINIMUM FLOW: INTERPRETING IT IN THE LIGHT OF THE CONFLICT BETWEEN CUSTOMARY INTERNATIONAL LAW AND THE TREATY LAW**

Water sustains life. Two-thirds of the Earth's surface is water, but 97% is in oceans, 2% locked in ice-caps and just 1% is termed as fresh water. Considering its importance in our daily lives and the limited availability of this resource, its purity needs to be preserved. This limited resource, access to which is a fundamental human right as per General Comment 5, should be utilized in a reasonable and an equitable manner. Fresh water, mostly found in rivers and lakes, needs preservation for the sustenance of life. A river can only be alive if there is some minimum level of flow in it at all times such that no harm is caused to the environment. States have been diverting waters from the rivers mostly to build hydro-electric power plants, many a times without maintaining this minimum flow of water. Internationally there is no statutory criteria fixed to ascertain what is minimum flow which is why it becomes all the more difficult to maintain it especially when two or more states are sharing the waters of a transboundary river. Nature knows no boundaries; therefore diversion done by an upper riparian state without keeping the environmental principles in mind has a negative effect upon the lower riparian states. Such states either formulate treaty amongst themselves deciding the criteria to share the waters of the Transboundary River or refer to the customary international law principles that have been codified in the United Nations Water Courses Convention on sharing of transboundary water. Many a times the policy makers exclude the principles of customary international law relating to water sharing while formulating such treaties. Similarly the Indus Waters Treaty, 1960 that decides the sharing of the waters of river Indus between India and Pakistan, with the World Bank as the third party, does not give any methodology to measure minimum flow rather does not even mention what minimum flow is. However when the dispute arose between India and Pakistan regarding the diversion of water due to construction of Kishenganga Hydro-electric Power Plant, the Court of Arbitration decided upon the level of minimum flow without referring to the customary international law principles. Therefore the author in this article argues that minimum flow should be decided by taking into account the customary international law principles of environmental law. The author also delves into the relationship between a treaty and a subsequent custom and holds that when a treaty restricts the application of customary international law principles to the interpretation of treaty still the subsequent customs are to be referred to while interpreting a treaty else the treaty would stay frozen in time. The Statute of the International Court of Justice does not mention any hierarchy amongst the different sources of International Law therefore, the author is of the view that the right to build a hydro-electric power plant, even though established by the treaty should not be higher in hierarchy to the customary international environmental law principles that deal with the protection of the basin as a whole.

**0518269 SUCHITHRA, MENON C (National Law School of India University, Bengaluru). CHILD AS A CONSUMER WITH FOCUS ON FOOD SAFETY**

Consumerism is a way of life in contemporary globalized world. Modernity is also marked by the rise of mass consumerism, and by its ascendancy of the consumer over the producer.

Blackwell Roger et.al. have indicated that consumer behaviour is learned as a child. Family communication about purchases and consumer behaviour is the key to children's purchases, Roy Subhadip has noted that children are emerging important as consumers due to their increasing influence on the purchasing decisions of their parents. Considering children as the 'new age' customers, marketers all over the globe are devising unique strategies to tap into their portfolio. The 'pester power' of the children influence their parents purchase decisions in their favour. In spite of these, child as a consumer often do not get the required attention. In *Spring Meadows Hospital v. Harjol Ahluwalia through K.S Ahluwalia*, the question posed was whether child is a consumer. The Apex court held that children are usually beneficiaries of the services and products paid by the parents, and hence they are also consumers.

Even though the Consumer Protection Act, 2019 has brought in significant progress in consumer protection laws, the concerns of child consumers are not fully addressed. The paper tries to flag this issue by analyzing food safety for child consumer as an important issue.

The consumption of unsafe food products results in a vicious circle of diseases among children. The consumption of food products with high fat, high sugar contents have lead to health risk such as obesity, high cholesterol level, and high blood pressure among children. It may be noted that junk food and carbonated drinks were banned in schools and policies focusing on health and nutrition among school children were specifically discussed by the Supreme Court in *Uday Foundation for Congenital Defects and Rare Blood Groups v. Union of India*, case. The Food Safety and Standards (Safe food and healthy diets for school children) Regulation, 2019 precisely focuses on this issue.

Based on analysis, it is concluded that there is immediate need to develop intense right based approach for protecting the interest of the child consumers from being exposed to unsafe food.

**0518270 TARENIA, AMENDRA (Dhenkanal Law College, Dhenkanal, Odisha). WATER POLLUTION CONTROL AND LEGAL MECHANISM IN NGT PROSPECTIVE**

Today in the twenty-first century the greatest threat to our water resources undoubtedly comes from pollution. While this is a problem worldwide it is particularly severe in developing nations due to the presence of large populations, poor finance and lack of scientific expertise. Undoubtedly, in a country like ours struggling to achieve industrial growth the problem of water pollution has to be addressed urgently in order to avoid large-scale public calamities. Water is an indispensable factor in the life of organism. It is universal solvent in which practically all the minerals, present in soil may be dissolved. It supports life system and its shortage has been the major problem of human beings. With the rapid growth in population and advancement in Indian economy the environmental pollution has been on the increase and it has become one of the greatest evils of the present time. Water pollution is one of the major concern of environmental pollution in India. It is responsible for more than eighty percent of the diseases due to dirty water and poor sanitation which sums up the reason why it is felt that our future war shall be for water rather pure water.

Life of a human cannot be sustained with polluted water. Article 21 of the Constitution of India provides that every person has the right to life. This Article includes in it, the right to pure water for drinking . Pollution-free water is the only hope for the healthy life. Article 47 imposes duty on the state to raise the level of nutrition and the standard of living including improvement of public health. It is the duty of the state to provide pure water to the public. It is also the duty of every citizen under Article 51A(g) to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures. Polluting a river is dangerous because a river is the primary source of drinking water for towns and cities downstream of the point of pollution.

Before independence there were number of acts prevalent to combat water pollution. Earlier Legislation like the Nuisance (Bombay and Kalaba). The orient Gas Company Act, 1857, Indian Penal Code 1860, The Serais Act, 1867, The Bombay Irrigation Act. 1873. The Northern India Canal and Drainage Act, 1873. Obstruction in fair wages Act, 1881. Indian Fisheries Act, 1897, India Port Act, 1908, Land Stream and Vessels Act, 1917. India Forest Act, 1927 enacted to prevent and control the pollution of water bodies.

After independence, in 1976 42<sup>nd</sup> Amendment to the Constitution was brought out which added Article 45 (A) and Article 51 (A) (g) provided the provision to protect and improve natural environment including water bodies like rivers and lakes. The water (Prevention and control of pollution) Act, 1974. The Environment Protection Act, 1986 and Environment Protection Rules, 1986 are enacted to prevent and control water bodies pollution.

The water (Prevention and control of Water Pollution) Act, 1974 “The act to provide for the prevention and control of water pollution and maintaining or restoring of wholesomeness of water, for the establishment, with a view to carrying out the purposes aforesaid, of Boards for the prevention and control of water pollution.

There are numbers of legislation enacted for controlling and preventing water pollution. The water pollution legislation alone is no solution to any problem of water pollution, the real effectiveness lies in its implementation and enforcement of machinery to different water pollution arise industries. According to The

Supreme Court view towards sustainable development, precautionary principle and polluters pay principles, the central government compels to enact The National Green Tribunal Act, 2010 to meet the challenges arising due to the right of the victims of the environmental damages and compensation.

A new legal Approach led to enact the National Green Tribunal Act, 2010 which came into force in June 2010. This NGT Act, first time vests the power of a Tribunal to provide for 'relief and compensation to the victims of pollution and other environmental damage', 'for restitution of property damaged' and 'restitution of environment. This article looks at the existing legal mechanism in India that addresses the issue of water pollution and analysis how effective, these have been in mitigating the menace of water pollution.

**0518271 YADAV, AKSHAY (National Law School of India University, Bangalore). ACCESS TO CONSUMER JUSTICE UNDER CONSUMER PROTECTION ACT 2019**

This paper attempts to present comparatively analyse provision for Access to Consumer Justice under Consumer Protection Act 1986 and Consumer Protection Act 2019. The paper throws light on the development that has strengthened the legal and policy framework for the better protection of Consumer and the relief and remedies that are available to Consumer. Now it is the only need for effective implementation of the Consumer Protection Act 2019 which would be a new revolution in the society in promotion the interest of consumers.

## 19. LINGUISTICS

### 0519272 KUMAR, PRITEESH (Jawaharlal Nehru University, New Delhi-110067). COMPARATIVE GRAMMATICAL ANALYSIS OF ENGLISH AND RUSSIAN LANGUAGE

Language has different roles and responsibilities for depicting the culture, tradition etc of that region. In spite of being a different place in language family there exists a similarity and dissimilarity. Both languages belong to the Ind-European family of languages, but to different groups. Russian to Slavic group, and English to Romano-German. Today, English is one of the most widely spoken languages in the world, ranked 2nd in the world by the number of speakers (341 million people), is the official language in 10 countries, the second official language in 30 countries. Russian, is on the 4th place in the world in the number of speakers (180 million people), is the official language of the Russian Federation, the second official language in 11 countries. Both languages are official languages of the UN.

And studying the structure of language is a most important aspect because all languages are different in their lexical, morphological and syntactic structure. In the process of learning a foreign language, we are faced with numerous mistakes in speaking and writing, as it is very difficult for us to wean ourselves from the rules of the native language. Therefore, we always compare the linguistic phenomena of the native and foreign languages, studying their grammatical system and vocabulary. According to another classification, English is inflectional, i.e., it has no endings, unlike the Russian language, which has case endings in many parts of speech, i.e. it can be called inflectional.

This paper will illustrate the theoretical foundations of Russian and English grammar, their comparison in order to try and to understand the structure of the modern English language as accurately as possible, and, based on this understanding, to make a comparative analysis of individual grammatical phenomena of both language.

### 0519273 MAJI, PRIYA (Department of Basic Science and Humanities, Asansol Engineering College, Asansol). THE ARCHITECTONICS OF 'OTHERING': A RE-READING OF ARUNDHATI ROY'S GOD OF SMALL THINGS

Many a book penned down by famous authors do not have the enticing charm of making a reader re-read the book once again after its completion. However, when it comes to Arundhati Roy's seminal work "God of Small Things" we find its richness, which is in abundance captivating the readers:

The text "Offers such magic, mystery and sadness that, literally, this reader turned the last page and decided to reread it. Immediately. It's that hauntingly wonderful." Deirdre Donahue, USA Today. The first endeavour in this paper is to uphold Roy's most probing issue, i.e. caste. We shall come to know how this all encompassing issue of caste plays a pivotal role in everybody's life and is a reason of bringing in a turning point in their life. Even after the attainment of Independence and experiencing the wave of Renaissance one of the social malice that has not been evaded from the society is Caste System. Specifically, we see two characters that do not follow the set standards of the society and are perished, they are Velutha and Ammu. One had to give up his life on false allegations and the other ends up her life in loneliness. Velutha and belongs to the Paravans, the Untouchable caste. With the flash backs of the various occurrences it is also mentioned that when the British came to Malabar, Velutha's grandfather had converted to Christianity so that his family could escape the discrimination they faced under the Hindu caste system. Velutha, even though he is one of the best skilled workers the other factory workers aren't thrilled because of his class status.

Apart from the issue of caste-system this paper shall also speak about the treatment of women in a male dominated society. In such a society the codes and moral standards by which human beings are judged are stricter for a woman than for a man. Society expects feminine qualities like caring, rearing and nurturing only from a woman even at the cost of her dignity. Ammu has to face ostracism by both the society as well as her family. Even her children are ill-treated they are considered as an unwanted botheration and unnecessary burden. She has a divine love for Velutha as he turns out to be that person in Ammu's life who not only loves and cares for her but offers her

everything that has been denied by others. Probably that's why, Ammu discovers a companion in Velutha. She feels safe with him, finds comfort in his presence, gets passion, and warmth in his arm and knows the real love.

The paper shall thus speak of the untold miseries and the undeserved sufferings of women who have to bear the brunt of male domination silently and meekly. Roy transcends the concept of feminism by portraying not only of the plight meted by men on women, but by also examining the feminist jealousy between the woman and women. 'She' is pulled down to this earth where 'She' has to 'grovel in the lowly dust.'

**Keywords: Caste System, ostracism, untouchable, plight, feminist jealousy.**

## 20. MANAGEMENT SCIENCE

### **0520274 BHAVYA, N. (Manipal Academy of Higher Education, Manipal). RETURNS POLICY FOR COMPUTER HARDWARE PRODUCTS- A CRITICAL STUDY OF CONSUMER BEHAVIOUR IN BENGALURU CITY, INDIA**

Consumer product returns are inevitable with the advancement of new technology and variety of product options available. The objective of this study is to understand if there exist any relationship between the return policy of computer hardware companies with the consumer purchase behaviour or pattern, is there any impact of consumer buying with the product brands, the study tries to throw light on the importance of a good return policy for both manufacturers and the consumers. How does a customer perceived return policy and are they satisfied with present return policy of companies? The study has fifty-five respondents of various age group and professional category. The data was collected through Google forms. The statistical measure used in the study is correlation. The study found that there is a cause of concern, the consumers are not much happy with the service provided by the company after purchased. In spite of this consumers make online purchases because of dependability of the computer for performing their jobs. The results show that some credibility has been established by the companies in accepting the products returned and replace the product or make repayment of product purchased within the time promised. Social responsibility of the company and reason for choice of the brand are strongly associated. The evidence from this study strongly indicates that return policy is associated with environmental policy of the company.

**Keywords: Return policy, Social accountability, Environmental responsibility, Computer Hardware and peripherals.**

### **0520275 HARSHA, HEMA (Manipal Academy of Higher Education, Manipal). LEADERS AS TALENT STEWARDS IN SCIENTIFIC RESEARCH ORGANIZATIONS-AN ANALYTICAL STUDY**

An Organization's success is not limited to the measure of its financial performance but is also influenced by the intellectual capabilities it possesses. Organizations today, have diverse talent, which needs to be continuously identified and nourished, ensuring that the organization sustains talent. Contributing to this development of intellectual capital, are the leaders who play a major role by holding the baton of both - profitability of the organization and developing potential for sustained growth in the future. Effective talent management practices, performance outcomes and talent culture are management tools that good leadership leverage to build organizational brands through intellectual assets. The task of building this intellectual asset though a collective effort of all the organizational leaders need leaders at various functional levels play a pivotal role in enabling team members thus building a strong intellectual bank within the organization. The role envisages these individuals being a critical talent identifier, nurturer and developer, ensures that talent within the organization continuously transcends benchmarks while vision for future talent is also in focus.

Scientific institutions engaged in research work, with a different work culture and environment, face some unique set of challenges in attracting, motivating, retaining talented people and sustaining talent. While the HR team addresses these unique challenges to some extent as "one" of their "to do" activities, it is imperative that the leaders are proactively engaged in these dimensions of HR functions.

This study is an attempt to identify the role of a leader as a Talent steward, their impact on talent building, nurturing and development with specific reference to select scientific organizations in India. The research settings for this study spans across nine highly acclaimed scientific research organizations in India. For the purpose of this study, empirical evidences are drawn from qualitative interviews and quantitative data, along with inputs from literature reviews. The study was undertaken to assess the influence of leadership on talent management practices, critical talent identification and most essentially building of a talent pipeline for meeting future demands of the organization.

Data collected was subjected to Principal component analysis (PCA) to identify the potentially correlated variables and five principle components were identified. Impact of Leadership, one of the five components, is identified by nine variables and their relevance tested. The component value of these nine variables establish that these nine variables are highly relevant in scientific organizations in the Indian context. The study reveals that Leadership in a talent dominant organization can effectively leverage and deploy these nine variables to play a greater part for setting standards and fulfilling the vision of the organization.

**0520276 LIKITHA, S. (CHRIST University, Bengaluru). USER EXPERIENCE AND CONSUMER BEHAVIOUR: THE INFLUENCE OF COLOUR, LAYOUT AND AESTHETICS ON THE CONSUMER**

User experience has emerged as the key element while designing websites and mobile applications. However, it is important to understand the implications of the design, specifically, the colour, layout and overall aesthetics on the consumer's decisions. The objective of the paper is to examine how the design of a website influences the consumer's behaviour. The paper highlights the cognition and perception of the consumer while focusing on the design of the websites. Issues, as identified in the current research and recommendations for future user experience-based research, has been provided. A systematic review of website design, usability and aesthetics literature about user experience was performed.

Pro-Quest and ABI INFORM were systematically searched. Due to the limited amount of research that has examined the influence of web design on consumer behaviour, published research that included varying determinants types were included in this review. The selection criteria for this review include those studies that were: (1) written in English and (2) examined web user experience in various settings. Of the thirty user experience-based articles referenced in this paper, a significant sample of studies report on the examination of antecedents and/or consequences of website design specifically, layout, colour, aesthetics and usability, on consumers' buying behaviour. Key findings suggest that there is a significant positive relationship between colour, usability, aesthetics and buyer behaviour. A common implication in this body of research was that of the design & usability-based impact.

The study of user experience and its relationship with positive consumer behaviour based on the design of the website can be achieved by focusing on the usability of the website using effective implementation of layout, visual hierarchy, navigation design and colour scheme. Future research is needed to provide designers and marketers with a better understanding of how deeply these design factors impact the consumer behaviour.

**Keywords: Literature Review; User experience; Website design; Consumer behaviour; Aesthetics**

**0520277 MAHADEVAPPA, BHARGAVI; PRIYADARSHINI, B A AND SINHA, RITIKA (Bangalore University, Canara Bank School of Management Studies, Central College Campus, Palace Road, Bengaluru). AWARENESS AND ADOPTION OF GREEN TECHNOLOGY IN HIGHER EDUCATION**

Green technology, also known as sustainable technology, is one the powerful technology which can minimize the pollution and degradation of the environment and help in safer environment. Green technology is significant in the field of education to inculcate student's interest in appreciating the environment. Green education helps the Academicians, administrators, students to incorporate awareness and adoption of environmentally friendly practices in the learning process. This conceptual paper aims to provide environmentally friendly information and sustainable education with respect to importance of green technology and awareness among the community about environmental conservation Therefore, the awareness of environmental conservation should be nurtured since childhood as those who will change the next generation. Education can help transform the next generation to conserve safer environment, pppportunities to go green, challenges to go green, the consequences of going green, and sustainability of education sector by technology adoption are also discussed.



The green technology skills that were targeted are energy efficiency and management, planning and design of sustainable facilities, sustainable and green construction, sustainable and green manufacturing, and renewable energy sources such as biomass, solar power, and wind energy technologies.

Green education also includes enhancing student knowledge in using green technology.. Computer and information technologies are already considered as green technologies due to their contribution to clean environment in many industrial automation processes. Green nanotechnology has been described as the development of clean technologies, "to minimize potential environmental and human health risks associated with the manufacture and use of nanotechnology products, and to encourage replacement of existing products with new nano-products that are more environmentally friendly throughout their lifecycle. Green nanotechnology is the study of how nanotechnology can benefit the environment, such as by using less energy during the manufacturing process, the ability to recycle products after use, and using eco-friendly materials Sustainable development focuses on preserving the present resources for the future generations. The resources are exhausting at a fast pace which means there's a continuous demand for products and services which causes burden on the planet. Along with economic development there is a need for environmental uplifting. Unless environmental sustainability is achieved sustainable development cannot be achieved. Lifestyle of people should be within the planet's ecological setup. Reduce, Recycle, Reuse are the three terms mostly used by every individual or corporate or nations.

To aid in greening colleges and universities technology can be of main help. Technology must be incorporated into the sustainability program across all streams of higher education such as operations, research, and student learning and in house and outreach community programs. Technology will help in designing interactive workshops, collaborations between institutions, consulting projects and for promotion of vision of green higher education. Environmental technology education can be incorporated in curriculum development and program improvements. Green technology in education helps in building energy technology, energy conservation, efficiency in energy and renewable energies.

This paper is a step towards instilling education in young graduates and postgraduates to become aware of green technology and also help them in building their professional careers as decision makers in green education with green technology.

**Key words: Green Education, Green Technology, Sustainable Development, Higher education**

**0520278 MUNINARAYANAPPA, M. AND VARNA, K. B. (Bangalore Central University, Bengaluru). THE IMPACT OF GLASS CEILING ON ORGANISATIONAL BEHAVIOUR – EFFECTS OF IMBALANCE RATIO ON WOMEN HIGHER-UPS**

An organisation has its own culture, structure, objective being framed initially which helps in achieving their purpose. Each organisational structure differs: But, the ceiling created for women higher ups is to a certain extent parallel. The research goal of this paper is whether the ratio of women higher-ups is less or not and is the external or internal factor influencing the above title.

The resourcefulness of the paper is to understand the part of glass ceiling is being created by organisational behaviour or the internal factors that affect the lesser women executives in an organisation. Is really there is an imbalance on women higher ups. The paper is pragmatic in nature. The basis of data is retrieved from first hand data by collecting essential realities through survey supporting with a structural questionnaire and the subordinate data by studying offered works. The reliability of the questionnaire is being tested through cronbach alpha. The sample size is 60 women middle level employees who are in the edge of promotion in Bengaluru city. There was a general interview with the higher executives for unbiased investigative result. The questions includes demographic and psychographic interrogations, the probable test used in this paper is factor analysis. The probable result might be does glass ceiling exists in imbalance of women higher ups.

**Key Words: Organisational Behaviour, Glass Ceiling, Imbalance, women higher ups.**

**0520279 NATRAJ, ANU A. (Manipal Academy of Higher Education, Manipal). SOCIAL LEARNING AND ITS IMPACT ON PERFORMANCE OF NURSES AT SUPER SPECIALITY HOSPITALS IN BENGALURU: AN EXPERIMENTAL APPROACH TO TRAINING**

Social learning theory is a concept which enables people to learn about one another by observing and imitating each other's behaviour. Since health sector has shown remarkable improvement towards increased health awareness, improvement in access to medical facilities and reachability of hospitals to common people thus in recent years it has become platform for continuous social contact and interaction. Day in and day out all the healthcare staff continuously communicate with one another to treat the patients by observing the techniques of treatment through social learning thus it becomes an important aspect to their productivity at hospitals. Nurses are the second phase health care system and they are core support for patients as they work closely with them. Nurses act as an intermediary between patients and doctor who form critical basis for treating the patients. This is how the nurses learn and experience the required skills by observation, interaction and assimilate learning to transfer effectively in the hospitals. This study is on how the social learning can be used as an important tool of training to assess the Learning behaviour of Nurses.

The aims of his study are:

1. To identify factors contributing to social learning in context of Hospitals;
2. To study the impact of Social Learning on Behaviour of Nurses &
3. To ascertain Social learning enabling performances.

The process of Research Design began by a check list used for building up questions to the target group (Nurses). In addition, after several interviews, a comprehensive questionnaire was developed which was mostly closed ended to enable capturing right reflections on learning on the field. As many as 60 instruments were administered and have been used for processing the key preliminary findings that are documented here.

The Critical factors that contribute to social learning were identified as attention, retention, reproduction and motivation. The important preliminary finding that they learn a lot by observing doctors at OPD ( Outpatient department and OT ( Operation theatres).

**Keywords: Social Learning, Super Speciality Hospital & Training.**

**0520280 NAZEER, IRSHAD (.....).THE NEED OF CATAPULTING OF INDIAN MANAGEMENT EDUCATION INTO HIGH GROWTH TRAJECTORY**

India is the largest producer of management graduates. The management schools are classified into broadly three categories and the third category include departments of MBA at various universities, all affiliated colleges offering management education affiliated to respective universities and approved by the AICTE, all institutes offering PGDM/PDBM courses approved by the AICTE and all institutes offering MBA/PGDM/PGDBM neither approved by the AICTE nor affiliated to a university. The quality of management education in all these is not up to the expectations of the recruiters and hence majority of the graduates from this category is unemployed or under employed. This paper probes the ways to reorganize, reposition and restructure the management education system to capitalize the demographic dividend for the betterment of the nation's economy.

**0520281 PRASANTHI, E. AND REDDY, P. NARAYANA (Department of Management, Sanskrithi School of Business, Puttaparthi). STAKEHOLDERS PERCEPTION OF INDUSTRY MANAGEMENT EDUCATION**

In this paper an attempt has been made to assess the preparedness of management institutions to industry expectations. The present day business and industry is facing cut throat competition to survive. The sole aim of the modern business is how to improve profits and reduce cost. In this process, reducing the human resources and depending on machines has become the priority. This result in developing high skilled people to meet the industry

expectation is highly desirable. Unless management institutions prepared to incorporate the disruptive innovations in its own curriculum, pedagogy, teaching learning process, they may become obsolete. This study focused mainly on to assess the stakeholders' role and responsibilities in promoting quality management education in the country. In other words, how the institutions orient their efforts towards industry 4.0 and making efforts to facilitate improved teaching learning process. The Study carried out with the help of 157 sample respondents from management representatives, industry representatives' students and faculty.

**Keywords: Institutions adaptability, future avenues for students, Industry 4.0**

**0520282 PUSHPA, B. V. (Manipal Academy of Higher Education, Manipal). PENSION PLANS: - A CRITICAL THOUGHT ANALYSIS OF SELECTED PENSION SCHEMES IN INDIA**

Pension system in any country will have social and economic ramifications. Pension system in India has a strong growth potential. India has two types of pension plans: Defined benefit plans and Defined contribution plans. Defined Contribution pension plans aid in achieving long-term retirement wealth to an individual. The wealth accumulated by the investor depends on how a plan sponsor invests uses the benefit of diversification of portfolio to pay the beneficiary optimum returns. In spite of efforts by government and pension regulators, DC plans have failed to gain popularity and wide acceptance by individuals. The main reason being low or sub optimal returns to the beneficiary. The investment framework and portfolio solution should take into consideration factors such as age of the investor at entry, exit, vesting period, expected amount of pension benefit on retirement along with efficient policies to manage risk of investment. An employee in the unorganised or private sector tend to experience disparity in the returns in defined contribution plans. The study aims at evaluating of pension plans of the government and the organisations, exploring possibilities of a theoretical construct on pension with parity under an emerging and a market-oriented economy. Parity is in terms of converging organisational issues of transfer of factored in funds with that of the returns to the investors in Indian context. The study intends to provide a feasible solution to investor's problems of decline in value of money due to long term accumulated long-term savings. The study attempts to evaluate select contribution plans in terms of average returns, standard deviation. The analysis of variance (ANOVA) reveals that there are significant differences in the average returns across eight plans studied in India. Further, there is an evidence on heteroscedasticity of variability of returns. While all the plans studied for their returns showed strong differences in their performance, the cause of worry for an investor is on not stable returns. There is thus a need for a pension plan with definite returns on par with direct benefit pension plan of employees of the Government. A theoretical construct has been developed to be tested for its practicality. Further, the results of the study provides insights to the organisations and facilitate them to rehash their policies on portfolio management of funds by evolving pension schemes on par with Direct Benefit Schemes (DBS).

**Key Words & Phrases: Pension plans, Returns on Investment, Anova, pension plan design.**

**0520283 RAJAGOPAL, SUDHA (CMS, Jain University, Bangalore). MANAGEMENT FOR SUSTAINABLE ECONOMIC GROWTH : A REVIEW AND ASSESMENT OF SOME RECENT STUDIES AND ON-GROWTH ACTIONS**

Sustainability, Economic Growth/ Development and Management Science : Can these terms, along with the concepts they connote, be brought together to form a cohesive policy – workable for all stakeholders to full capacity, repeatedly, in the medium and long term? And go beyond just economic well being, to engage with the right hemispheres of humans, essentially to become better people and create a good Earth.

Sustainability of both regenerative and restorative principles, stands on the fundamentals of global social equity, and healing and reviving the planet Earth. It aims to meet the needs of the present without consuming up the ability of future generations, both in terms of inter-generational and globally intra-spacial levels to meet their own needs, now and in the future.

Economic growth is defined as growth (the key element) as a long-term expansion of production potential, measured by the metrics of percentages of increases in real GDP over some specific period, both at a national level

and at a per capita level points. The aim of economics should lead to development with equity and welfare. Management science follows on the course of recommendations of a set of actions that is expected to yield the best (majorly quantified in monetary terms like, least cost, maximum revenues etc) outcomes within the constraints of available resources.

This paper attempts to collate the literature and reads in this sphere. Assess the processes and gains arising thereof with their contextual background. The scenario is then presented in the Indian background, to check as to where all it is on track, sectors that needs to be primed up in the near term and sectors that may not be processed now and wait for technological developments that will enable leap-frogging in the future, to yield the best and desired results.

To review studies conducted in advanced economies as well as programs happening in India in this space and time. To see the fit or otherwise of those action plans to our situation and context.

- To find out situations which have yielded positive results,
- To assess the feasibility of adoption / adaptation in the system to achieve similar results

**Key Words: Sustainability, Economic Growth, Economic Development, Management Science.**

**0520284 RAMAGOPAL, S. (Manipal University, Manipal). SUPPLY CHAIN EFFICIENCY IN AGRICULTURE: AN EXPLORATORY ANALYSIS**

Food security is the condition in which all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Fruits and vegetables play an important role in human nutrition and health, It is of utmost concern to societies across the world that people – especially in less-developed economies - are assured of a reasonable intake of these items in order to live a reasonably healthy and active life, and in turn, contribute positively to the society. Ever since Agriculture heralded the onset of a next phase of civilization in our societies, the supply chains for agricultural products and produce have evolved in different ways in different parts of the world. The sub-segment of agri-fresh produce represents an important source of nourishment to humans. Changing life-styles and upwardly mobile demand warrant special attention on how these commodities are marketed and reached to consumers so as to ensure optimum benefits to all the stakeholders in the system.

Agri-Fresh Supply Chain Management is more complex because of the perishable nature, dependence on climatic conditions and highly fluctuating demand and prices of Produce, as well as increasing awareness and concern for food safety aspects. A natural adverse consequence of the above factors has been a very high percentage of wastage of agri-fresh produce in the post-harvest segment of the supply chain, resulting in high prices for the consumer, as well as low realizations for the primary grower, or the farmer.

This research work paper seeks to examine as to how Supply Chain Management can contribute to better value for consumers and fair and motivating returns for the farmers even while contributing to optimal loss / wastage of agri-fresh produce during their journey ‘from farm to fork’.

It is seen that better alignment of objectives of- and strategies adopted by- the agricultural supply chain players, assisted by greater levels of transparency and mutual trust, would help the supply chain to achieve higher efficiency levels and contribute to better realisations for the chain participants and greater customer satisfaction.

**Key Words: Supply chain management, Agri-fresh produce, Supply chain alignment, coordination, transparency and trust & food wastage.**

**0520285 RANI, SANDHYA S. R. (.....). CHARITY BASED ORGANIZATIONS: ITS IMPLICATIONS ON SOCIETY MANAGEMENT IN INDIA**

There are more than 50.77 lakh registered organizations called NPOs in India. All these organizations are contributing to support infrastructure & are on the verge of becoming fourth sector adding to GDP of the country. The main source of these organizations are their Donors. Donors provide support, wherewithal & associate with the office bearers to enable them to accelerate their activities.

An overview of five select Not for Profit Organisations (NPOs) in the world & five in India has been done here. The wide range of service products & offering to the defined target group have been discussed at length. The selection of NPOs has been made by taking into cognizance performance & its ranking in the sector.

Charity or Daana as a concept is across all Religions. Interestingly, the core of the concept is the same while the application or practice of the concept is in accordance with culture & heritage. All these select organizations have clearly stated Vision, Objectives, Goals & plan of Action. They continue to exist mainly because of unconditional support from masses, the respective Governments & performance without expectations.

**Key Words & Phrases: NPOs, Charity, Daana, performance without expectations & Donors.**

**0520286 SAHA, SUMIT AND KUMARI, PRITY (Department of Management, CMR University, Bangalore). DETERMINANTS OF CROSS-FUNCTIONAL SALES PERFORMANCE VARIABLES IN IT/ITES**

This researcher referred a lot of previous studies in this field and concluded with the 23 antecedents suggested and strongly used in previous studies, and 10 more on researcher's judgmental choice from experience, 33 questions addressing 33 indicators from 26 sample size to apply on the IT companies for the pilot survey. This exploratory research helps the IT/ITes companies to identify the cross-functional factors and their impact, which leads to better revenue growth for IT companies in Bangalore along with a statistical model to measure the company performance based on the identified factors through factor analysis, after parent survey. This research does not focus on professional skills, and demographics. This research identifies the 19 determinants of cross-functional sales performance indicators with very high reliability (Cronbach alpha = 0.870), as a precursor of the parent study and factor analysis. These indicators put negative/ positive effects on the overall organization's sales performance and the revenue growth of the company. Creating a statistical model, based on the final and parent survey post to this pilot survey analysis, is unique and unprecedented to measure the current industry standard or, benchmarking of a company with respect to the same industry also leads for better strategic support to the sales team towards the revenue Growth.

**Keywords: Sales performance, cross-functional factors, sales performance factors, factor analysis, Salesperson performance, Strategy, Statistical Model**

**0520287 SHANKRAPPA, MENEDHAL MANJUNATH (Manipal Academy of Higher Education, Manipal). RESTRUCTURING OF CREDIT AND INVESTMENT PORTFOLIOS OF BANKS – A PILOT STUDY**

The banking industry in India is playing a key role in overall development of the economy. It provides financial assistance to almost all the sectors of the economy. The major portion of financial assistance of the banks is allotted not only to the industrial sector but also to the agriculture and household sectors. In a real sense, the banks are credit creators. The main purpose of the paper is to evaluate the performance of Indian banking system in terms of credit and investments. The study considers the entire banking industry and a pilot data for the period of ten years i.e. for the period from 2008 - 09 to 2017-18 is considered for the study. The time series data are drawn from different sources such as Centre for Monitoring Indian Economy (CMIE), Economic and Political Weekly (EPW), Central Statistical Organisation (CSO), Reserve Bank of India (RBI) and other sources. In case of truncated data, the pilot test replaces blank data by respective averages to enable conclusions without affecting the quality of data. The key variable considered for the study includes Balance sheet operations, profitability, and asset quality, sectorial

deployment of bank credit, technological development and consumer Protection. The study uses linear regression technique for the analysis. The results of the regression confirms significant structural changes in credit and investment portfolios over time. Significant changes can be noticed in the profitability of the banks and also in the capital adequacy norms over the period of time whereas Capital to Risk Weighted Assets Ratio is not statistically significant. The Gross NPAs and Net NPAs, non-performing assets ratio also affected and changed over the time period where as net profit not statistically significant. Further, changes in the credit deployment to various sectors (Gross Bank Credit, Agriculture, Industry, Services and Personal loans) are witnessed.

**Key words: Credit, Asset, Liability, Restructure, Statistical Significance**

**0520288 SINHA, SHYAM KUMAR (Technology Management, CMR University, Bangalore). PLANNING AND OPTIMIZING FREIGHT COST ASSOCIATED WITH SUPPLY CHAIN PROCESS OF AN ORGANIZATION ON VARIOUS FACTORS**

The supply chain process encompasses logistics. Transportation and logistics are critical elements of the supply chain where freight is part of logistics; however, supply chain management also integrates business processes other than logistics, such as production and marketing etc. As part of Logistics process, organization plans, implements and controls the efficient, effective flow and storage of goods, services and related information from the point of origin to the point-of-consumption for the purpose of conforming to customers' requirements. Beside the physical flow of the goods via freight transportation, logistics is also about inventory management. Transportation takes a crucial part in the manipulation of logistic. The operation of transportation determines the efficiency of moving products. Materials management describes the movement of materials and components within a firm, here; physical distribution refers to the movement of goods outward from the end of the assembly line to the customer. Logistics services comprise physical activities e.g. transport, storage as well as non-physical activities e.g. supply chain design, selection of contractors, freightage negotiations etc. Transporting large quantities by various transportation methods give significant cost and quality advantage.

Machine Learning techniques are used in various domains including SCM to give meaning insights from available data Classification is a machine learning technique which broadly used to predict group membership for data instances. Classification is organizing data into categories for its most effective and efficient use. There are number of classification methods including decision tree, Bayesian networks, k-nearest neighbor classifier, Neural Network, Support vector machine. The goal is to study freight cost issue related to Supply chain process and apply suitable classification techniques of data mining to get useful insights from it.

Paper main aim is to apply few machine learning techniques to optimize logistics which helps in optimization of existing production and distribution processes based on the same resources through management techniques for promoting the efficiency and competitiveness of enterprises. Here, it will also give insight about how good coordination among various components of organization would bring the benefits to a maximum.

**0520289 VAMSHI, SHREE AND KAR, SHUBASREE (CMR University). IMPACT OF PERFORMANCE EVALUATION PROCESS ON EMPLOYEE ENGAGEMENT. HAPPINESS BEING THE INTERMEDIATE FACTOR: A STUDY OF SME'S IN INFORMATION TECHNOLOGY SECTOR**

The Small and Medium Scale Enterprises being very volatile in nature take high amount of risk. It is, therefore, imperative for them to address the uncertainty through reliable and loyal work force which can shoulder them in good and bad times. HR has the challenge of attracting talent on role dimension and then retaining that talent with better performance evaluation process in context of information technology sector can be considered as a set of instruments or tools used to achieve the overall objective of organization. This research paper is an effort to find the impact of Effective performance appraisal in enhancing employees' performance and further increasing their job contentment in the leading Small and Medium size Enterprises (SMEs) IT sector, India.

The data are collected from 500 respondents from 50 SME's, IT companies located in Bangalore. The data were collected by circulating the questionnaire with the support of online survey app among the respondents. The

sample for the study was sourced via non-probability sampling and an online research panel. Online panels offer affordable, reliable data that closely approximates the labor force.

The data obtained was analyzed using multiple statistical techniques like the regression, correlation, factor analysis and structural model for comparing factors discriminating between distinctive groups of sample and regression analysis and came up with the structural modelling to analyze the various factors for better output. The findings of quantitative analysis were corroborated and validated with qualitative analysis to test the research hypothesis and answer the research questions.

The analysis has been able to establish the significant relationships of effectiveness of Impact of performance evaluation process on employee engagement: a study of SME's in information technology sector. The results also indicate that the Performance evaluation process has a significant and positive impact on the employee engagement.

The recommendations and findings of the study will hopefully provide advice and contribute towards evolving an integrated framework of Performance Management for Good employee engagement, in the emerging SME's in information technology sector.

**0520290 VIJAY, ARVIND SINGH (School of Management Studies, Dr. B. R. Ambedkar University of Social Sciences, Indore, Madhya Pradesh). THE ROLE OF MANAGEMENT IN INTERNATIONAL MARKETING**

Initially, the benefits and disadvantages of a standardized and localized strategy are discussed in this article. The importance of the cultural patterns in use is explored. In addition, the research approach required for international marketing is briefly identified and evaluated in the context of new international penetration. As globalization accelerates, companies are now being strengthened to ensure that they effectively respond to market-related consumer needs and expectations in this regard. In this sense, the development and implementation of the strategy has been improved. In addition, these companies are able to reach and explore all major established markets in the world, as well as expand and explore new and less developed countries. Price issues are particularly relevant.

**Keywords: Strategy, Cultural, Market, Consumption Marketing, Standardized, localized, Introduction. Strategies, Advertising, Global, Pricing, Channel, Structures.**

**0520291 VISWANATH, N. S (M.P.Birla Institute of Management & Department of Economics, Bengaluru Central University, Bengaluru). SOCIAL SCIENCE RESEARCH & MANAGEMENT OF SOCIETY - A THOUGHT ANALYSIS**

The present study aims at examining the use of research in management and social sciences in supporting organizations, societies and Nations. Ideas and thoughts are drawn from various sources to make an assessment. A broad conclusion is that not much research has been used in solving human problems. There is a need to connect research thoughts to match with reality for effective dissemination.

**Key Words: Science, Society, Management, Convergence of Ideas & Dissemination of Research Thoughts.**

## 21. MATHEMATICAL AND STATISTICAL SCIENCE

**0521292 BANU, AYEESHA W AND NARGUND, ACHALA L (P. G. Dept. of Mathematics and Research Centre in Applied Mathematics, M.E.S. College of Arts, Commerce and Science, 15<sup>th</sup> Cross Malleshwaram, Bangalore- 560012). JACOBI'S SUM OF SQUARES**

The survey of "Jacobi's Sum of squares" and calculation of the number of representations of a given positive integer into sum of two squares, "sum of square and twice the square" and "sum of square and thrice the square" based on divisor function is studied. Calculating manually, the number of representations, may although seem to be interesting at the beginning for smaller numbers, but later on becomes a tedious job for larger numbers. Fortunately we have formulae for sum of squares given by Jacobi, which directly gives us the number of representations. This paper also consists of proofs of theorems given by Michael D. Hirschhorn from Jacobi's triple product identity and Ramanujan's  ${}_1\psi_1$  summation formula.

**Key words : Jacobi's sum of squares, divisor function, Jacobi's triple product identity, Ramanujan's  ${}_1\psi_1$  summation formula.**

**0521293 JAGGI, CHANDRA K. (Department of Operational Research, Faculty of Mathematical Sciences, New Academic Block, University of Delhi, Delhi-110007). SUPPLY AND RELIEF CHAIN MANAGEMENT**

A well-known story about the tortoise and the rabbit, the speedy and overconfident rabbit fell asleep in between the race, while the turtle won the race being "slow and steady". That may have been true in stories, but in real life slow and steady won't get you out of the entrance because everyone getting faster and smarter in today's challenging competitive environment. That's why the best organizations are coming up with a powerful new source of competitive advantages. In this context, it is called the supply chain and it involves all of those integrated activities that make products available to the market and create satisfied customers. To remain competitive, organizations must hunt for new solutions for important issues of Supply Chain Management (SCM) such as cost optimization, production planning, route planning, distribution network design, warehousing and inventory control and many more.

The supply chain cannot be considered in certain conditions only, but also in uncertain environments. Therefore, if one looks into the uncertain environment, disaster may happen at any point of time, physical location i.e. earthquake, flood, tornadoes, hurricanes. If any disaster happens, relief organizations (private or government) starts to provide facilities as evacuation and supply of relief commodities in the affected locations. In this submission, a mathematical model is formulated with an objective to optimize the cost of the whole operation i.e. managing inventory and distribution of relief commodity from the central distribution center to the relief centers. For the purpose, a mixed-integer nonlinear programming problem is constructed with suitable constrained and explained with a suitable example.

The current paper discusses the nature and role of SCM within the organization and out of the organization in a certain and uncertain environment as well. It brings to light the reasons why SCM is necessary for every organization and how a relief chain can be optimized. Further, the presented model will be useful for different relief organizations in the distribution of relief commodities.

**0521294 LAKSHMI, B N AND ASHA, C S (P. G. Dept. of Mathematics and Research Centre in Applied Mathematics, M. E. S. College of Arts, Commerce and Science, 15<sup>th</sup> cross, Malleshwaram, Bangalore-560012). HOMOTOPY CONTINUATION METHOD TO SOLVE SYSTEM OF NONLINEAR EQUATIONS**

Numerical method is a mathematical tool designed to solve the problems arises in the field of mathematics, engineering, computer science and physical sciences. There are several methods to solve the system of linear and nonlinear equations, such as iterative methods, approximation methods and interpolation methods. In this paper we



use Homotopy Continuation Method to solve system of nonlinear equations. This method reduces a difficult problem into a simpler problem and helps in finding the solution of the original problem. It is both locally and globally convergent and numerically stable. It is used to calculate critical loading condition with nose curve, stability analysis in the global minimization of the Gibb's free energy and convergence analysis in multi-phase, multi-reaction equilibrium systems. Homotopy Continuation method is different from iterative methods. The advantage of this method is that one can find the solution of the problem by choosing an arbitrary initial value. Unlike the iterative methods, where one has to have enough knowledge about the location of the root to find the initial value. If the initial value is closer to the solution then the method will be more efficient, otherwise the solution will diverge from the actual solution. In this method the system of nonlinear equations are reduced to system of linear differential equations, which are solved by Runge-Kutta methods. We have compared the Continuation method with Broyden's method and found that the results are more accurate in Continuation method.

**Keywords: Non linear, Convergence, Stability, initial value, approximation.**

**0521295 MAJHI, ASHISH KU. AND DASH, SUJATA (Department of Computer Application, North Orissa University, Baripada, Odisha). A COMPARATIVE ANALYSIS OF DIFFERENT PHYLOGENETIC METHODS FOR CLOSELY AND DISTANTLY RELATED SPECIES**

Phylogenetic Tree is the study about the relational tie between the organisms. From Phylogenetic Tree we can get the detailed idea about the group of species and their common ancestors. Phylogenetic Tree is of two types such as rooted tree and unrooted tree. Phylogenetic Tree has two components which are internal nodes (represent ancestral unit, also called as (HTU) Hypothetical Taxonomic Units) and terminal nodes or Leaves (represent data under comparison, also called as (OTU) Operational Taxonomic Unit). Phylogenetic Tree is constructed using different phylogenetic methods like molecular clock hypothesis, distance matrix method, character-based method. Molecular Clock Hypothesis states that DNA and protein sequences evolve at a rate that is relatively constant over time among different organisms. Character-Based method uses the aligned sequences directly during tree inference. Distance matrix based method transforms the sequence data into pairwise distances and then uses the matrix during the tree building. Mutations are the gaps present in the alignment which results in evolution. In this paper, a comparison analysis among the existing methods is proposed for finding the best method to construct the Phylogenetic Tree for a closely related species and distantly related species. The methods which are employed here for comparing the group of species in the phylogenetic tree are molecular clock hypothesis, maximum parsimony, maximum likelihood, neighbor joining, UPGMA (unweighted pair group method with arithmetic mean). Many researchers have already applied these methods in their work. Interestingly, our observation of the study matches with their findings for closely related group as well as for distantly related group.

**0521296 MEGHASHREE, G. R AND NARGUND, ACHALA L (P.G. Department of Mathematics and Research Centre in Applied Mathematics, M.E.S College of Arts, Commerce and Science, 15<sup>th</sup> cross, Malleswaram, Bangalore – 560012). A NOTE ON ONSET OF BENARD - MARANGONI FERROCONVECTION WITH BASIC EQUATIONS**

A review has been done on an Onset of Benard - Marangoni ferroconvection where the lower rigid surface and the upper horizontal free boundary is open to the atmosphere and are considered to be perfectly insulated to temperature perturbation by considering the various factors such as presence of magnetic field viscosity, temperature dependent viscosity, internal heat generation and the effect of coriolis force in a rotating ferrofluid layer with Magnetic Field Dependent viscosity. The study reveals that presence of the above parameter by considering the combined buoyancy and surface tension forces stabilizes or destabilizes the system by considering the critical values of various parameters that is to hasten the onset of ferroconvection.

**Keywords: Ferrofluid, buoyancy , Surface tension , coriolis force, Biot number, non linearity of fluid magnetization , Magnetic number.**

**0521297 MISHRA, GOPABANDHU AND PANIGRAHI, ARCHANA (Utkal University, Bhubaneswar). ESTIMATION OF AN UNBIASED ESTIMATOR OFFINITE POPULATION VARIANCE IN PRESENCE OF AUXILIARY INFORMATION**

In theory of sampling from finite populations attention of the survey practitioners and research workers usually been centered around the estimation of population mean or population total. The population mean and total are the simplest parametric function met in practice. However, there are other parametric functions like variance, coefficient of variation, correlation coefficient, regression coefficients etc. sometimes we need to estimate. Variance may be estimated with a view to get an idea about the variability of existing in the population. Above knowledge is of vital importance for future surveys which advocate for stratification. The knowledge of variance helps to determine the sample size. If variance is not known we need to estimate it.

In 1951 Evans has given some preliminary thoughts to derive an estimator to estimate population variance. In 1953 Hansen, Hurwitz and Madow also made some attempts to estimate population variance under SRSWOR. Wakimoto (1970,1971) had discussed the estimation population variance under stratified random sampling. In 1974 an explanatory attempt was made by Liu to provide theoretical formulation for the estimation of variance. Following Horvitz and Thomson (1952) , Liu(1974) made an exploratory attempt to provide a theoretical formulation for the variance estimation under unequal probability scheme. Choudhury (1978) has suggested an improved estimator of finite population variance under unequal probability scheme. Mishra (1990) suggested and discussed different type of estimators on estimation of variance. Swain and Mishra (1994) developed some estimators of population variance under unequal probability scheme. Singh *et. al.* (2011) developed an exponential estimator to estimate population variance. Further works are made by Yadav *et. al.* (2013), Asghar *et. al.* (2014) and many others.

An unbiased estimator of population variance is developed in presence of auxiliary information i.e the known population variance of auxiliary variable. It is assumed that the coefficient of correlation between study variable and auxiliary variable is highly positive. This estimator is compared with estimator population variance when auxiliary information not present, ratio estimator and regression estimator developed by Isaki (1981). The suggested estimator is unbiased and efficient than the estimators mention above.

**0521298 NARGUND, ACHALA L (P.G. Department of Mathematics and Research Centre in Applied Mathematics, M.E.S College of Arts, Commerce and Science,15<sup>th</sup> cross, Malleswaram, Bangalore-560012). ALFVEN INERTIAL INTERNAL GRAVITY WAVES PROPAGATING IN AN EXPONENTIALLY STRATIFIED INCOMPRESSIBLE AND INFINITELY CONDUCTING FLUID**

Density stratification and gravity play important role in wave generation in nonhomogeneous fluid. Gravity waves in homogeneous fluid exist only when there is a free surface, which is nothing but surface fluid discontinuity, i. e density stratification. Gravity acts as restoring force if there exist density stratification, which in turn leads to oscillations. For an incompressible fluid to be stable if the density of displaced fluid whose position is lower than old is greater and unstable if it is lesser. Thus oscillation or wave motion is possible only if the stratification is statically stable i.e density decreases with height. For stability of compressible fluid entropy decreases with elevation and wave motion exists only in stably stratified fluid.

In this paper we have analyzed the effect of rotation and magnetic field on linear and nonlinear internal gravity waves called Alfven inertial internal gravity waves propagating in an exponentially stratified incompressible and infinitely conducting fluid. The problem is governed by nine nonlinear inhomogeneous PDE's which has been reduced to third order ODE's by using traveling wave solutions and some first integrals. The resulting system is analysed in Phase-plane. We have solved the same system by Rank matrix method. The Rank matrix gives us new solutions which are not obtained by Achala [ 2001]. We have also applied numerical method called Runge-Kutta-Merson to solve the problem.

**Keywords: travelling wave, rotating stratified fluid, inhomogeneous systems, phase function, internal gravity waves, Rank matrix method.**

**0521299 PANDA, MADHUMITA AND DASH, SUJATA (Department of Computer Application, North Orissa University, Baripada, Odisha). A HYBRID JAYA-DE METAHEURISTIC APPROACH FOR MODEL BASED TESTING OF OBJECT ORIENTED PROGRAMMES**

Nowadays object oriented programming approach is quite popular in the software project development platform. Starting from banking, stock market, telecommunication, internet applications, mobile apps, graphics to artificial intelligence, everywhere we found widespread use of object oriented programming. The object oriented programming is popular for its specific features like abstraction, inheritance, encapsulation and polymorphism etc., these features help in data security as well as easy of reusability. In the mean time the features that make the object oriented programmes most popular from the developer's point of view; the same features make those programmes most complex for the testing community. Therefore, instead of conventional testing approach the object oriented programmes are tested using model based testing approach. The UML models are the most suitable representations and widely used models by the software research community for deriving test cases since last decade. Like conventional approaches the model based testing approaches are also not always capable of suggesting exact optimized and prioritize test cases, thus some popular metaheuristic algorithms and a few hybrid metaheuristic algorithms are gradually fabricated with model based testing methodologies for solving this problem. Keeping in view the above described issues in model based object oriented testing process, we propose a hybrid metaheuristic Jaya-DE algorithm fusing the best features of recently introduced Jaya and already popular differential evolution algorithm. The Jaya algorithm is a parameter free algorithm and the differential evolution algorithm is mainly based on the mutation operator. The results on experimentation with some bench mark problems show good results in comparison with some popular hybrid algorithms.

**0521300 PANI, SUBHENDU KUMAR (Department of Computer Science, Orissa Engineering College, Bhubaneswar, Odisha). PREDICTIVE MODELING FOR HEALTHCARE DATA ANALYSIS THROUGH DATA MINING TECHNIQUES**

This research is an attempt to highlight the data analytics in medicine and healthcare. Data analytics in medicine and healthcare covers integration and analysis of huge amount of complex heterogeneous data such as different data like epigenomics, genomics, transcriptomics, interactomics, proteomics, metabolomics, , pharmacogenomics, diseasomics, biomedical data and electronic health records data. To get the best services and care for the patients, healthcare sectors in many countries have projected different models of healthcare information systems. These models for predictive, personalized, participatory and preventive medicine rely on using of electronic health records (EHRs) and vast amounts of complex biomedical data. The healthcare industry collects a huge amount of data which is not properly mined and not put to the optimum use. Discovery of these hidden patterns and relationships often goes unexploited. The basic objective of Health Informatics is to get in real world medical data from all levels of human existence to assist advance our understanding of medicine and medical practice. Data mining tools and approaches for the analysis of Health Informatics data to be gathered at multiple levels, including the tissue, molecular, patient, and population levels. Additionally, to gather data at multiple levels, multiple levels of questions are addressed: human-scale biology, clinical-scale, and epidemic-scale. The healthcare sector has observed a huge evolution following the development of novel computer technologies, and that pushed this area to generate more medical data, which leads to multiple fields of research. More efforts are done to deal with the explosion of medical data on one hand, and to get useful knowledge from it on the other hand. This encouraged researchers to implement all the technical innovations like predictive analytics, big data analytics, machine learning and learning algorithms in order to extract useful knowledge and assist in decisions making process. Due to the enhancement of predictive analytics in big data, and the use of machine learning algorithms, predicting future is no longer a hard task, particularly for medicine because predicting diseases and anticipating the cure became possible.

**0521301 PATRA, BICHITRANANDA AND DASH, SUJATA (Department of Computer Science and Engineering, SOA University, Bhubaneswar). AN INNOVATIVE IOT AND CLOUD COMPUTING BASED HEALTH MONITORING SYSTEM WITH THE AID OF MACHINE LEARNING APPROACH**

In order to improve clinical outcomes, real-time measurement and management of illnesses are considered as important features. Providing a better quality of life and user experience to patients is critical to enhancing patient care. IoT in Medical Devices promises a cost-effective way to achieve the goals of the healthcare industry. Connected healthcare programs utilize unusual resources to provide an improved quality of care which leads to better clinical outcomes. Measurable benefits of connected medical devices include reduction in mortality rates, fewer clinic visits, reduced emergency and hospital admissions, including reduction in bed days of care and length of stay in hospitals. Remote monitoring of patients leads to more effective and timely treatment and also it leads to a better management of healthcare.

The IoT devices gather patient information from time to time and perform the required processing to provide the information to the patient as well as the doctor/care takers. When addressing such global health issues, one has to provide an end-to-end solution which is cost effective and lasts over a period of time. Bearing all the required features in mind a new non-invasive solution is proposed to monitor long-suffering people in real-time.

It is possible for health providers to monitor a patient's health remotely using actuator, sensors and mobile communication devices. Patient's data is monitored by transmitting into a secure cloud based platforms for storage, aggregation and analytics. The electronic devices i.e. a smart neck band, smart wrist band and smart socks which is available in the market helps us for track the food intake, heart rate, skin moisture, ambient temperature, walking patterns and weight gain or loss. The devices with the aid of controllers send all the sensor values as a packet via Bluetooth to the mobile app.

Future work might show that improving security by implementing advanced user authentication schemes, save the data in the cloud and with the help of machine learning algorithm, we have to predict the change in patient's status and alert the patients. We also check its accuracy through approximation algorithm.

It will benefit the patients for fewer clinic visits, reduced hospital admissions. it will helps them to a better management of healthcare.

**0521302 RAO, YERRA SHANKAR AND PANDA, TARINI CHARAN (Department of Mathematics, Gandhi Institute of Excellent Technocrats Ghanagapatana, Bhubaneswar). A DYNAMIC MODEL ON PRE-QUARNATINE DEFENCE AGAINST THE WORM IN COMPUTER NETWORK**

Malware is currently one of the main threats to wireless sensor networks. A wireless sensor network becomes unstable due to the presence of malicious signals. Therefore, for controlling malware propagation in wireless sensor networks, a mathematical model is developed which proposes the pre-quarantining of nodes in networks. The e-epidemic model, namely, e-SQIQ<sub>1</sub>R (electronic- Susceptible, pre quarantine, infectious, quarantine, recovered) has been introduced to restrict the spread of malicious signals in wireless sensor networks. The basic reproduction number ( $R_0$ ) and  $R_0^Q$  have been derived. The equilibrium, local as well as global stability of the models have also been derived. The value of basic reproduction number decides the stability of the network. If this value is less than unity, the network system exists free from malware; otherwise it exists in an infected state. The systems of equations are solved by numerical methods, and MATLAB is used to produce computer models of the system of equations so as to visualize the dynamic behaviour of the models. Also, the effect of some influential parameters of wireless sensor networks is properly executed to remove the disturbances from the network.

**0521303 REKHA K; REDDY, N. BHASKAR AND NARGUND, ACHALA L (P. G. Dept of Mathematics and Research Centre in Applied Mathematics, M. E. S. College of Arts, Commerce and Science, 15<sup>th</sup> cross, Malleshwaram, Bangalore-560003). HOMOTOPY ANALYSIS METHOD FOR NONLINEAR BOUNDARY VALUE PROBLEM**

Magnetohydrodynamic (MHD) flows have applications in meteorology, solar physics, cosmic fluid dynamics, astrophysics, geophysics and in the motion of earth's core. In addition from the technological point of view, MHD free convection flows have significant applications in the field of stellar and planetary magnetospheres, aeronautical plasma flows, chemical engineering and electronics. The object of the present paper is, "the study of

MHD effects on a free convection boundary layer flow past a semi-infinite moving vertical plate embedded in a porous medium". The governing equations are transformed by using similarity transformation and the resultant dimensionless equations are solved numerically using Homotopy Analysis Method. The effects of various governing parameters on the velocity, temperature, concentration, skin-friction coefficient, Nusselt number and Sherwood number are analyzed in detail.

**Keywords:** Homotopy analysis method, Heat and mass transfer, skin-friction, Nusselt number, Sherwood number.

**0521304 SREENIVASULU, P.; POORNIMA, T. AND REDDY, N. BHASKAR (Department of Humanities and Sciences, SVEC, Tirupati). INFLUENCE OF JOULE HEATING AND NON-LINEAR RADIATION ON JEFFREY NANOFLUID FLOW PAST : A STRETCHING SHEET WITH CONVECTIVE BOUNDARY CONDITIONS**

This study focuses on the effects of non-linear radiation and Joule heating on MHD three-dimensional laminar flow of a viscous incompressible dissipating Jeffrey nanofluid past a stretching sheet in the presence of convective surface conditions. The governing nonlinear partial differential equations are transformed into a system of non-linear coupled ordinary differential equations by similarity transformations and then solved by employing shooting method. The effects of the flow parameters on the velocity, temperature and concentration as well as the skin friction coefficient, Nusselt number and Sherwood number near the wall are computed for various values of the fluid properties and discussed in detail.

**Keywords:** Thermal radiation, Magnetic field, Jeffrey fluid, Nanofluid, Viscous dissipation, Joule heating, Stretching sheet, three dimensional flow.

**0521305 SUGUNA, M S AND NARGUND, ACHALA L (P. G. Department of Mathematics and Research Centre in Applied Mathematics, M.E.S. College of Arts, Commerce and Science, 15<sup>th</sup> cross, Malleswaram, Bangalore-560012). NUMERICAL SOLUTION OF NONLINEAR BOUNDARY VALUE PROBLEMS**

The Finite Difference Method (FDM) is one of the methods used to solve differential equations that are difficult or impossible to solve analytically. This method can be applied to linear and nonlinear, time independent and dependent problems. FDM uses an approximation of the differential of the differential equation and hence is known as a differential approximation. FDM converts a linear or nonlinear ordinary differential equation (ODE) or partial differential equations (PDE) into a system of difference equations that can be solved by matrix algebra techniques. FDM is widely used in modern numerical analysis and is one of the most dominant approaches to numerical solutions of PDE. In this paper, we have applied FDM to solve systems of nonlinear boundary value problems for ODE. The difference equations are then solved using successive iteration method and Newton method. The obtained results are compared with the exact solution, which are found to be in good agreement. We observe that the truncation error is very small in FDM. The applications, advantages and disadvantages of FDM are discussed.

**0521306 SWAPNA, SANGEETHA P (Department Of Mathematics, Bengaluru Central University, Bengaluru-560001). THE FINITE ELEMENT METHOD - THE RAYLEIGH RITZ METHOD**

We solve a nonlinear differential equation i.e., a boundary value problem by approximating the solution with a linear approximation of basis function. We develop a general form of the Ritz Method for trial functions that do not satisfy the essential boundary conditions. We give a brief introduction to Functionals and Variational Formulation. We derive the Ritz Rayleigh Method using a second order linear differential equation, solve linear and nonlinear ordinary differential equations We compare the solution with Collocation Method and analyse them, we also illustrate using Maxima Program, discuss the advantages and limitations of the method, and finally give a conclusion.

**Keywords :- Variational Principle, Variational Identities, Functionals, Trial or Approximate function, Comparison with Collocation Method and Maxima Program.**

**0521307 TYAGI, INDU; RAO, YERRA SHANKAR AND PANDEY, RAJEEV KISHORE (Department of Mathematics, Galgotia College of Engineering and Technology, Greater Noida). EPIDEMIC MODEL ON RUMOR PROPAGATION IN E-COMMERCE**

In the present scenario for business and communications, people are using social network or e-commerce related web sites. Large sector of young population across the globe surfing internet hesitate performing e-commerce. Do cyber attacks and rumor play a vital role in performing e-commerce? An e-epidemic model is developed to understand the transmission dynamics of cyber attacks and rumors in e-commerce. Media awareness for reducing the rumor spread is also introduced as a key parameter in the proposed model. Reproduction number is found out with necessary conditions for the transmission to be an epidemic or not. Poincare-Bendixon property is used to prove the global stability of the system developed. Extensive numerical simulations are performed to establish the analytical results using real parametric values.

**Keywords: Rumor, Cyber Attack, e-Commerce, Epidemic Model, Global Stability**

## 22. MEDICAL AND HEALTH SCIENCE

### **0522308 BHOWMIK, MUKUT (Public Health Foundation of India, Registered office –Saket, New Delhi). HIV/AIDS – PAST, PRESENT AND WAY FORWARD**

HIV/AIDS, which was considered a virtual death sentence just few decades ago is now a chronic and manageable disease. India currently, has low HIV prevalence of 0.22 %. The country's epidemic is epicentred among high-risk groups which comprises of female sex workers (FSW), transgenders (TG), men having sex with men (MSM) and injecting drug users (IDU), and is heterogeneously distributed with wide geographic variations in the vulnerabilities that drive the epidemic. With low prevalence, in terms of absolute numbers, India has the third highest burden of HIV in the world with an estimated 2.14 million people living with HIV, 87,000 estimated new infections and 69,000 AIDS-related deaths annually.

In the year 1986, India identified its first case of HIV, and since then the Government of India (GOI) has achieved many remarkable milestones in the field of HIV/AIDS care with the help of strong political commitment, active engagement with the civil society and network of positive people and partner agencies. Over the years with four phases of National AIDS Control Programme (NACP), India was able to reverse the epidemic in most parts of the country with 80% reduction in the estimated incidences of new infections since 1995 (global decline is 47%) and 71% decline in the number of AIDS related deaths since 2005 (global average 51%).

NACP under Ministry of Health and Family Welfare, GOI has evolved in years and is committed to work, along with universal access to comprehensive, equitable, stigma-free care support and treatment services along with standard psycho social support. This has resulted into adoption of Test and Treat policy, HIV/AIDS Prevention and Control Act, simpler and safer regimens of Anti-Retroviral medicines, routine viral load monitoring and differentiated care service delivery model. The programme is providing free ART since April 2004 and has scaled it up significantly since then. Currently, more than 12 lakh people living with HIV are availing standard HIV care through 540 ART centres and 1100 Link ART centres across the country.

India is committed to achieve '90-90-90' by 2020 which means, 90% of people living with HIV will know their HIV status, 90% of people who know their HIV-positive status will be accessing treatment and 90% of people on treatment will have suppressed viral loads. As per 2017 UNAIDS data 79% of people living with HIV knew their status and 56% of people living with HIV were on treatment. Virally suppressed data for the year 2017 was yet to get accumulated but currently the numbers have changed and the country is on its way to achieve the commitment. In 2020, the country has also committed to attain Elimination of parent to child transmission of HIV and Syphilis (EMTCT) for which both public and private sector is working hand in hand. By 2030, 'End of AIDS' is what India aims along with the world commitment to fight AIDS and ensure no death is caused due to it.

With break-through in HIV medicine with the science of Undetectable equals to Untransmittable (U=U) and usage of PreP (Pre-exposure Prophylaxis) the change in looking towards HIV has started evolving in today's time and with international organizations such as World Health Organization (WHO) and UNAIDS promoting them, has taken a strong stand in the current scenario to fight against the discrimination towards HIV/AIDS. Injectable ARTs and vaccines being under trial, gene therapy declaring HIV remission this year in a patient at London (termed as London Patient) has brought an evolution to foresee in the science with a hope that cure for this epidemic will be nearing in the future. Communities had been working closely all these years to fight HIV/AIDS and with this confluence this epidemic will be curbed and the world will make a history of its own battle with this virus.

### **0522309 GOWTHAMI, P (DAKSH skill lab, National Health Mission, New Delhi). ELIMINATION OF MOTHER TO CHILD TRANSMISSION OF HIV IN INDIA -A WAY FORWARD FOR HIV FREE GENERATION.**

India ranks third globally, in the number of HIV infections. Over the last two phases of the National AIDS Control Program (NACP-III and NACP-IV), the country has made significant progress in reducing new HIV infections and expanding care-continuum services for People Living with HIV (PLHIV). However, India's HIV/AIDS National Strategic Plan (NSP: 2017-24) has identified significant gaps in counselling and testing, positive detection, ART initiation, and early infant diagnosis, in order to achieve mother to child transmission of HIV and Syphilis by 2020.

In 2016-17, about 54% of the 30.1 million estimated pregnant women were reached with HIV counselling and testing services. The burden of HIV positive pregnant women is estimated to be 22,677 (estimation for 2017); however, only 39% of them were identified by the program. Close to 96% of the 13,707 positive pregnant women were initiated on antiretroviral therapy (ART) and uptake of early infant diagnosis (EID) was 57% (6,185 out of 10,775 live births) for first EID within 2 months.

India is a signatory for ambitious goal of Elimination of Mother to Child Transmission of HIV and Syphilis by December 2020, given the current gaps and dynamics of disease transmission this goal seems far from achievable. However extensive work that is being undertaken with innovative strategies in the field aims at accelerating India's progress towards the goals of: a) Elimination of Mother to Child Transmission of HIV (EMTCT) and keeping their mothers alive; and b) initiating and retaining PLHIV in care cascade for sustained viral suppression (second and third of the UNAIDS 90-90-90 goals).

**0522310 GUJARATI, VIDHEE L (Electronics and communication Engineering, Dr Ambedkar Institute of Technology, Bangalore). ROLE OF INTERNET OF THINGS IN THE HEALTH CARE SYSTEM: A REVIEW**

Internet of Things has played a vital role in many industries. Be it food industries, chemical industries or Health care systems, automobile industries and many other industries. This paper focuses on the role of Internet of Things in Health care System. Growing population of our country is raising the demand of improvement of the facilities, technologies and the overall efficiency in the health care system. The growing population has led to the requirement of the resources like, skilled doctors, nursing facilities, beds, and other equipments required to treat the patients. In rural areas, due to the lack of hospitals and proper health care facilities, many people are losing their lives. One of the important reasons for the loss of life of people in rural areas is the lack of timely treatment given to the patients. Therefore, to bring a solution for these and to meet the increasing demands of improvement in health care systems, researches are done. IOT is one of the effective solutions for the improvement of health care systems. IOT helps in the real time monitoring of the patients, identifying the problems and providing a quality solution in a much faster time. Therefore, it reduces the dependency of the people on doctors and going to hospitals.

This paper comprises of various technologies developed from the Internet of Things, and it also consists of a survey, which tells the number of hospitals that have modern medical devices, the number of people that are using IOT based medical devices at their homes, so that it helps them at the time of any medical emergency. The survey also focuses on the quality of health care facilities in rural areas, The satisfaction of the people towards the health care facilities, cleanliness of the hospital, people's opinion towards the skills and competency of the staff present in the hospital, Efficiency of the Nursing care provided in the hospitals, Convenience of the location of the hospitals, Knowledge of the people about the usage of the modern medical devices and their suggestions for the improvement of the health care systems.

Some of the challenges that are faced while using IOT based health care systems are: Security attacks on the patient's personal information, privacy concerns. Information security using IOT becomes a difficult task to handle. Some of the solutions that could help in overcoming these problems are discussed.

Technologies like fall detection system for elderly people and physically disabled people, Real time monitoring of heart rate, blood pressure and body temperature of the patients using a cost effective technology. Identification of technology, Communication technology, Location technology, Sensing technologies, Monitoring of



glucose level, Monitoring of Electro cardiogram. Wheel chair management. Thus IOT enables Efficient, low cost and effective solution to the health care systems.

**0522311 KARIKALAN, N. AND BAGAVANDAS, M (Department of Health Economics, National Institute for Research in, Tuberculosis, Indian Council of Medical Research, Chennai). A STUDY OF INFLUENCE OF SOCIAL NETWORKS ON CARE SEEKING BEHAVIOUR, TREATMENT ADHERENCE AND OUTCOMES OF TUBERCULOSIS PATIENTS IN INDIA**

Poor treatment adherence increases the risk of morbidity and mortality of Tuberculosis (TB) patients. Risky psycho-social and poor economic status of TB patients are attributed for this. Present evidences couldn't explain why certain TB patients from the same resource poor setting and risky environments successfully adhere for treatment.

An ego-centric personal social network survey was conducted in Chennai to measure social network structure of TB patients (n=342) who had differential treatment adherence and outcomes. Social network metrics and graphs were generated. Logistic regression was used.

This findings highlights that there are notable differences in the social network structure and functions of TB patients which in turn influenced the treatment adherence directly and treatment outcomes indirectly. Network centrality measures and network size were notably different between patients with poor and regular adherence. Psychological and practical supports received by patients from their network members during treatment period had significant impact on patients regular adherence. Social networks of TB patients influences the treatment seeking behaviours and adherence of patients.

**0522312 MUKHOPADHYAY, AMITA (.....). A COMMUNITY-BASED STUDY OF MILK ADULTERATION AND ITS CORRELATION WITH MALNUTRITION IN CHILDREN AGED 1-5 YEARS IN A SELECTED AREA OF BANGALORE RURAL DISTRICT**

Malnutrition and milk adulteration are widely prevalent challenges in Indian society. Milk is a key component of the diet of young children, and the source of many vital nutrients. Thus, milk adulteration has the potential of causing serious harm to young children, including malnourishment and systemic diseases. In view of these concerns, we carried out a study of the prevalence of malnutrition in children aged 1-5 years, and milk adulteration at the household level, in a selected population of the rural health service area of a medical teaching institute.

We assessed malnourishment using WHO CGS indicators, and tested milk samples for adulteration using strip tests developed through technology transfer from National Dairy Research Institute (NDRI). We studied 180 children (91 girls, mean age 29.37±13.72 months).

The overall prevalence of underweight/ undernutrition, stunting, wasting and low BMI was 13.33%, 38.33%, 15.0% and 26.7% respectively, with boys affected in higher proportions than girls. We found 158 out of 180 milk samples (87.8%), to be adulterated, with neutralizers being the commonest adulterants (97, 53.9%) followed by maltodextrin (90, 50%), hydrogen peroxide (55, 30.6%) and water (47, 26.1%). We noted a higher proportion of stunting, underweight and low BMI in the children drinking adulterated milk compared to those who drank milk without any detectable adulterants, although our results were not found to be statistically significant. Malnutrition was significantly associated with joint family and poor maternal education.

Research and policy actions are warranted to understand and rectify the higher prevalence of malnutrition in male children. We recommend further research with large sample size and quantitative assay in order to obtain a clearer picture of the association and dose response relationship between milk adulteration and malnutrition.

**0522313 NAVYA, SRI S (FA 902, Golden Grand Apartment, Yeshwanthpur Industrial Area Phase 1, Opposite To ICICI Bank, Yeshwanthpur, Bangalore). AGEING DEPRESSION: A CROSS SECTIONAL STUDY IN AN URBAN SLUM**

Ageing is an inevitable, progressive physiological process leading to universal deterioration in physical, mental, behavioural and biomedical systems. The factors leading to this increase is progressive reduction in fertility and mortality and added life span with increased survival chances. From morbidity point of view at least 50% of the elderly have chronic diseases. Geriatric population though susceptible to many maladies in particularly they are highly vulnerable for depressive vagaries. From public health view it is very much important to document the magnitude and the factors leading to depression among elderly. Hence this study is done to find the prevalence of depression among elderly and its associated factors in urban slum of Bangalore.

A community based cross sectional study was conducted among 665 elderly in urban field practice area of Bangalore Medical College and Research Institute. Study was conducted by probability proportionate sampling. Every house is visited and data was collected until the desired sample is reached from the slum.

In the present study, out of 665 elderly, 35.4% (236) were males and about 64.5% (429) were females. The mean age of elderly was  $68.9 \pm 7.9$  years. About 55.49% (369) were Muslim by religion. Majority belonged to III generation. As per Modified Kuppuswamy Socio-Economic Scale, 91.13% (606) of the study respondents belong to upper lower Class. Out of 665 respondents, 34.74% (231) had a single morbidity and about 31.74% (211) had co morbidities. As per Geriatric depression scale 48.27% of elderly are found to have depression. 8.42% of the study subjects have severe depression.

Depression is associated with chronic morbidity. Geriatric morbidities should be early diagnosed and proper treatment should be given. Findings show the need for proper care by the family members and counselling for the elderly which are of much importance in preventing depression.

**Keywords: Aging, depression, morbidity.**

**0522314 PRIYA, HARI (.....). EXPERIENCE OF MORTUARY STAFFS AT THE TIME OF NIPAH IN KERALA**

Mortuaries are popularly associated with the tales of inspiring horror and fear. For people working in morgue, their primary means if duty is storage of dead bodies, cleaning bodies before cremation and as a secondary work they assist the forensic surgeons in post mortem in extracting organs out, cleaning and stitching back .The outbreak of nipah in Kerala at 2018, sprouting from soopikkada village, changarothu gram panchayat in Perambra taluk at Kozhikode district was a delirious zoonotic disease. Keralites, the medical professionals and a group of medical assistants including mortuary staffs has faced such a panic attack. The objective of study is to en- route the experience of them as a mortuary worker from, very beginning to the time of nipah and their present situation .This study encompasses on many direct and indirect factors affecting the life of mortuary staffs and their reaction to such sudden violent epidemic outbreaks. 15 mortuary staffs who witnessed nipah in Govt.Medical College Kozhikode are the samples included.

**Key words: mortuary, mortuary staffs, nipah, job satisfaction**

**0522315 QUTAB, SAHANA (School of Management, IILM University, Sector 53, Gurugram, Haryana).TRENDS IN HEALTH INSURANCE ADOPTION BY RURAL POOR POPULATION OF INDIA AND THE SOCIAL INTERVENTIONS – A REVIEW.**

The review paper analyses trends in adoption of health insurance and healthcare by the rural poor population of India. Existence of health insurance is a vital step towards achieving universal healthcare and health coverage. Health is a luxury for many in India especially in the far-flung rural regions of the country fraught with poverty. Health is also an important indicator of economic and social development of a nation. Many schemes and

initiatives of government, NGOs, civil society and others, for propagation of health for all, are important steps in improving overall health quotient in India. Health insurance is one such initiative that improves the health standards of the people especially those belonging to the poor and marginalised. It limits or removes direct financial burden on healthcare consumers. The present paper was written based on exhaustive review of literature that covered past and present scenario of healthcare and health insurance schemes including Pradhan Mantri Jan Arogya Yojana (PMJAY) also known as Ayushman Bharat Health Insurance Scheme. Prevalent trends that were highlighted in the literature emphasised the fact that health insurance awareness is less among the poor and rural population of India. The service delivery of Healthcare and health insurance is lacking overall. The literature also highlighted that targeted community awareness campaigns with regards to health insurance positively affected the healthcare utilisation of rural population. More significantly, healthcare of females among the rural poor showed positive improvement by adoption of health insurance. To conclude, the review of literature stressed on the importance of health insurance in India for bringing equity in healthcare. Community interventions and awareness campaigns need to be designed and implemented strategically, keeping in mind the needs, beliefs and social behaviours of the targeted community. Improvement of service delivery of social and developmental initiatives in healthcare, especially health insurance, will generate long lasting positive social behaviours, benefitting the community and nation.

**Key words: Healthcare, health insurance, awareness, social behaviours, development communication, PMJAY.**

**0522316 RAMESHKUMAR, KARUNA (St. John's medical college, Pathologist, Rainbow, children's hospital, Bangalore). INFLAMMATION AND MALARIA – UPDATE AND APPLICATIONS**

The magnitude and the timing of inflammatory responses to the malarial parasite represent the key to the successful resolution of an infection. The cells which mediate inflammatory response include monocyte/macrophages, natural killer (NK) cells, neutrophils, dendritic cells (DCs) and certain T cell subsets. They are activated by the presence of the parasite and respond by secreting cytokines and chemokines. Many receptors are involved in the interaction between the inflammatory cells and the parasite. The study on the platelets which showed strong correlation between platelet count and CD 36 antigen expression indicated the central role played by the platelets through mediation of inflammatory processes which can influence the severity of malaria. The parasite has a complex life cycle in which it undergoes several transformations. Early and robust inflammatory responses against the parasite are important for control of parasite replication and protection from severe malaria.

**0522317 RAO, CHYTHRA R (Kasturba Medical College, Manipal Academy of Higher Education, Manipal). CHALLENGES IN ENSURING TREATMENT ADHERENCE AMONG TYPE 2 DIABETES MELLITUS PATIENTS**

The cross-sectional community-based survey was carried out among men and women aged 30 years and above in the field practice area of a medical college to assess treatment compliance with respect to hypertension and type 2 diabetes mellitus. The study comprised of 426 subjects, already diagnosed with hypertension (287) and type 2 diabetes mellitus (139). During house visits, data were collected by personal face-to-face interview using a pre-tested structured questionnaire. Compliance was determined by indirect methods, which included self-reporting and interviews with the patients. Compliance to hypertension treatment was found to be 82.2%, while 83.6% of individuals with type 2 diabetes mellitus were on regular medication. Among the individuals on regular medication, 88 (37.3%) of them had controlled blood pressure.

Although the compliance was good, blood pressure control was not optimal. Adherence was better among females as compared with males. Literacy status and socio-economic background were not found to be associated with treatment compliance. High cost of treatment for hypertension (39.3%) and diabetes (30.4%) and asymptomatic nature of the disease were the most common reasons cited for not taking regular medications.

**0522318 ROY, NIBEDITA (Centre for Social Medicine and Community Health, Jawaharlal Nehru University, New Delhi). LIVED EXPERIENCE OF FEMALE SEX WORKERS IN SONAGACHI, KOLKATA: A STUDY OF THEIR SOCIAL DETERMINANTS OF THE HEALTH**

The “problem” of sex workers and their health is situated at the nexus of different competing perspectives and moral paradigms that define their health priorities for sex workers in research and policy. Sex workers’ own perspectives are hardly given its due importance in analysing the issue, thus, contributing to research and policy which silences sex workers’ priorities. With the advent of HIV/AIDs epidemic, Sonagachi, the Red Light Area (RLA) of Kolkata, became the first place where the HIV/AIDs intervention started and sustained for more than two decades. It’s to uncover how the intervention has shaped the lives of the sex workers.

While HIV/AIDs among the sex-workers has been identified as a serious occupational health problem for them, there may be other issues related to their overall wellbeing which needs to be explored. With this backdrop, the study attempts to understand the construction of social determinants of health from the perception of the female sex workers (FSW).

The methodology for the primary field work rested within the qualitative research paradigm. Using chain referral sampling, 30 FSWs and a few other stakeholders are selected as research participants. From the in-depth interviews, personal narrative analysis are done to develop themes.

The findings of the study revolves around the following themes viz., income, wealth and assets; nutrition; employment and livelihood activities; education; access to services and amenities; stigma, agency; resilience, dignity and social networks. Thus, it was found that the experience of social determinants of health among the sex workers involve complex interaction of these factors. The study has the potential to contribute in the overall understanding of wellbeing among the vulnerable community.

**0522319 SUMAIYA, SYEDA AND BEGUM, WAJEEHA (Department of OBG, NIUM Bengaluru). EFFECT OF HABBULGHAR AND MAUL ASAL IN PRIMARY DYSMENORRHEA-A CASE REPORT**

Dysmenorrhea is the most common gynecological complain affecting 50% of women in which 20-90% female adolescents experience primary dysmenorrhea and in 10-15% leads to incapacitation of day to day activities. In adolescents and adult’s dysmenorrhea is usually primary and is associated with normal ovulatory cycles. Primary dysmenorrhea is painful menstrual cramps without any evident pathology. It is caused by an excessive imbalance amount of prostamides released from the endometrium during menstruation, these prostamides cause the uterus to contract frequently and dysrhythmically causing decrease blood flow and hyperstimulation of peripheral nerves. Pain is suprapubic, crampy, spasmodic, may radiate to back and inner aspect of thighs. Nausea, vomiting, headache, diarrhea are frequent accompanying symptoms. As per unani concept usre-tams is due to sudda, sue-mizajmuqtalif, riyahghaliza. Unani system of medicine the basic principle of treatment of usre tams is using several drugs possessing the properties of mudir-e-haiz, mufattih-e-sudad, musakkin, mulattif which are easily available, efficacious, cost effective, safe and based on evidence of their prolonged successful usage on human beings. Therefore, it is the need of present era to evaluate the effect of Unani drugs for darde- rehman on the scientific basis and modern parameters. Considering all these facts Habbul-Ghar and Maul Asal was been selected to evaluate the efficacy in the management of primary dysmenorrhea. Habbul-Ghar in a dose of 4.5gm 2 tablet along with Maul Asal 60ml TID was administered orally. Aim of the study was to evaluate the efficacy of Habbul-Ghar in alleviating the symptoms of primary dysmenorrhea by using visual analogue scale (VAS) and verbal multidimensional scoring system (VMSS) for pain. Details with case report will be presented in full length presentation.

**Key words: Dysmenorrhoea, Darderahim, Habulghar, Maul asal**

### 23. PHILOSOPHY

**0523320 BEHERA, TANAVI (Department of Philosophy, Faculty of Arts, University of Delhi, New Delhi).  
FEASIBILITY OF GLOBAL GOVERNANCE TO SOLVE GLOBAL ISSUES**

World is one, problems are many confronting all alike. Problem demands development and development helps eradicating problems. Instrument that is required to implement developmental activities is being called as governance. And governance is the job of a government or a group of governments. Globalization creates situations that call for Global governance. In this paper, the researcher has begun by explaining what governance exactly means and the various types of governance that works at different levels. Though there are so many organizations working towards different agenda, the success rate is not quite impressive.

**0523321 CHAKRABARTY, MANJARI (Department Of Philosophy And Comparative Religion, Visva Bharati, West Bengal) EPISTEMIC COMPLEXITY AND PREHISTORIC STONE ARTEFACTS**

In his 1997 paper “Technology and Complexity” Dasgupta draws a distinction between *systematic* and *epistemic complexity*. Following Herbert Simon (1962), he calls entities *systematically complex* when they are composed of a large number of parts that interact in complicated ways. That means even if one knows the properties of the parts one may not be able to infer the behaviour of the system as a whole. In contrast, epistemic complexity consists of the knowledge that is used in, and is generated by the making of an artefact. In Dasgupta’s words, epistemic complexity refers to the richness (i.e., the amount, variety, and newness) of the knowledge incorporated in an artefact (Dasgupta 1997:116).

While both natural and artificial things manifest systematic complexity, epistemic complexity is typically characteristic of artificial things or artefacts that are produced or consciously conceived in response to some practical need, want or desire (Dasgupta 1997:114). What is worth noting, systematic and epistemic complexities are not necessarily coupled (Dasgupta 1997:130), that is, a high level of systematic complexity does not entail a high level of epistemic complexity and vice versa. Prehistoric stone tools, for example, display a unique coupling of systematic simplicity with epistemic complexity.

Dasgupta’s (1997) first-ever description of these systematically simple stone tools as “embodiments of considerable original knowledge” (Dasgupta 1997: 125) has the controversial implication that knowledge can take on material, artefactual forms. The present paper aims to address this provocative issue of whether materially constituted things or artefacts (e.g., tools, machines etc.) bear knowledge by reflecting on the making and use of prehistoric stone artefacts.

The paper has two main sections. The first section engages the metaphysical and epistemological speculations of three philosophers, namely, Popper’s (1972) theory of objective knowledge (intertwined with his three-world metaphysical hypothesis), Baird’s (2004) theory of ‘thing knowledge’ or instrumental epistemology and Dasgupta’s (1996) account of technological knowledge in order to examine the central theme of the paper. Drawing on recent archaeological-prehistorical research the second section enquires into the prehistoric stone tool production known as Oldowan industrial complex and into the particular nature of knowledge embodied in these Oldowan stone tools. The paper ends with a few comments on the epistemic complexity of ancient Oldowan stone artefacts and on its implications for future investigations.

**0523322 DEVI, RAJNEE (Department of Philosophy, Jawaharlal Nehru University, New Delhi-110067).  
UNDERSTANDING THE CONCEPT OF GOOD LIFE IN NON-NARRATIVISTS’ THESIS OF SELF**

In the mid twentieth century the word ‘self’ became a central concept in relation with other concepts such as, self-identity, self-awareness, self-perception, self-control, etc. To understand the concept of self, there are two theses i.e. narrativists and non-narrativists thesis of self. A British analytic philosopher Galen Strawson in his paper *Against Narrativity* argues against the narrativity thesis of the self in contrast to philosophers like Ricoeur,

MacIntyre and Dennett among others who conceive self as narratively constructed. In order to do so he argues against both the common views of narrativists i.e. psychological narrative or descriptive empirical thesis and normative or ethical narrative thesis. According to psychological narrativity thesis a person is psychologically prone to be a narrativist. Such a person experiences his/her life as a whole and the person sees his/her life as a story. On the other hand, according to ethical narrativity thesis, to live a good or meaningful life we should live our life as a narrativist. Strawson argues against both the thesis and holds that neither are we psychologically prone to be a narrativist nor should we be a narrativist to lead a meaningful life.

Further, an ethical narrativist claims that to lead a good life we should understand our life as a whole and for which we need to be a narrativist. However, Strawson argues that a person can live a good life without being a narrativist. For him, there are two types of person one is episodic (those who understand their lives in episodes) and the other is diachronic (those who understand their lives in narrative way or as story telling) and it is the first one that Strawson favours. Similar views can be found in Buddhism. As the Buddhists believe in theory of momentariness; that everything exist in moments and nothing is permanent. They also emphasis on living in the present because they understand human life in moments.

In this paper, first the researcher discusses what constitutes a good life where she argues for non-narrativists position. Narrativists argues, that if a person lives his/her life in episodes how would s/he explain his/her past actions and the consequences which would occur in upcoming future. So, she discusses the solutions provided by non-narrativists of this objection. Further, it is argued that a good life can be lived, if one understands ones life in episodes; this position is also found in Buddhist philosophy when they propose the theory of momentariness.

**0523323 KAR, SARITA (Department of Humanities, Social Studies, IIT Dhanbad). RETHINKING INDIAN VIRTUES: A SOLUTION TO CURRENT ENVIRONMENTAL CHALLENGES**

Indian philosophy is not merely a way of thought but also a way of life and it is rightly pointed out by T M P Mahadevan. Still, critics show their concern about the stand of ethics in Indian philosophy. It is a prevailing belief that ethics finds only a subordinate place in Indian Philosophy. The various reasons given by different critics, some of the reasons are: Indian philosophy deals with the nature of reality and the modes of realizing it, the aim of Indian philosophy is not ethics but beyond ethics. Most importantly critics say that ethics does not find a prominent place in Indian metaphysical texts. Metaphysics, epistemology, ethics and religion are mingled together to serve the philosophical pursuit. Ethics has a notable stand in Indian Philosophy, but it need to be unfolded and attended in a proper way.

Ancient wisdoms need to be explored. We only need the new eyes to perceive those old ideas and to realize their necessity for the new moral problems. The ethics of India needs to be discovered and conceptualized, because its philosophy enriched with many value driven ideas which can provide a path way for modern world to face their recent problem and an incredible future. The main trends of Indian thought which deserve special attention at this critical age, its practical insistence that philosophy is for life and must be lived in all its spheres; its emphasis on the necessity of controlling the body and mind, the necessity of moral purity, to make philosophical truths effective in life; its recognition of the fundamental unity of all beings, and the consciousness that our moral or religious duties are towards all, beyond the boundaries of space and time. Since Veda and Upanisadic period philosophical thoughts of India are more practical in nature and not purely theoretical. It seems to be theoretical but the application of those discussed theories are of more practical relevance in Today's perspective It provides a long list of virtues that must be cultivated to achieve the goal and solve the contemporary moral problems.

**0523324 KUSHWAHA, ANKITA (Department of Philosophy, Jawaharlal Nehru University, New Delhi-110067). THE CONCEPT OF VALUE-BASED SECULARISM IN GANDHI**

The concept of secularism is considered very significant for maintaining peace and harmony in a pluralistic country like India where people of different beliefs, language and culture live together. Secularism is, generally, understood as a separation of state from religion, that is, state should not be involved in any religious

matter and the religion should not be involved in the making of any state's rules and policies. However, Indian form of secularism does not accept 'separation' in this strict sense. The state, sometimes, intervenes in religious matter and religion also, sometimes, influences the making of laws and policies. Therefore, Indian secularism is always criticized as pseudo-secularism.

Secularism in India is based on the idea of *sarva dharma sambhāva* which asserts that every religion is equal and should be treated equally. Gandhi's idea of secularism is based on this idea. For Gandhi religion is a very important aspect of an individual's life and every action must be guided by one's religion. Thus, he maintains that one's political actions must be according to one's religion. He believes that the religion is not separated from the other aspect of one's life. Here, it seems that there is a contradiction. If the religion guides every activities of a individuals' life then how can the separation of state and religion be maintained?

In order to understand how Gandhi maintains both the views without any contradiction, it is important to understand what he means by religion. For him, religion means morality. All the religions, he believes, are one because they teach the same morality. Therefore, he maintains that the common laws of state must be based on the common morality. And by following this common morality the religious conflicts and tensions can be avoided. Thus, in Gandhi's concept of secularism religion plays a very important role. The separation of state and religion cannot be maintained, therefore, it is argued that Gandhi's concept of secularism is actually a pseudo-secularism. However, Bhargava argues that Indian secularism is based on some moral values and principles such as liberty, equality, toleration, peace etc. He also believes that the secular state does not separate religion from public sphere but it maintains a principled-discipline. The paper aims at arguing that Gandhi's concept of secularism is a value-based idea. It contains mainly two values i.e. equality and liberty. He maintains that every religion is equal before the law and every person is free to follow one's own religion and it would not affect one's political life.

In this paper, the idea of secularism (with both Indian and Western meaning) would be discussed. Further, Gandhi's idea of secularism within the framework of Rajeev Bhargava's understanding of Indian secularism would be discuss. For Bhargava, the Indian secularism must be understood as the value-based secularism. Further, it would be argued that Gandhi's idea of secularism is based on mainly two values i.e. liberty and equality and would be argued his idea of secularism must be understood as value-based secularism rather than pseudo-secularism. Then, it is also argued that the ideas of equality, liberty and fraternity which are essential characteristics for democracy is necessarily related to the Gandhi's concept of secularism.

The conceptual analysis method would be followed for discussing the concept of secularism, religion, morality, liberty and equality etc. Also, a comparative study would be done between Gandhi's idea of secularism and Bhargava's value-based secularism.

**0523325 LENKA, PURNIMA AND KAR, SARITA (Department of Humanities and Social Sciences, Indian Institute of Technology (ISM), Dhanbad). APPLYING VIRTUE ETHICS FOR ECONOMIC AND ENVIRONMENTAL HARMONY**

Environmental sustainability is one of the major concerns of present time mainly because of the rapid proliferation of business organizations. For economic development, business organizations excessively use or misuse natural resources that directly harm to environment. The process was started during industrial revolution, as the consequence it disturbed the balance between society, economy and ecology. This paper attempts to bring the knowledge how business organization unknowingly leads to environmental problems and contrasts economic development. Now a day's literature shows that economic development is the cause of increase the environment burdens faster than the population growth. On saying this, it precisely indicates that both economic growth and sustainable environment are equally required for well developing society but not at the cost of one another. Science and technology are not enough to find out the proper solution. It means there is a need of other alternatives to solve the problem, which we suggest in this paper is that the ethical perspective is one of the means. We will try to justify that with a good understanding of virtue ethics, and by applying the different virtues in day to day life will enable business organization to maintain a balance between economic development and environmental harmony.

This paper attempts to identify some of the reason behind environmental degradation. It also trying to justify that a good understanding of ethical theories, and virtue ethics overlong current problems.

**Keywords: environment, virtue, development**

**0523326 MARWAH, PAWAS (Department of Philosophy, University of Delhi, New Delhi-110007). ON THE NATURE OF MORAL DISAGREEMENTS**

Morality is the human attempt to define what is right and wrong about our actions and thoughts, and what is good and bad about our being who we are.

With special reference to Alex Gelfret's and Feldman's concept of "epistemic peer", the paper aims to know, firstly, if epistemic peerhood is consistent and reliable solution to all the questions related to the nature of valid moral disagreement?, and secondly, 'is decent logical understanding and rationality the only prerequisites of a valid moral disagreement?'

**0523327 MAYA, S. (Department of Philosophy, Sree Kerala Varma Colleg, Thrissur, Kerala). INDIAN SOCIO-CULTURAL TRAITS: PERSPETIVES FROM DIASPORA**

A socio-cultural analysis would give a broadened as well as scientific outlook on India and it would be distinctive if looked upon from the Diaspora perspectives. This paper is to make such an inquiry into the aspects of Indian migration to the West. It takes the perspectives of Indians who migrated during 1950s and 60s to Germany, as a case study to make the analysis. The phenomenon called migration and the formation of diasporas are dissected in the preliminary step of this attempt. Migration of people from their native place to other places would essentially give rise to the thoughts on the meanings of the boundaries of nation-states and cultural identities. Reflections on such aspects are analyzed in this study by the excerpts from direct discussions with Indian diaspora living in Germany.

The history of the emergence of the Indian diaspora dates back to ancient time and the evolution of it is traced through the medieval period. There are references that argue ancient Sanskrit texts make it clear that Indians had large-scale interactions with the countries of the ancient world as early as 2000 BC (Ray, 2009 ). The ethnic composition of the Indian diaspora evolved and expanded from the merchant diaspora in the sixteenth century (Levi, 2002). Many dozens of semi-permanent Indian trading colonies existed in Eurasian areas and merchants ventured to travel there, and were adapting to the changing socio-cultural and political situations very easily. According to the references they used to keep away from home for many years for the purpose of trade. The Indian family enterprises that established trade outside the subcontinent were known even in the thirteenth century.

Indian diaspora exists all over the globe nowadays igniting in depth discussion on intercultural linkages. Some studies declare that Indians are financially comfortable in Germany, but they face identity issues. The issues of culture and identity among Indians abroad have grown even amidst the debates on NRI investments. The economic aspects of gain and loss are undoubtedly discussed in the migration studies. But the aspects of gain and loss of culture is included in philosophical analysis in diaspora studies. According to some such studies, the Indian self and the outsider identity seem to be developed and preserved by the Indian diaspora. In the 19th century, Indians who went abroad were obliged to undergo elaborate purification rituals when they returned. Today the problem is identified not as a loss of ritual purity, but as a loss of culture. These cultural traits are meant to constitute morals, manners, language, religion, community feelings and so on. But it is obvious that there would be some gain in cultural aspects too when people are exposed to a foreign culture. This study proposes to understand this kind of a 'give and take' of socio-cultural traits between Indians and Germans through the perspectives shared by Diasporas of Indian origin.

**0523328 PAUL, GOPAL (Department of Philosophy and Comparative Religion, Visva-Bharati University, Santiniketan, West Benga). THE ROLE OF LANGUAGE IN NATURE - HUMAN BASED SOCIETY: A PHILOSOPHICAL INSIGHT OF WITTGENSTEIN**



There can be no doubt that we live in a nature- human based society where language is central to social interaction in every society, regardless of place and time period. Language is thoroughly a social phenomenon and man is inherently a social being. Man is defined by Aristotle as a rational animal. He thinks that human thinking is implicit speech. Language, thus, is an essential dimension of human existence. As language is fundamental in building and encouraging social interaction among the people, society becomes the base of any such linguistic practice by its members. Here, in this paper we will highlight Wittgenstein's view on language where he clearly emphasizes the public instead of the private and the collective instead of the individual in dealing with such issues.

Ludwig Wittgenstein is one of the most influential philosophers who played a central role in 20<sup>th</sup> century analytic philosophy. He continues to influence current philosophical thought in topics as diverse as logic and language, perception and intention, ethics and religion, aesthetic and culture. According to him, all problems in our philosophy and also in our day to day life arise from misconception of language. So, proper understanding of language would dissolve such problems. Proper analysis and clarification of language, says Wittgenstein, helps us to show the fly the way out of the fly bottle.

We learn language from the society which Wittgenstein calls forms of life. From the society, a human being not only learns his/ her linguistic ability but also develops his/ herself as an ethical and moral being, i.e., acquires the capacity of judging him/ herself and know which action is right or wrong. According to Wittgenstein, language and life are internally related. Life is a public space in which all language users co-habit and communicate in an interrelated linguistic network. This space cannot be divided into individual (private) spaces. Wittgenstein uncovers this public space by rejecting the possibility of private language first and then by making language use a social phenomenon.

Wittgenstein's argument against the possibility of a private language is an endeavour to show that a certain conception of the mind, of self-consciousness or self-awareness, of knowledge of the other minds and of perceptual existence, is deeply incoherent. This incoherence of pervasive picture of the mind co-ordinates with fundamental misconceptions about language, meaning and understanding. These severally exemplify the distorting force of the pre-theoretical assumption that the essential function of words is to name and the essential function of sentences is to describe.

**0523329 PRABHAT, PRIYA (Jawaharlal Nehru University, New Delhi-110067). ECOLOGY AND ATHARVA VEDA**

The purpose of the paper is to study the sustainability and globality of consciousness approach which is there in Atharva Veda that shows a possible way to curb environmental crisis of today's time. The world in which we live stands at a precipice. Ecological disasters now threaten the very existence of human civilization. Anthropomorphism shows a way to overcome from this problem. No doubt, our Indian culture is full of this conception. Atharva Veda upholds the knowledge or storehouse of atharvanas, the procedures to conduct activities of everyday's life. It questions our way of living in terms of 'why' and 'how'. There is several anthropomorphism elements used in Atharva Veda. Earth is imagined as the mother and all of us her children. She never discriminates between us while giving her precious offerings. Therefore, we should not discriminate between all parts of environment as 'the other'. Here a universal bond is established between all parts of environment. And respect for all of them is invoked. Prithvisukta of Atharva Veda provides important insights in this respect. Earth is described as *Vasudha* for containing all wealth, *Hiranyavaksha* for having gold bosom and *Jagato Niveshani* for being abode of whole world. Earth is called *Visambhara* because she is representative of the universe. The mantras in the sukta narrate, explain, philosophize, personify and splendorize the earth as Mother personified and note reverence of the different species living on this planet.

Therefore, first we, humans, have to bring change in our thoughts in this respect which will automatically shape our actions towards a better, sustainable, peaceful and harmonious living. Prithvisukta does not belong to any particular country people or culture, it has a universal appeal. Earth belongs to everyone and everyone has the responsibility to protect it.

**Key words- Anthropomorphism, Ecology, Globality of Consciousness, Prithvisukta, Sustainability**

**0523330 ARUN, UDAI RATNA (Department of Philosophy, Jawaharlal Nehru University, New Delhi-110067). STRAWSON'S IDEA OF MORAL RESPONSIBILITY AND REACTIVE ATTITUDES - A CRITICAL LOOK**

Stance of philosophers on moral responsibility is related with how one conceives of free will. The idea of moral responsibility will always persist if we are living in a social system having moral obligations. P.F Strawson in his paper Freedom and Resentment (1963) tried to reconcile the differences between compatibilists and incompatibilists whom he referred as optimists and pessimists respectively. Compatibilists are those who believe that determinism cannot be denied and Incompatibilist are those who are opposed to idea of determinism. In this paper he has focused on moral responsibility and reactive attitudes instead of focusing on metaphysical problems of free will. Strawson throughout his paper has focussed on attribution of moral responsibility. And in doing so he has explained certain reactive attitudes with which we can hold people responsible. Those attitudes are generally dependent upon societal practices or, we can say, to hold somebody morally responsible we need to have social competence since the social practices are governing the deployment of reactive attitudes. Strawson argued that optimist and pessimists had over-intellectualized the issue of moral responsibility. By over-intellectualization he means that traditional tendency indicates that rationality of holding a person responsible should rely on some set of objective requirements and also, they themselves should be justifiable.

This paper is an attempt to understand Strawson's basic key points of moral responsibility and understanding of reactive attitudes or practices such as resentment, forgiveness, hurt, contempt or malevolence by applying it to different situations in plural societies and to see whether they really hold strong positions. To explain reactive attitudes, Strawson through various examples makes interesting points by saying that reactive attitudes are natural and reactive attitudes depend upon actions of other people. So, we will deal with these two problematic concepts of Strawson which holds central position in Strawson's paper. To understand practice of reactive attitudes and the attribution of moral responsibility as per reactive attitudes, its application to different contexts will be checked upon in India where Caste-based discrimination, various diversities in religious practices and eating habits which exposes the lacunae in the concept of reactive attitudes.

Through this paper our purpose is to critically look at the concept of reactive attitudes and how definition of moral responsibility is getting narrowed if we apply Strawson's idea of reactive attitudes in plural society like India. Further we will argue that such relation of reactive attitudes with moral responsibility is meant for homogenous society which has no diversity. And we will argue that reactive attitudes do not necessarily results in deploying feelings like hatred, love or malevolence. We would be trying to reach a broad understanding of Moral Responsibility too.

In this paper conceptual analysis method is used to check the deployment of reactive attitudes as propagated by P F Strawson, and comparing it with plural societies which are governed by different beliefs and traditions.

**0523331 ROUT, SUMIT (Annexe Hostel, University of Hyderabad, Hyderabad). SCIENTIFIC REALISM AND UNCONCIEVED ALTERNATIVES: A DISCUSSION**

Kyle Stanford, in his book Exceeding our Grasp: Science, History and the problem of Unconcieved alternatives, has suggested a third objection to scientific realism, which is essentially a combination of the two potent challenges faced by scientific realism, namely, Pessimistic induction and under-determination of theory. And he thinks this is a more serious problem than both of those problems and calls it problem of Unconcieved alternatives. Basically the challenge is when we look at over the history of science, we see the scientists failed to conceive of good alternatives to the theory they accepted. For instance- the evidence for Newtonian mechanics also serves as evidence for general relativity theory that would replace it. The problem of Unconcieved alternative is thus; the history of science suggests there have always been potentially good theories other than our accepted theories but we failed to conceive of. Here Stanford appears to claim that the Unconcieved alternatives are radically

distinct from our accepted scientific theories. A standard reply to this claim would be past failures do not imply present ones because present theories are more successful than past ones. Stanford's defence is surprisingly inadequate and he fails to show that past discontinuity imply present discontinuity.

**Keywords: Scientific realism, pessimistic induction, under determination of theory, Unconceived alternatives, methodology.**

**0523332 ROY, DEBIRUPA BASU (Department of Philosophy, Shri Shikshayatan College, Kolkata).  
ARGUMENTATIVE IMPERATIVE**

An imperative sentence is that which expresses commands or requests or instructions. Imperative inferences may be constructed with imperative sentences which may be of two kinds: pure or mixed. Imperative sentences cannot be accommodated within the scope of the classical logic. In our everyday life we are often met with imperative inferences so their necessity and usefulness cannot be denied. But in defense of imperative inferences philosophers and logicians do not take the same stand. Some of them deny the existence of imperative inference on the many grounds. One of them is that sometimes imperative inferences have permissive presuppositions, so issuing distinct imperatives amounts to change one's mind and thus cannot be construed as making an inference. This paper is an attempt to undertake the issue of the possibility of imperative inferences and defend that imperative inferences are possible, as some every-day inferences do have imperative sentence as premise and conclusion. They can also be considered as valid or invalid.

**0523333 SAMUEL, M. P. TERENCE (Department of Philosophy and Comparative Religion, Visva-Bharati, Santiniketan, West Bengal) UNDERSTANDING THE INTERPLAY AND CO-EVOLUTION OF NATURE, HUMAN AND SOCIETY**

In the oft-quoted fourth footnote to Chapter XV of *Capital*, Volume – I, Marx states, “Technology discloses man's mode of dealing with nature, the process of production by which he sustains his life, and thereby also lays bare the mode of formation of his social relations, and of the mental conceptions that flow from them.” (KM 2014 (Vol. I): 352), While discussing the critical history of technology in *Capital*, Marx identifies the dialectical linkages and inter-relations among various moments of a reality. The relationship among various aspects/moments of reality is at the same time both dialectical and inter-related. Marx was in full admiration of Darwin for relieving nature from the metaphysical and teleological explanations, as Vico did, and for positing nature's technology as rationally verifiable empirical reality. While understanding nature's technology as a product of empirical reality in the fashion of Darwin, Marx tries to comprehend the modern technology, along with its different moments, in the fashion of historical materialism. In this way, he predicts the identifiable linkages among at least six elements in a particular historical epoch, viz, nature, technology, process/mode of production, production/reproduction of daily life, social relations and mental conceptions/consciousness. These six elements are dialectically linked to one another as well as they are inter-related. Quite interestingly, Marx says that technology ‘discloses/reveals’, and not ‘determines/causes’, while identifying the linkage between technology and the other elements. Marx was not in favour of technological determinism or economical determinism, but he posits the way how one aspect helps in revealing or disclosing the possibility of the other aspect dialectically and historically. All these six identifiable elements constitute the totality; they internalise the aspect of the other element through mutual interactions among them. These six elements hang together with their internal dynamics, their intense inter-relations and contingencies limited by their interplay. Hence there is no mechanical relationship among them as they are socio-historically conditioned. There exists a kind of autonomous development for each element of reality, however, limited by the socio-economic-historical conditions of reality. All the elements of reality co-evolve with one another with a kind of dynamics of perpetual transformation, as each element affects the other element in a dialectical manner within the totality of relations. David Harvey identifies this totality not as a “Hegelian totality in which each moment tightly internalizes all the others”, but as “an ecological totality”, in the fashion of what Lefebvre refers as an “ensemble” or Deleuze as an “assemblage”; as the multiple elements of a particular totality of relations co-evolve in an open, dialectical manner. Marx did not posit the inter-relations among the elements of reality as a competition among them for their survival or existence, as in the case of Darwin who explained evolution using metaphors drawn from British capitalism, but as co-evolution. This understanding illumines further what Marx said about the materialist conception of history as the relation between the base and superstructure in his earlier work, i.e., in

his Preface to A Contribution to the Critique of Political Economy; that the relation between the base and superstructure is impregnated with the dialectics modelled on co-evolution and interplay of multiple moments of the totality of relations of production.

**Key Words:** Nature, Technology, Human, Social relations, Materialism

## 24. PHYSICS

**0524334 BANYAL, RAVINDER K (Indian Institute of Astrophysics, Koramangala 2<sup>nd</sup> Block, Bangalore).  
ADAPTIVE OPTICS: RESHAPING THE STELLAR LIGHT**

The invention of the telescope in the 17<sup>th</sup> century has revolutionized astronomy. A vast body of astronomical knowledge is built largely from the light emitted by celestial objects over a wide range of the electromagnetic spectrum. The light photons start their cosmic journey by escaping from the surface of stars and streaming through free-space for hundred, thousands and millions of years, practically unobstructed by the intervening medium. However, the last stretch of photons' journey through Earth's atmosphere becomes tremulous and chaotic. The random fluctuations of temperature, pressure and density of different layers of the atmosphere produce spatial and temporal variations in the refractive index of the air along the light path. The phase of a perfectly flat stellar wavefront propagating through the inhomogeneous medium is randomly scrambled when it finally arrives at the telescope aperture. Images of night sky objects thus formed by ground telescope lose their sharpness and become blurry. The image smearing and broadening leads to the information loss. The telescope performance is ultimately limited by the atmospheric conditions, characterize by a seeing parameter  $r_0$  at a particular site. In such a case, no matter how big the actual telescope is, the image resolution cannot be better than a typical 10-15 cm aperture. Astronomers were long aware of the loss of telescope resolution by the atmospheric seeing. Isaac Newton himself had identified and acknowledged this limitation but saw no way to defeat it. He, however, had suggested certain operative measures to mitigate, if not completely eliminate the seeing problem. In *Opticks* (1730), Newton wrote, "*For the Air through which we look upon the Stars, is in perpetual Tremor... But, these Stars do not twinkle when viewed through... large apertures. The only Remedy is a most serene and quiet Air, such as may, perhaps, be found on the tops of the highest Mountains above the Grosser Clouds.*"

Adaptive Optics (AO) is a technological solution to overcome the problem of atmospheric seeing. A huge improvement in sensitivity and resolution can be gained with sophisticated real-time wavefront sensing and correction techniques using the AO. The idea was first proposed by astronomer Horace Babcock in 1953, then at Mt. Wilson and Palomar Observatories [1]. In his original concept, the incoming light beam is reflected off an Eidophor -a mirror covered with an electrified thin film of oil. The wavefront distortion was to be measured by a schlieren image and relayed back to the Eidophor mirror. The electric voltage would control the surface tension of the oily mirror and reshape it to match and compensate the incoming distortions in a close-loop operation. In Babcock words, "If we had a means of continually measuring the deviation of rays from all parts of the mirror, and of amplifying and feeding back this information so as to correct locally the figure of the mirror in response to the schlieren pattern, we could expect to compensate both for seeing and for any inherent imperfections of optical figure." Though, there was no fundamental difficulty, the required technology to build such a device had to wait for another decade and half. The US military was quick to seize the idea and began a sustained effort to harness the power of AO for military and satellite tracking applications. However, the military lead efforts in mid 1960s and 70s were carried out under strict vigilance and most of the research findings remained classified. Within last two decades or so a significant advancement in AO system applications has been made because of much improved fabrication technology, control system algorithms and signal processing techniques. It is not surprising that the major observatories around the world already have telescopes equipped with AO system. Adaptive optics is also planned for next generation of extremely large telescopes. In this paper author gives a general overview of the AO system and also highlights its impact on astronomy and other areas of research. We recognize that AO is a complex, multi-facet and technology driven enterprise. Therefore, an attempt will also be made to critically review major initiatives, current status and challenges we face in adopting and implementing this state-of-the art AO technology for optical astronomy in India. This area calls for fundamental ideas. Practical innovations can come from India too if adequate support is provided by the government and interdisciplinary collaboration is permitted. For this, basic AO concepts should become a part of Optics course taught in our colleges and universities and some elementary experiments should be planned as a part of the coursework.

**0524335 BHATTACHARYA, SARBARI (Department of Physics, Bangalore University, Bangalore). HITCHES ON THE PATH TO A SOUND TRAINING IN PHYSICS: A TEACHER'S PERSPECTIVE**

In the sequence of courses a student needs to take to finally adopting Physics professionally, one invariably finds course instructors according blame for the poor quality of students on the earlier stage of education. Undergraduate level instructors blame poor schooling, Masters level instructors blame the undergraduate programme while elite research institutes invariably have a graduate school that mostly aims to cover up for the poor training their research student, intake has had at the Masters level. This leads invariably to a repetition of course material which squanders away important resources like effort and time, both on the part of the instructor and the instructed, making the learning process a lengthy and inefficient one.

To attempt a circumvention of this, two key aspects need to be examined. The first deals with the motivation students have for taking up an undergraduate programme in Physics, what they expect the course to do for them and whether these needs are being addressed in the right manner. The second is to understand whether the current policies in place with respect to hiring teachers, their routes for career advancement and incentives for teaching well are indeed conducive to good and effective training. Without a careful look at these aspects and an attempt to address the flaws there, the current scenario of the blame game for poor training is very unlikely to end. In this paper, author tries to highlight, from her own personal experience, what appears to be the gaping issues in the training process and suggest possible solutions to some of these problems.

**0524336 CHATTERJEE, S (All India People's Science Network). INNOVATION AND PHYSICAL SCIENCE IN THE REALM OF SHIFTING POLICIES**

The Scientific Policy Resolution 1958 was adopted by the Indian parliament by a consensus, showing a broad policy agreement to build a welfare state that could be accomplished “only through the scientific approach and method and the use of scientific knowledge that reasonable material and cultural amenities and services can be provided for every (emphasis added) member of the community.” The idea of self-reliance which was the cornerstone of the Nehru- Mahalanobis ( Mahalanobis was a physics professor) plan of development arose from the aspirations of the freedom movement, which also saw the emergence of a science-politics joint platform in 1938, after Subhas Bose's election as the Congress president. In this, Meghnad Saha, a renowned physicist was instrumental in linking the science community with the policy questions in the National Planning Committee, which was headed by Jawaharlal Nehru.

The Scientific Policy Resolution 1958, noted the ever widening gap between the scientific capabilities of “advanced and backward countries” and sought to adopt “the most vigorous measures” so that “by putting forward our utmost effort into the development of science that we can bridge the gap.” The resolution finally promised to offer, through government's measures, “good conditions of service to the scientists and according them an honoured position, by associating scientists with formulation of policies, and taking such measures, as may be necessary from time to time”. This, more or less echoed what Subhas Bose had said in 1938, as the Congress President, justifying J.D. Bernal's statement at that time, “ Probably the best workers for Indian science to-day are not the scientists but the political agitators who are struggling towards the end” “to release the enormous potentialities for scientific development in the Indian people” by transforming them “into self-reliant and free community.” For achieving this vision, Saha would analyse such diverse areas like integrated river valley schemes, oil and invisible imperialism, need for geophysics research, need to set up glass and ceramics industry in India, set up the first nuclear physics and biophysics groups in the country as also address the question of calendar reform; apart from nuclear issues, Bhabha studied electronics policy that led to the creation of the Electronic Corporation of India.

The above consensus appears to have been weakened in the 1980's and largely lost at present. Integrated approaches soon declined and the country saw stagnation in several areas. Due to the governments' disinterest and lack of concerted support, the country let go the initiatives that were taken in the fields of indigenous production of silicon or of liquid crystal displays, where an integrated innovation chain linking research labs to production units was envisaged but not executed.

The paper aims to study some of these cases and examine the policy shifts in 1983, 2003, 2013 and in “Make in India.”

**0524337 CHATTERJEE, S (All India People's Science Network). PHYSICS, HISTORY, DEVELOPMENT AND EDUCATION: EDUCATING ON GLOBAL WARMING**

Global warming is a phenomenon that was confirmed through several interdisciplinary scientific studies, of which physics forms a very important component. The unmistakable evidence that the earth is heating up at an unprecedented rate has given rise to a sense of urgency and resulted in global public awareness campaigns like “Climate Strike” and “Global Marches”. This issue needs to be taken up in the science syllabus in India. While these mass campaigns lead to public awareness, these are temporary actions: what is needed on the other hand, is continuous mass education that can take place in class rooms, in an intensive way, from college level onwards.

This subject is eminently suited in classes on thermal physics, atomic physics and spectroscopy where systematic development of the fundamentals of science, in any case take place. This educating process also has to look back in history and study the developmental processes world over, since the industrial revolution in Europe, where for mass production, animal power was replaced by the steam engine. Thermodynamics thus became a new branch of study. This phase also saw a surge in chemistry, laying finally the foundations of atomic and molecular science and establishing spectroscopy as an important branch of science.

This above knowledge base is sufficient to introduce the question of global warming and climate change to the physics students in B.Sc. and M.Sc. level. This also means that a student who continues up to masters level, would be in touch with this issue for full five years. There is an adequate number of text books on thermal physics, atomic and molecular physics and spectroscopy, and material from these books have to be properly adapted. In addition, a short introduction to radiative transfer and an accompanying exercises in computation would be sufficient upon which the student and teacher can build. For the student, global warming can be important project work and can also be taken as a Ph.D. level research subject for both.

This paper, while making a plea to the UGC to include the above topic in higher education, considers certain steps that are to be taken by the physics community, e.g. to bring in the chemist, botanist, zoologist, environmental scientist in supporting this demand. For the physics community, it would entail the task of supplementing the existing text books with chapters on global warming and developing the suitable pedagogy. This must include history of science and technology, more specifically the works by Fourier, Ahrennius, Tyndall and Callendar and the final confirmation on global warming in the 1990s that led to the signing of the Kyoto Protocol.

The paper urges the physics section to identify the process for a structured and systematic education on global warming, with a special demand to the academia to accept the need for such an education. In particular, inputs from teachers is specially sought.

**0524338 DUBEY, ANUJ KUMAR (Department of Physics, Sri Radhey Krishna M. D. College, Kanpur). METHOD OF EXTREME CASES**

The idea pointed out in this article is very useful, when one is interested in arriving at the answer to a question, rather than the steps involved in arriving there at. The class of question that can be handled in this fashion is very large. The only limitations are that the questions must be of multiple choice questions and should not involve the numerical values in the choices provided. It is very easy to see that the range of applicability is wide and that it covers a big percentage of the questions in any multiple choice type examinations. To demonstrate the idea best, it will be presented with help of various examples. The author giving very few examples here, but it will make the idea clear. The given examples are only the representative of the ideas employed in this approach, which is being phrased as the ‘Method of extreme cases’. It is recommended that this method is used in pedagogy and also used to explain the interplay of forces in the system.

**0524339 ELANKUMARAN, K (Department of Physics, RKM Vivekananda College, Chennai). NEED OF MODERNIZATION OF PHYSICS LABORATORIES IN UNDERGRADUATE PHYSICS EDUCATION**

Physics describes how the Universe works. Laboratory education is fundamental to a course in Physics as the student can get a glimpse of this in a laboratory under controlled conditions. This learning is not possible either on a black board or on a projector screen. This method of the education system could produce great experimentalists like K. S. Krishnan and Sir. C.V. Raman. However, in the present day physics laboratory, an experiment is understood by the students simply as a physical process that involves taking down readings from an equipment set up by the laboratory assistant and insert the thus obtained data in a formula to get a final number agreeable to the concerned teacher. Neither is there a discussion among students nor is there a deliberation with the teacher. Once the list of experiments is given by the teacher for that semester, the students copy even the tabular columns from some books on experimental physics that are available in the market.

The other problem plaguing the physics laboratory course is that only theory papers are revised whenever there is a syllabus revision. The same experiments are continued in PG classes for more than four decades with the outdated equipment.

In this 5G era, there is also a strong need to modernize the experiments. Whenever, there is a proposal on this matter, in every board of studies meeting in an institution, the immediate reaction is to blame the cost of the equipment for not updating them. Even after Indian Academy of Sciences and a few other institutions have come out with low cost equipment, the takers are few. There are other alternatives in the form of 'virtual labs' that have been suggested by a few institutions to cut down the cost. However, it should be noted that there is no replacement for real experiments to learn physics. One can keep 'virtual lab' as an additional tool along with real experiments.

The aim of the paper is to address this problem among members of the physics community and seek suggestions to improve the situation.

**0524340 GUPTA, RANJAN (IUCAA, Pune) INDIA'S INVOLVEMENT IN MEGA PROJECTS IN ASTRONOMY AND ITS SOCIO-ECONOMIC IMPACT**

India in recent years has entered into several mega projects (India's contribution will be approximately 300 Million US\$ in each of these projects) in the area of Physics and Astronomy where it has existing collaborations with various international communities in these areas.

The main eight of these are: ITER; LHC & FAIR; INO; SKA; TMT; LIGO; ASTROSAT and ADITYA-L1.

**0524341 HAQ, RUKHSAN UL (Skoruz Technologies and Johnson and Johnson, Bangalore). INTERFACE OF ARTI\_CIAL INTELLIGENCE AND THEORETICAL PHYSICS: SPECIAL FOCUS ON INDIAN CONTEXT**

It is an obvious fact that with the rise of computers, we have ushered into a digital era where computers and hence computation forms the integral part of our routine life. The new developments in computer technology gets imperceptibly updated in our lives. However, there are two main directions in the field of computation which are going to radically transform the socio-economic matrix of the human society. These two computational paradigms are: 1. Machine learning/Deep learning which is more popularly known as Artificial Intelligence. 2. Quantum Computation. Quantum computation will take more time until its full technological power gets unleashed. On the other hand, deep learning applications have already made their way into our lives. The automatic translation of one language to another one as done by natural language processing (NLP) algorithms is just one small example. The recent rise of artificial intelligence, artificial neural networks, and the associated fields and applications have made all of us spell-bound. In this paper, we are going to highlight some



aspects of the deep learning which are usually not discussed in the artificial intelligence literature. These aspects show the interface between theoretical physics and the deep learning algorithms. This will open up new directions for physics community to understand more on the side of deep learning. Using the examples of the natural language translation especially in the context of Indian languages, we will demonstrate the power of deep learning in making tremendous social impact. Lastly, we will also suggest some directions for physics students to make their way to deep learning fields.

**0524342 KAMALA, Y C (Physics Department, National College, Basavangudi, Bengaluru). A NOVEL WAY FOR TEACHING-LEARNING OF PHYSICS: LEARNING PHYSICS THROUGH VIDEO FILM MAKING**

Learning science is an innovative exercise. It has to be objective, quantitative and have a canvas of universality- the mental process of learning must accept the exercise of experimental verifiability, which is an inseparable part of this learning. In this process, not only would the student gain knowledge but would also acquire a positive mental framework. In this context of physics learning, making of video films of their own experiments and experiences would form an innovative exercise. This process involves video shooting, video script writing, sound recording, video editing all of which the physics student would learn through their experience and experimentation in the process of video-making. Altogether, the experience of learning and this new innovative experience may help to guide them to a new professional training. We had planned to introduce our B.Sc. students to this new hands-on training. In 2016-19 it was decided to introduce the B.Sc. students to video making and simultaneously to science learning. This new plan succeeded and the students not only learned a new technique but it also helped in their own attitude to the learning process in general. In this article, we discuss the plan, process, steps and experiences that were involved in this new learning process.

**0524343 MADAMPILLY, BINDU; RADHAKRISHNAN, RANJITH AND NENMELIL, SAJITH (.....). ROLE OF PHYSICS IN ENGINEERING AND TECHNOLOGY**

Physics has often been referred to as the mother of all modern science. However, does our education system tell us, why this has been so? In this paper, we further ask: what is the position of physics in modern day science, or in engineering or technology, particularly in the technical education system. In the modern day, as many branches of science evolve, the question arises, if we are undermining the basic science behind some of these while emphasizing on only their engineering and technology aspects of it?

The present paper will list out certain landmark developments in physics that have revolutionized our lives since the twentieth century, largely because of their impact on technology. The twentieth century revolution of physics led to the invention of the transistor, microchip, digital communication through satellites etc. As engineers, it is necessary for us to recall that there have been many Nobel laureates like Charles Kao from the field of physics, who have contributed to the field of computing. Kao pioneered the development and use of fiber optics in telecommunication. Fiber optics is the science of transmitting data, and voice by the passage of light through thin, transparent fibers. Similarly, we can see the application of physics in several aspects of information technology and in many other technologies prevalent today. An interplay between basic science and technology is missing in our pedagogy both in our engineering studies as also in science pedagogy. A plea will be made in this paper to introduce studies in history and interrelation of science and technology in our educational system from undergraduate level onward.

In many cases, the idea of development of engineering and technology is directly linked to the influence of physics to that particular stream. Today if we look at the production system and engineering related to this production system, we can see application of physics in each and every area. We always talk about inventions/innovations in the area of engineering. In reality we can see how effectively we are applying the knowledge of physics into engineering. An average student of both engineering and physics would generally be unaware of this inter-dependence.

For example, Information technology is a relatively new field in engineering and technology. In the current day we all can easily relate to computers and smart phones as we use them in almost every aspects of life. Lot of us may not realize that something as common as a smart phone uses both the extremes of physics, namely Quantum Physics and General Theory of Relativity. Quantum physics play a crucial role in today's computer chips which form the Central Processing Unit (CPU) which is considered the brain of the computers. We all are familiar with maps on our smartphones for navigating from one location to other. But we may not be really aware that General Theory of Relativity lies at the core of GPS enabled navigation systems. With this, make a demand for joint actions by professional bodies like the Indian Physics Association, IEEE and the Institution of Engineers. The Bangalore Science Collective would present its plans to play an active role in this process.

**0524344 MALLIK, PROTEEP (Azim Premji University, Bengaluru). A BROAD-BASED PHYSICS UNDERGRADUATE EDUCATION IN THE INDIAN CONTEXT**

The teaching of undergraduate physics is undergoing a crisis in India. Most of the science-stream students are not interested in studying physics after high school, many opting for professional and management courses instead. This has hampered fundamental research in physics, and has also created an innovation vacuum of sorts. Furthermore, this has also lead to a shortage of good science educators, policy makers and administrators. This paper will describe an effort by the School of Arts and Sciences (SAS) at the Azim Premji University (APU) to create a broad-based physics undergraduate programme in the Indian context. SAS has started addressing this crisis by implementing innovative pedagogies, creating diverse and inclusive classrooms, integrating laboratory and hands-on work into courses, and emphasising the interdisciplinary nature of physics and the interconnectedness of physics and society. Over the last 5 years SAS has developed a physics curriculum that aspires to train not only future physicists and physics educators, but also socially conscious citizens who will devote their lives to public service addressing important issues facing our society such as inequality, environmental degradation, and climate change among others. The author discusses what we hope to accomplish in the longer term and mention some of the early results from our experiments in physics education at the undergraduate level.

**0524345 SAHASRANAMAM, AJITH (Ongil Private Limited). A PHYSICS BASED APPROACH TO DATA SCIENCE: ADAPTING PHYSICS CURRICULUM FOR THE EMERGING PARADIGM**

Business enterprises generate an enormous amount of data from their operations. The generated data could come from different systems including accounting, logistics, inventory systems. While statistics has always been used to study and make the operations more efficient, the recent increase in the computational power, use of internet to easily collate data spread across different systems, have altered the data analysis paradigm for enterprises.

Leveraging data has become the key for the enterprises to grow, differentiate and even survive in recent times. This means that Data Science, the system of using data to derive business insights and make business operations more efficient, is central to enterprises' growth. Data Science employs a wide range of tools from different fields in the process of increasing business efficiency.

A physics-based approach to problem solving could prove particularly useful in tackling the business problems encountered by enterprises. This approach involves forming a mental image of the problem, abstracting the problem to retain the key factors that affect the outcome, converting the conceptual framework into a mathematical one, solving the mathematical equations and evaluating the answer to see if the outcome is reasonable.

However, for multiple reasons (which will be discussed in the paper), the physics-based approach has not been the centre of the data science emergence. Rather, an algorithm-first approach has been widely used in the field. An algorithm-first approach is one where a set of pre-defined algorithms are applied iteratively to solve the problem at hand. This approach has proved highly successful for certain automation tasks. However, various surveys have highlighted the limitations of the approach in solving key business challenges.

The paper will examine the differences between the two approaches with examples. It will then explore how in the near future a physics-based approach can become central to overcoming the current challenges in data science.

Further, even in fields of physics such as astrophysics and particle physics, data analysis plays an increasingly central role. Therefore, it is vital that the undergraduate and post-graduate physics education in India are suitably adapted to enable students to take advantage of the emerging trends to contribute significantly in the space.

The paper will include examples of data science techniques that could be introduced to students, how public datasets could be leveraged for the purpose and how experiments could be designed that could take advantage of the techniques.

**0524346 SHASTRI, PRAJVAL (International Centre for Theoretical Science, Bengaluru). BRIDGING THE INDIAN SCIENCE DEFICIT: THE ROLE OF THE PHYSICIST AND PHYSICS INSTITUTIONS**

Although Indian citizenry has embraced technology in daily living in an extensive scale, as epitomised by the deep penetration of cell-phones or foetal diagnosis equipment, there is a major lacuna as well as skepticism in that very same citizenry regarding the use of scientific thinking to understand even simple natural phenomena around us. So while science is for everyone and the scientific method of understanding the world is a way of life in modern society, there is a disconnect among Indian citizenry between perceptions about technology and perceptions about the scientific method. Do the root causes of this disconnect lie within our science education in general and physics education in particular? Or are they attributable to current physics practice? Or are they embedded in the social processes outside of the science realm? These questions and the role of physicists and physics institutions in the way forward will be discussed.

**0524347 SIVAKUMAR, A. AND DHAS, S.A.MARTIN BRITTO (Department of Physics, Abdul Kalam Research Center, Sacred Heart College, Tirupattur, Tamilnadu). SHOCK-WAVE-INDUCED CRYSTALLIZATION IN UNSATURATED WATER**

It is well known that super-cooled materials can be crystallized under the application of shock waves. This is the first report describing crystallization from unsaturated liquids. Shock-wave-induced crystallization of salts from environmental ground and sea water samples is explored. A table-top pressure-driven shock tube is utilized so as to produce the required shock waves of Mach numbers 1.1, 1.2, 1.4, 2.2 and 4.7. The demonstration comprises a train of acoustic shock pulses applied to the water samples. As a consequence of the impact of the shock waves, the colorless water becomes turbid, following which tiny crystallites are precipitated at the bottom of the vessel after a few minutes. The obtained precipitate is subjected to powder X-ray diffraction and energy dispersive X-ray spectroscopy analysis to confirm the nature of the settled particles and the elements present in them, respectively. From the observed results, it is concluded that shock-wave-induced crystallization in water provides an alternative method for removing dissolved salts from both ground and sea water samples. Fig.1 shows the photograph of ground water (top view) before and after shock wave application.

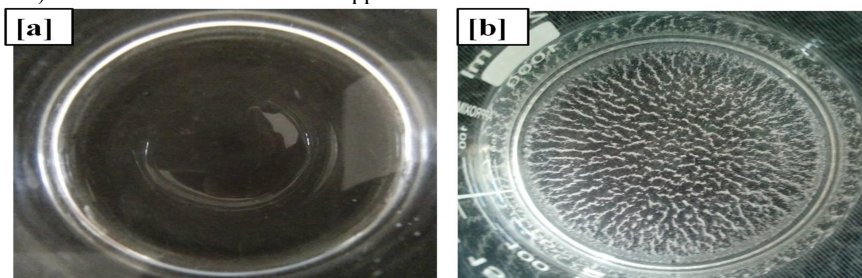


Fig.1 Shock wave treated ground water (a) before shock (b) After shock wave treatment

**0524348 THAMPAN, ARUN V (St. Joseph's College (Autonomous), Bengaluru). SOME OBSERVATIONS IN PHYSICS PEDAGOGY AT MASTERS LEVEL**

In this paper we present some observations in the line of duty of teaching physics to master of science students. The observations contrast the outcome of an MSc Physics course and the fidelity of the students to the prerequisites for such a course. The gap between the outcome and the prerequisites present a challenging situation for instructors at these levels. The control group (we won't present the data but discuss only the broad characteristics) are the students that come into the authors' courses. The choice of physics made by a minority but significant portion of the class appears to be a result of a cognitive bias. The fidelity to the prerequisites appear to be a result of a lack of reinforcement of knowledge through skills based pedagogy at the Bachelors level. As an example, the students who come to the author's class are students who have not cleared JAM (Joint Admission Test in MSc) or similar competitive exams after graduating from the Bachelors' course. The Government mandate requires the students who graduate from Masters to be able to qualify the National Eligibility Test (NTA NET) in order to be considered eligible for future employment. Bridging the gap between the Bachelors' level student to one able to qualify NET proves to be very challenging. These will be detailed with some examples from the experience of teaching about 8 groups of students.

**0524349 WADIA, LEENA CHANDRAN (Observer Research Foundation). COMMUNITY CONNECT: A NEW PARADIGM FOR MULTIDISCIPLINARY EDUCATION AND RESEARCH MADE POSSIBLE BY THE DRAFT NEP 2019**

A serious flaw in the Indian Education System, both at the school education level and the higher education level, is the inadequate opportunity for hands-on and experiential learning that students have. One key reason for this is the lack of adequate funding to educational institutions, given that India spends less than 3% of GDP on Education and only about 0.7% of GDP on Research. Another important reason is the lack of autonomy for faculty to design their own courses, select appropriate pedagogies and assess students on their own, in ways that promote self-learning and learning by doing. The draft National Education Policy (NEP) 2019 provides for genuine autonomy to be given to good educational institutions, as determined by accreditation outcomes, thus opening up new avenues for higher education institutions (HEIs) to innovate towards providing quality education.

The draft NEP also places considerable additional responsibilities on HEIs by requiring them, among other things, to have close connections with their communities. This has been done to benefit the local communities as well as to provide meaningful education to students that also helps sensitize them to societal needs. Another responsibility that has been placed on schools and HEIs is to integrate vocational education into mainstream higher education. This too requires considerable community connect since students will require hands-on training in the vocations of their choice, something that is best done at the premises of industry, businesses, NGO, farms, clinics and so on. Current norms for vocational education in schools and colleges require that approximately 60-70% of the course time is spent on practical training and only the balance for theory.

Both these challenges can be converted into opportunities for meaningful education and research provided HEIs are willing to think out-of-the-box and involve groups of students into looking for solutions for real life problems by working on them for a sustained period of time. Quite naturally, the solutions to many problems in health, livelihood, environment etc. will require an interdisciplinary and multidisciplinary approach in which expertise from multiple scientific and social science disciplines will have to be brought into play.

Some HEIs in the country have taken the lead in engaging with the community in innovative ways. This paper will highlight some of these efforts in the form of 'case studies' and seek additional inputs from the participants on the way forward.

## 25. POLITICAL SCIENCE

**0525350 BANSAL, MEENAKSHI (Department of Political Science, J.V.M.G.R.R. College, Charkhi Dadri, Haryana) EVALUATION OF ARTICLE 19 OF INDIAN CONSTITUTION IN REFERENCE TO INDIAN WOMEN : AN EMPIRICAL STUDY**

Indian Constitution begins with the preamble where it is mentioned that all citizens possess the rights to liberty of thought, expression, belief, faith and worship. As per the article 19, all citizens shall have the right (a) to freedom of speech and expression; (b) to assemble peaceably and without arms; (c) to form associations or unions; (d) to move freely throughout the territory of India; (e) to reside and settle in any part of the territory of India. However, there is a dark side to this freedom where the government and its policies are allowed to limit it. The scariest hindrance to this right is that the voices of women in our country are silenced both at home and in society also as seen in the outburst of the #MeToo movement. Here, the author has tried to evaluate the article 19 of Indian Constitution in special reference to Indian Women. The research methodology is empirical in nature and for data collection both primary and secondary sources have been taken. The primary data has been collected with the help of schedule (containing 10 questions) from 30 women respondents chosen by random sampling and secondary data has been collected from books, journals and different websites. The findings suggested mixed responses where some women respondents enjoyed the article 19 and others do not have access to the provisions of this article in their entire life. Citizens whether male or female have to be watchdogs to ensure that we get freedom, we deserve.

**0525351 BHAT, TAHIR RASHID (Department of Political Science, University of Kashmir). CHANGING DYNAMICS OF POWER: HOW “SOFT” POWER HAS BECOME A NEW CURRENCY IN INTERNATIONAL RELATIONS DISCOURSE**

Aside from the need for better understanding the processes of power in international relations for scholarly and intellectual reasons, the world we are living in, is in an especially tumultuous and sensitive period at present, and this situation promises to be with us in the future. Indeed, while the issue of power is at the very core of interactions among nations, the study of international power is still quite underdeveloped relative to its importance in international politics. The purpose of this study is neither to trump the popular definition nor to settle the age old debate, but instead to challenge the conventional wisdom by asking: Can the harder augmentation power be a bad thing for nations and hence a new version of soft power should be adopted? In the international environment, following the post-cold war era, military confrontation and the practice of hard power has become extremely precarious. With globalization leading to complex networks of interaction, and the rising presence of democratic regimes and the influential role of non-state actors, the practice of public diplomacy, as the most evident form of soft power, was and is rendered with great significance in the conduct of international relations. Since soft power has gained a whooping currency in contemporary international politics and has become an important component of foreign policy globally. According to Joseph Nye, soft power is the ability to influence others to get the results one wants through ‘attraction’ rather than ‘coercion’ or payment. If a country has substantial soft power, its actions will be seen as more legitimate and it will be likely to counter less resistance from others. This form of power is becoming increasingly important in the contemporary international scenario. It is different from the traditional (neorealist) understanding of power related to coercion, which focuses on a state’s military and economic strength, that is ‘hard power’. Soft power, he writes, “is the ability to attract, and attraction often leads to acquiescence.” Its resources are those that produce such attraction such as an attractive culture, ideology and institutions. In other words, a country with strong soft power will find other countries more willing to accept its leadership role regionally and globally, open up to cooperation and support its objectives in the international arena. There is no doubt that India has a huge repository of soft power assets which it can leverage in the pursuit of foreign policy interests. The Modi administration has not been shy of deploying the country’s soft power assets as it projects the idea of rising India. India’s soft power is talk of the town, the global presence and popularity of Indian cuisines and Bollywood cinema, the visibility of Indian art and literature as well as Indian spirituality—from yoga to alternative life styles makes global people highly receptive of our culture. In the contemporary globalized world, it is not the side with bigger army, but the side with a better story, that wins. India must remain the land of a better story. To be a source of attraction to others, it must preserve a democratic pluralism that is such a civilizational asset in our globalizing

world. India's soft power if effectively executed in its foreign policy goals would catapult India into a leading benign rising power not only in South Asia but all across globe with its unique blend of soft power assets.

**0525352 CHAKRAVARTY, PRASANTA (Department of English, University of Delhi, New Delhi-110007).  
THE INTERSTICES OF CIVIL WAR: THE SPACE THAT REMAINS**

Ordinary rules of conflict are, as we know, abandoned during civil wars. It becomes a space of high intensity domestic warfare among various sects and factions. Each faction creates its own space/silo/echo chamber through which the world is experienced, while it is seen through various mutually exclusive tunnel visions. Interestingly enough, ideological debates become less and less important. In such a transformed space, the very distinction between principle and personal are blurred so that a deliberate estrangement happens between the warring parties who often already know each other. Such a space of distrust creates a kind of patina over other forms of exchange that is kosher in more usual and ordinary forms of conflict, negotiation and diplomacy. Radical forms of disintegration of trust among factions voids reciprocity and stamp an impasse over all personal and public spaces in the polity. Consequently, civil wars often become prolonged battles of attrition that takes both an internal and external toll over individuals. But civil wars also give individuals great clarity and a sense of levelling about relational spaces. Wisdom comes with a price. The paper shall try to map this space of impasse, estrangement and clarity by engaging with certain literary and cultural tropes that illuminate the current juncture.

**0525353 DAS, ANITA (Department of Political Science, Kakojan College, Kakojan, Jorhat Assam). E-PANCHAYAT PLAN TOWARDS GOOD GOVERNANCE : A STUDY OF JORHAT DISTRICT OF ASSAM**

Good governance promotes participation, accountability, transparency, efficiency in all levels of government and institutions. It is a mechanism and process which enables a society to achieve sustainable human development. Good governance is crucially important in local self-government as people are affected more by local governments than by others layers of government. It is very much vital to study the system of PRIs and people's responses to the goal of good governance. Transparency is one of the constituents for good governance. It is related to notion of openness. Information Communication and Technology (ICT) is a vital tool to deal with the issues of transparency and efficient service delivery. In this connection, e-panchayat is a basic initiative taken by the Government of India through a comprehensive software solution and it attempts to digitalize panchayat functions. This project is a plan for achieving transparency in panchayat processes and activities. The Government of Assam has been adopting ICT for achieving transparency in governmental activities. e-Panchayat is one of the MMPs under 27 MMP of National e-Governance Plan formulated by Government of India. Through this paper attempt has been made to discuss the e-Panchayat initiatives taken by Government of Assam for bridging the connection between people and government. Jorhat District has been selected as the field area of the present research through the purposive sampling. The selection is done on the basis of criteria. Human Development Index of the district has been taken as the first criteria. Rate of literacy and rate of SC/ST population has been taken as other important criteria for the study. Jorhat district is one of the important educational and cultural centre of Assam. Jorhat district is located in the central region of the Brahmaputra valley. The district is surrounded by the river Brahmaputra on the north and Nagaland state on the south around the 26 degree 46 minutes north latitude and the 96 degree 16 minutes east longitude. Sibsagar District is in the east and Golaghat District is to its west. Jorhat was set up as a capital of the Ahom rulers in the closing years of the 18th century.

Awareness of e-panchayat initiatives does not exist among people. Interestingly, there is no demand or pressure from people for service delivery through use of ICT. Lack of awareness about benefits of using ICT tools is the major reason behind this indifference. Throughout the study, it has been found that the panchayat representatives still do not have much idea or awareness of the benefits of e-panchayat. Panchayat representatives are not interested in attending training programmes for enhancing skill or knowledge of e-panchayats. Inadequate infrastructure is one of the major problems in execution of e-panchayat projects. Jorhat Zila Parishad has been performing e-panchayat activities on behalf of most gram panchayats. For this purpose, persons recruited on daily wage basis are setting up a temporary office. In the sample gram panchayats computer equipments are being kept in custody of the panchayat secretary at his residence because existing panchayat offices were washed away by floods. Flood, erosion and post-

flood conditions often create serious obstacles in proper functioning of the panchayats in rural Assam. The panchayat under this study did not even have an office of its own. The officials mentioned that due to soil erosion they kept shifting their gram panchayat office. Due to lack of a permanent and secure office, official equipments are being kept in the panchayat president's house. The findings show that the government has been trying to give its best services to people but there are problems like of illiteracy, lack of awareness, insufficient infrastructure, poor network connectivity and execution of the e-panchayat projects.

**Key- Words – Transparency, e-Governance, Capacity Building, Good Governance**

**0525354 DAS, AYAN AND GOSWAMI, DEBAJIT (Department of Political Science, University of Gour Banga, West Bengal). POPULISM AND GOVERNANCE: A STUDY OF WEST BENGAL POLITICS FROM 1991 – 2016**

Ernesto Laclau's theoretical approach of populism has been applied to examine the state of West Bengal, India, which has witnessed instances of populist politics during both, its erstwhile Left Front government regime and the present TMC government. We have investigated the key factors that cause for the emergence and reproduction of populism in West Bengal.

Analysis has been done from the Post-Marxian lens, examining how the logic of Populism becomes a logic of Equivalence leads to creation of the underprivileged where popular demands meet challenges from antagonistic forces and hegemonic power blocs; and the logic of Governance becomes the logic of Difference, where the power bloc is able to accommodate particularistic democratic demands in differential manner, 'each in isolation from others'.

Our paper will address the questions as to what role is played by Populism as a mode of opposition and Populism (basically State Populism) as a mode of governance in West Bengal Politics from 1991 to 2016? What are similarities and differences between State populism of Left front regime from 1991 to 2011 and the TMC regime from 2011 to 2016? And finally, can Populism solve the problem of the crisis of representation of the underprivileged section of the people in West Bengal?

**Keywords- Populism, Governance, Left Front regime, TMC government, West Bengal**

**0525355 DASGUPTA, RAJARSHI (Centre for Political Studies, Jawaharlal Nehru University, New Delhi-110067). CITIES IN SOUTH ASIA: URBAN FLOWS INTO RURAL**

The paper looks at the changing peripheries of capital cities of South Asia in order to analyse the new geographies of capitalist accumulation. Particularly, it discusses at some length the latest wave of urbanisation in the western border of Dhaka. Not unlike other cases, this involves large-scale farmland acquisition, with rapidly changing landscape of property, assets and infrastructure, backed by real estate boom and state encouragement. Yet the process deliberately excludes a huge enclosure and people in the neighbourhood. Housing more than a million, this pocket is frozen in the 1970s when it was set up as a refugee camp, resembling the squatter settlement typical of metro cities in the subcontinent. The paper discusses how land speculation and infrastructure development, along with contestations, displacements, and dispossessions are thus intersecting to produce new urban subjects and social formations. Through a close reading of transformation in Dhaka, it makes a case that these forms and processes of urbanization are not only distinct from much of global north but the urban is actually sustained and coproduced by the agrarian in South Asia. The argument is buttressed with a brief comparative discussion of the urbanization process in other cities of South Asia, like New Delhi, Karachi, Kathmandu and Kolkata. Drawing upon some recent work by geographers, anthropologists and political scientists, we make a larger case for the relevance of a methodological dialogue with agrarian studies for understanding the specific nature of urbanization in South Asia. Such a conceptual reconfiguration of our urban spatial habitus, the paper contends, becomes urgent and necessary to understand the emerging patterns of democratic processes and especially electoral politics of late. Taken together, it is the central problematic addressed by the separate papers of this panel.

**0525356 DUTTA, RAJSHREE (Department of Political Science, P.G Department of Social Science, Fakir Mohan University, Balasore, Odisha). DEMOCRACY, CLOSENESS OF PARTY COMPETITION AND ELECTORAL VOLATILITY IN INDIA: AN ANALYSIS SINCE INDEPENDENCE**

Democracies in the modern times have evolved around party systems in which two or more than two political parties compete for political power. While we see stable party systems in the developed western democracies, we see considerable instability in the party systems of the developing countries. This is often characterized by extensive shifts in voter support to political parties, different degrees of ideological polarization or convergence. So the question of party system and stability of electoral support acquires greater importance in developing democracies than the developed ones.

In India, we find frequent party splits and mergers as well formation of new parties, leading to a significant increase in the number of parties at national and state levels. This phenomenon has been more noticeable in the last two decades and it has led to the proliferation of parties. An indirect fall out of the phenomenon of splits, mergers and re-splits has been the erosion of efforts towards the evolution of a two-party system in India or consolidation of a moderately plural party system. Political competition in India has grown rapidly in the last three decades. We see the emergence of a complex, fragmented party system, particularly in the post-1989 period. This increase in the number of parties should not be always looked upon with alarm or as a threat to the stability of democracy. Viewed positively, the entry of more parties introduces vibrancy as well as fluidity in the party system.

As elections have become more competitive due to increase in the number of parties, the vote margin of victory has dropped. The more the closeness between the leading and the runner-up party, it is assumed that the competition is more competitive between the top two parties. When there is more closeness in party competition, it is expected that there is greater amount of fluctuations in the electoral support for the parties, thereby resulting in increase in the electoral volatility. The present study is based on aggregate data analysis relating to general elections in India between 1952-2019. Using the Volatility and Closeness of party competition indices, this paper attempts to find out the trends and relationship between closeness of party competition and stability of party support at the national level since 1952 General Elections.

**Keywords: Democracy, Political parties, Party System, Closeness, Stability, Volatility**

**0525357 FATHIMA, HAFSA (Department of Political Science, St. Joseph's College, Bangalore). POLITICS OF MIGRANTS IN INDIA: ANALYSING THE ALIENATION OF MUSLIM MINORITY (2014-2019)**

Migration is one of the major security concern for India since liberation of Bangladesh in 1971. As India does not have a system of permanent residence and the entry, stay and exit of foreigners has been regulated through the Passport Act 1920, the Foreigners Act 1946, and the Registration of Foreigners Act 1939. Citizenship requirements and pathways are predominantly regulated by the Indian Constitution and the Citizenship Act, 1955. The Foreigners Division of the Ministry of Home Affairs (MHA) administers all matters, including policies, statutes, and rules, related to visas, immigration, citizenship, and overseas citizenship. But in September 2015 and July 2016, the central government exempted non-Muslim groups of illegal migrants from being imprisoned or deported. These are illegal migrants who came to India from Afghanistan, Bangladesh or Pakistan on or before December 31, 2014. The majority of illegal migrants are Muslims. This act of BJP government have alienated Muslim community. Party has been successful in diverting opposition attention towards increasing population of Muslim, issue of protection of land and identity from illegal Bangladeshi migrants. The major mechanism along with national recognition of citizenship is the doubtful voters or D-voters. D- voter is the baseless doubt which have deprive the fundamental rights, particularly the right to vote used as tool by government against minorities. The main objective of this paper is to analyze the BJP policy towards minorities and national recognition of citizenship on Muslim community.

**Keywords: Migration, Citizenship, Muslim Community, and Bangladesh**



**0525358 JAMSHED, QAZI MOHD. ( Aligarh Muslim University, Aligarh). ARTICULATING COMMUNITY RIGHTS: ALL INDIA MUSLIM LEAGUE - 1906-1929**

This paper makes an attempt to study the endeavour of Muslim League to protect the rights of Indian Muslims by way of finding out a solution to Muslim representation in the Legislatures and protecting their political interests during the period 1906-1929. The Simla Deputation was the result of the growth of Muslim political consciousness which reinforced the Muslim conviction that only an organised endeavour could succeed in safeguarding their interest and ensuring their independent political recognition as a Nation within a Nation. The Simla Deputation contrary to the popular perception was neither the outcome of British statesmanship nor a 'command performance'. The inspiration came from 'within and not from without'. The annulment of Partition of Bengal was an act of British betrayal which served indirectly to quicken the growth and development of Muslim political consciousness and underlined the need of self reliance and attaining in cooperation with the Congress a system of self-government. The Congress seized the opportunity and entered into an understanding with the League on constitutional reforms to be demanded with the government as a consensus national demands. However, the issue of Muslim representation in the Legislatures was considered the bone of contention between Congress and Muslim League in particular and the Hindus and Muslims in general since the conclusion of this Lucknow pact in 1916. They raised their voices against the separate electorate and blamed the All India Muslim League for the prevailing communal tension. The Muslim League and its leader Jinnah in order to find out a consensus formula for the amicable solution of the communal problems, represented by Hindu Mahasabha and the communal fringe of the Congress, succeeded in convincing the Community to sacrifice separate electorate and settle for a compromise formula popularly known as the Delhi proposals but failed to win the hearts of the majority community. An agitation was launched against the Delhi Proposals and Congress was strongly criticized for the acceptance of Delhi proposals and even Motilal Nehru, Jawaharlal Nehru and other Congressmen came under the pressure of the Mahasabha on the reservation of seats for the Muslims in Bengal and Punjab. The Muslim delegates, surprised by such volte-face of Congress leaders emphatically stated that they would not accept any deviation from Congress resolution of Madras session. Wounded and shattered by the treatment meted out himself and to the genuine amendments, he left the convention and called it " parting of the ways". And outcome was the counter proposals to the Nehru report which came to be known as Jinnah's fourteen points which since then became the basis of any discussion on future constitutional system.

*Methodology* adopted is descriptive as well as analytical and the conclusions drawn are based on sustained analysis and critical research of the available sources and scholarship on the topic.

**Key words: Muslim League, Congress, Simla Deputation, community rights, Lucknow pact, Delhi proposals, Nehru Report, Fourteen points.**

**0525359 KUMAR, KARAMALA AREESH AND JOHNSON, JUSTIN (Department of Political Science, St. Joseph's College (Autonomous), Bangalore, Karnataka). THE POLITICIZATION OF CRIMINALS TO CRIMINALIZATION OF POLITICS: A SERIOUS CHALLENGE TO INDIAN DEMOCRACY**

India established democratic institutions and the parliamentary system immediately after the independence and emerged as one of the largest democracy in the world. India is a country with diverse religion, culture, caste and languages. The role of caste and religion in Indian politics has emerged as one of the major threat to Indian democracy and resulted in the criminalization of politics. In the initial phase of independence politicization of criminals was a major concern, but in the present environment criminalization of politics is a major apprehension for the election commission. The vote bank politics based on caste-religion-region, corruption, money and muscle power, political defections, communal politics, lack of strong legislation, and loop-holes in election procedure are the main reasons for the criminalization of Indian politics. All these factors are significant in changing the political behaviour of the people and democratic institutions. Even political parties also selecting representatives on caste and religious-based lines to mobilize and polarize the voters of a particular community. The entry of criminals into politics is recorded very high in some states like Goa, Bihar, U.P, Kerala, Andhra Pradesh, Tamil Nadu, and Jharkhand. The criminalization of politics leads to the criminalization of administration by forming nexus between

police, bureaucracy, politicians, and criminals. Several measures were taken by the Election Commission, and Supreme Court of India to diminish the participation of criminals in politics, but all the attempts remained unsuccessful. If the criminalization of politics remains unaddressed, it can emerge as a major challenge to the secular society and it could create political instability in India. The main objective of this paper is to analyze the criminalization of Indian politics and its impact on democratic institutions. It will also try to explore criminalization of administration in contemporary India.

**Keywords: Criminalization of Politics, Elections, Corruption, Bureaucracy, Caste, Religion and Democracy.**

**0525360 KHATOON, NAFISA AND BISHEN, ANUBHAV (Public Policy And Governance Institution – Tata Institute of Social Science, Hyderabad). DISCOURSE SHAPING INDIA’S ECONOMY PATHWAYS IN CURRENT MILIEU**

This paper explores the current situation of political discourse which shapes the economic progress of India. In India, where the vast masses of the populace are poor and often socially disadvantaged, a relatively small group (elite) holds much of the power. The paper will discuss how Marxist scholars’ debate and discuss on the nature of class formation and mode of production in India currently.

Political decisions and discourse always affect the economic progress of the country. The in-egalitarian and exploitative political decision lead to distributive outcome of economic progress in which rich become richer and poor become poorer. The pro-market (or neo-liberal) reforms in the Indian economy in 1991 had connected Indian market with global capitalism, due to this economy’s import have improved but the debt situation have worsened. Neoliberalism has impacted the poor and there has been a significant rise in absolute poverty. The paper aims to find if the Constitutional goals of socialism, social and economic equality still hold significance or not. Has India left the path of a “welfare state” or it is currently manifesting itself in a more complex form?

To answer these questions, the paper goes into analyzing several policy of state intervention to enhance the socioeconomic change such as demonetization, GST, land acquisition bill, Stand-Up India and other economic liberalism policy that have aimed to curb black money, eradicate poverty etc. Also, emphasis would be around current economic growth statistics like Gross Domestic Product of current fiscal year, inflation, Index of Industrial Production and rural wage data of current year, etc. It would help in focusing on how political decision have shaped these statistics and guided the overall discourse.

**Keywords- political discourse, Marxist scholar, neo-liberal**

**0525361 KUMAR, DHARMENDRA (Centre for Political Studies, Jawaharlal Nehru University, New Delhi-110067). ANALYSING MARGINALIZATION OF CASTE AS SOCIAL PROCESS IN BIHAR**

The present article explores the tradition of the socio-economic oppression of the Dalits. Therefore, the present study attempts to understand the socio-political status of Musahar and Pan caste with special reference to Bihar. Caste is atypical institution and with peculiar magnitudes. In order to examine its implications for a broader understanding of social marginalization of castes. This study assumed that scientific endeavour requires comparison and that comparison requires careful definition of the phenomena to be studied. According to Roland ‘caste as a concept of strange spirit that extricates the country from every other and predominantly the western, and against ‘caste has become essentialized and turned into a substantialized history of India (Imagining India, 1990).

Social process of caste forces mahadalit to perform services essential to the maintenance of society as well as produce consumption material but are ranked lowest in the social hierarchy and also treated as untouchables. Many studies, on Dalit, remarks discrimination and exploitation as part of their life-world. They have been denied elementary facilities which available to privileged clean castes. They are born in servitude and die in poverty. They continue to be peripheral and marginal incapable of claiming equality with the privileged’. Society remains exploitative, unfair, and criminally unjust to them. However, the most deprived and down-trodden among SCs of Bihar are the Maha-Dalits who have placed at the margin of subsistence, etc. They live in a kind of social thralldom.

Sometimes they had to do bonded labour in which their wives and children were working lifelong servitude. Mahadalit were placed unfavorably in the ownership of productive assets as well as the distribution of income. Inequalities and social-injustice became inevitable parts of their life.

Maha-Dalits are still deprived and compelled to do traditional works. Inequalities tend to be cumulative in their case. Caste as a system of hierarchical, submission operates as a mechanism of extra-economic coercion of Dalit. It contains prescriptions to ensure unrestrained acquiescence of Dalit to caste Hindus by inculcating in them the dominant traits of humbleness. The traditional custom has definite political consciousness as it helps in nurturing instincts of submission among the exploited. In the prevalent social arrangement, Dalits have subjected to venous kinds of status disabilities. The values internalized entailed upon Dalits the solemn duty to serve the superior in the caste hierarchy. Such prescription could not challenge.

Dalits constitute nearly 15 percent of Bihar's population of 83 million (Dalits watch). The most impoverished Dalits divided into Maha-Dalits in Bihar. A government commission has identified 18 of the 22 Dalit sub-castes including Musher, Bhuiyan, Dom, and Nat, as Maha-Dalits. They constitute 31 percent of the Dalit population in the state. Although the commission has not included four Dalit castes in the Maha-Dalit category: Paswan, Pasi, Dhobi, and Chamar. These four constitute 69 percent of the Dalit population in the state. In 2009, Chief Minister Nitish Kumar announced a unique package of Rs.3 billion (\$76 million) for the socioeconomic development of the poorest among Dalits. He set up a commission in August (2009) for the welfare of certain Dalit castes that are socially and educationally more backward than others. Bihar is the first state to constitute a commission to study the status of the neglected sub-castes among Dalits and suggest ways to uplift them. The commission, in its first interim report to the government a few months ago, painted a bleak picture of the Dalit sub-castes. The report said there were no high school teachers or senior officials from these castes in the state despite reservations in government jobs for them.

**Keywords: genesis of castes, marginalization, marginalizality factors and process of castepolitics**

**0525362 KUMAR, RANJIT (Sutlej Hostel, Jawaharlal Nehru University, New Delhi-110067).  
EVOLUTION OF JUDICIAL REVIEW AND JUDICIAL ACTIVISM IN STRENGTHENING  
ENVIRONMENTAL GOVERNANCE IN INDIA: A CRITICAL ANALYSIS**

This paper will deal about the perspective of Judiciary on environmental issues through the lens of judicial review. There are several National and Global Laws for the Protection of Environment and Ecological Development. But, there is a problem in implementation of Laws for the Protection of Environment. Therefore, this paper would also attempt to analyse the conception of 'environmental justice' from institutional perspective, particularly from judicial approaches (Pro-environment, pro-development and integrated) and initiatives like Public interest litigation (PIL). PIL brings behavioural changes in Judiciary. It means it transforms the judicial functional attitude as 'politicisation of Judiciary' to 'Judicialisation of politics' in judicial cases in general and in Environment related cases in particular. The Indian Judiciary has tried to maintain the pace and balance between the protection of environment, economic development and ecological development, by dealing with various environmental cases. Therefore, this paper will also try to explain certain questions such as: how green is the Indian Judiciary? How the Indian judiciary, Supreme Court of India has dealt with the case of environmental issues? What are the legal, normative and policy approaches followed by the Supreme Court of India in environmental cases? How environmental adjudication become a significant part of judicial review and judicial review and judicial activism in India? How has the introduction of Public interest litigation (PIL) assisted in establishment of 'Environmental justice'? At what extent it radicalised the Indian Judiciary in Environmental issues? What factors determine the greenness of the Supreme Court?

Since, the court has started intervening in the affairs of executive in the post-emergency period; it was termed as a new judicial innovation in the history of the Indian jurisprudence. Nevertheless, the environmental jurisprudence has initiated some innovate process for resolving conflict related to environmental issues and further continue to dominating for more than the last 20 years. These innovative methods deal about both procedural and substantive characteristics of environmental Jurisprudence. Procedural innovative are such initiatives adopted by

judiciary that enlarge the environmental jurisprudence's existing procedure for protection and improvement of environment. These innovative methods had broadened the range for environmental justice by recognition of individual's right to have healthy environment, allowing applications on behalf of affected people. For example, easing the norms of application and expanding the sphere of PIL, evolving and incorporation of some environmental principle such as precautionary principle, polluter pay principle, public trust doctrine, absolute liability and sustainable development principle), recommendation about the establishment of green benches at the high court level, inclusion of environmental right as fundamental right, all these comes under procedural aspect of environment cases.

Substantive innovations aspect are those phenomenon, which stated about extra-legal methods of judiciary, where Court deals from government policy and governance structure of government for protection of environment and regulates how its orders would be applied. This innovations method has redefined the character of Court in the decision making process through incorporating of ecological principles and growing the range of environmental jurisprudence. Observation of Ground level reality, set up an expert committee, ideological influence and Individual stand of Judges, and prevailing socio-economic and political factor, appointing lawyer as an amicus curiae to speak on behalf of the environment, and all these comes under substantive aspect of judiciary, while dealing the with environmental case in the court.

**0525363 KUMAR, VIKASH (Department of Political Science, Jai Prakash University, Chapra Bihar). A STUDY OF THE INFLUENCE OF PAKISTAN ON INDIA-RUSSIA RELATIONS**

The History of India-Russia relations has been friendly. Since the end of the Cold War, India has been trying to further strengthen cooperation with Russia in the field of energy and defense. India has benefited from a strategic Perspective at the international level due to good relations with Russia. For Example, be it the India China War of 1962 or the Indo-Pakistan War of 1965-1971, Russia has supported India in all these Wars. In the United Nations General Assembly in 1991, Pakistan Proposed a "South Asia Nuclear Free Zone" Which was opposed by India. India was clearly saying that until China does not join it, this proposal has no meaning. Despite this, Russia agreed to that proposal brought by Pakistan. This was the effect of Pakistan on India-Russia Relations. The Purpose of this Research is to find out the reasons for the impact of Pakistan on Indo Russian Defense Relations. Our Hypothesis is that Russia-Pakistan relations can have a serious impact on India from a Strategic Perspective. Using historical and comparative methods in this research. It has been found that located in south Asia has become quite complex. Russia wants the US influence in South Asia to decrease and increase its influence, he can persuade Pakistan not to take action against India and play a constructive role in Afghanistan. Which will be in India's interest, however, if Russia deepens its relations with Pakistan and plays an active role in selling defense equipment to Pakistan. It will Prove detrimental to India-Russia relations.

**0525364 MAJUMDAR, MUNMUN AND SHIMRAY, RINREICHON H. (Department of Political Science, North-Eastern Hill University, Shillong). SIGNIFICANCE OF INDIA'S ANDAMAN AND NICOBAR ISLANDS IN INDIA'S ACT EAST POLICY**

Located at the juncture of the Bay of Bengal and the Andaman Sea, a group of 572 islands (of which only 37 are inhabited)—the Andaman and Nicobar Island chain—straddles the busiest trade routes in the world, spanning 450 nautical miles and sits strategically at the entrance of the Malacca Straits. Although administered by India, these islands have greater proximity to Southeast Asia—Myanmar, Indonesia and Thailand—than to the Indian mainland. About a third of India's Exclusive Economic Zone lies around the Andaman and Nicobar Islands, providing tremendous economic potential for tourism, fisheries, forests and hydrocarbon. The Modi government has drawn up an ambitious plan to transform the archipelago into the country's first maritime hub, pushing for infrastructure needed to boost the tourism potential of the islands' limestone caves and mud volcanoes. With increasing Chinese naval presence in the Indian Ocean Region (IOR), New Delhi has begun to acknowledge the strategic geopolitical significance of the islands with regard to surveillance of crucial Sea Lines of Communication. This paper will therefore examine how the ANI could also form the cornerstone for India's Act East policy and its maritime security strategy.

**0525365 PANDEY, RAJU KUMAR (Department of Political Science, Jay Prakash University, Chapra-841301). भारत में जिला सरकार की संकल्पना और संभावनाएँ : एक राजनीतिक विश्लेषणात्मक अध्ययन**

भारतीय राजनीति में 73वें और 74वें संवैधानिक संशोधन (1992) एक नवीन क्रांति के द्योतक हैं। इन संशोधनों ने भारतीय राजनीति, शासन एवं प्रशासन में एक नए अध्याय की शुरुआत कर एक नए युग का सुत्रपात किया है। राजनीति विज्ञान और लोक प्रशासन का विद्यार्थी परम्परागत संघ शासन में दो शासनों—संघ शासन (केन्द्रीय सरकार) तथा इकाई सरकारों का अध्ययन करता रहा है। भारत में भी अन्य परंपरागत संघ शासनों की व्यवस्था के अनुरूप शासन के दो स्तर—संघ शासन (केन्द्रीय शासन) और इकाईयों (राज्यों) के शासन का प्रावधान किया गया है। लेकिन जबसे 73वें और 74वें संवैधानिक संशोधन पारित हुए हैं और इदन के माध्यम से संविधान में जो प्रावधान किए गए हैं तथा स्थानीय निकायों को संविधान के अनुच्छेद 243 के विभिन्न उपबंधों तथा संविधान की 11वीं तथा 12वीं अनुसूचियों में जो अधिकार एवं शक्तियाँ दी गयी हैं, उनसे परिलक्षित होता है कि तत्कालीन केन्द्र सरकार स्थानीय स्तर पर जिला प्रशासन के स्थान पर स्थानीय सरकार की स्थापना की पक्षधर दिखई देती है।

उपरोक्त संशोधनों के माध्यम से जो नए प्रावधान संविधान में जोड़े गए हैं उनसे ऐसा लगता है कि स्थानीय स्तर पर भी एक सरकार का गठन किया जाय और स्थानीय महत्व तथा विकास एवं जनकल्याण से संबंधित अधिकार नव सृजित स्थानीय सरकार को हस्तांतरित कर दिया जाए। राज्य सरकारों को चाहिए कि वे स्थानीय विकास एवं जन-कल्याण से संबंधित विषयों के बारे में नीति-निर्माण एवं क्रियान्वयन का दायित्व स्थानीय निकायों को हस्तांतरित कर दें।

संविधान की 11वीं तथा 12वीं अनुसूचियों में पंचायती राज तथा नगरीय निकायों को स्थानीय महत्व के विषय प्रदान कर एक स्वतंत्र सरकार का दर्जा देने का प्रयास किया गया है।

**0525366 PANI, BISWACHINTAMANI AMBIKA PRASAD (Nalanda University, Rajgir, Nalanda, Bihar). MARKETING THE STATE: ENDURING ISSUES OF GOVERNANCE REFORM IN INDIA**

This is under pronounced disagreement as to whether the dynamics, nature and implications of governance set up based on the premises and promises of economic reforms of early 90s have been a boon or a bane for Indian State. Some political scientists argue that the neo-liberal reform has disrupted the traditional analytical and conceptual framework of political thinking, policy making and implementation. When it comes to neo-liberal governmentality and governance, the analysis of neo-liberal governmentality must form a basis to the deeper understanding of the process of governance as well as its historical constraints and compulsions. It is important to mention here that without a proper understanding of State, the dichotomy of governance be adequately irrelevant being an important concept of analysis. The various institutional forms or different trajectories of neo-liberal governmentality and governance vary not only from state to state but also within a state itself. A State possesses a definite and different set of institutionalized channels where the State apparatus and the public/stakeholders interact in a constructive manner on policy making and implementation. In case of State failure, when the market extends the services and remedy the States' flaws by enlarging its scope and reach, the market occupies the public ground and treated as market as possibility. It is to understand that the unremarkable and unusual functions of the State is what makes markets possible. But it is not to be ignored that the State directly or indirectly provides a conducive atmosphere for market to function and to become socially responsive and accountable.

In this context the role of the State calls for a rigorous analysis of the governance framework in a state. This paper is an endeavour to analyse the restructuring of State basically after the process of neo-liberal reforms in early 1990s. This paper attempts to look at the changing nature of public policy on governance related issues in globalized era. The major objective of the paper is to analyse governance reform which is the cause behind the changes occurred in the role of the State as well as the constant effort to market the State by focussing on the debate of State vs Market in India.

**Key Words: Governance, Reform, Market, State, Public Sector**

**0525367 PARIDA, SANGHAMITRA (Department of Political Science, SBR Govt (Auto) College, Berhampur, Odisha). FROM A WRETCHED PAST TO AN UNCERTAIN AND UNDIGNIFIED FUTURE: THE STORY OF MANUAL SCAVENGING IN INDIA**

Incredible India, Shining India, New India, Largest Democracy with the longest written constitution, are the some of the epithets by which India is known to the world. It also claims to espouse the philosophy of Vasudhaiva Kutumbakam. Needless to say, India acquired its identity through the modernist document called The

Constitution of India which promised a future based on the values of liberty, equality, justice and above all fraternity, to all the citizens. However, the claim of this paper is that this promise has not really been materialized in the last seventy years of India's independence as a historically marginalized section of the society is being deprived of this constitutional promise because of their birth, occupation, and gender. This particular section is known by the rubric 'Manual Scavengers'. This group of people comes from the category of people called as Dalits, who were/are considered as the lowest of the low castes within the Caste system in India. Thus, manual scavenging- where the Dalits and, particularly, the women among Dalits are forced to carry human excreta and clean dry latrines, sewers, septic tanks more often with bare hands, is an occupation which has its origin/root from the caste system in India. What is unfortunate is the fact of a 'politics of denial' by the Indian State as it as well as the states within India claims the non-existence of manual scavenging. Therefore, this paper challenges this politics of denial and argues that there is the persistence of the link between caste and the traditional occupation of manual scavenging. In fact, this persistence of the occupation violates the basic sense of dignity promised by the Constitution which is premised upon, to use a Rawlsian language, the primary good of 'free choice of occupation against a background of diverse opportunities'. Further, the claim of this paper is that the practice of manual scavenging as it exists today both in public and private sphere provides a new, subtle form of untouchability which is an anathema to the constitutional promise. This is nothing but a fraud on the constitutional promise. Hence, this paper attempts to interrogate this politics of denial and thereby the blatant violation of the constitutional promise with regard to one of the most disadvantaged section of Indian society whose past and future happens to be a story of wretchedness, uncertainty and indignity.

**Keywords: Caste, Untouchability, Dalit, Manual Scavenging, Dignity, Discrimination & Exploitation**

**0525368 PASWAL, NAZIR HUSSAIN (Department of Political science, Babasaheb Bhimrao Ambedkar University, Lucknow). CRISIS OF SECULARISM IN INDIA**

The present paper aim is to analyze the concept of Secularism in general term and India in particular from its origin. India being a secular state in the same way as it is the largest democratic state in the world with rigid and flexible Constitution. Secularism is the only way of development in a plural society like ours. But the occurrence of communal riots in the recent years indicates that the Indian Government has failed to establish a secular society. But after BJP came into power religion is being used as an instrument to get political mileage that paved the way to Communal politics, religious militancy, Mob lynching, poverty, illiteracy and political corruption and threat to secularism. But the present chaos will certainly be dangerous if sincere efforts with more stable secular policy are not made. Mostly problems will automatically be resolved if ruling Political party will act on the basis of the constitution and the country will tend toward peace, prosperity and development. This study addresses to the quickly as to how India opened the door to reform and rationalize majority religion. It also will attempt to trace the emergence of this variant of secularism, and discuss contemporary debates about its relevance and the Majoritarian idiom of Indian politics. This also paper is an attempt to study the challenges to secularism in India and its future. But it is fact that secularism is a principle of reality, not the myth of the minds of the academicians and thinkers. This study endeavours to observe whether secularism is the only way of development in the plural society like India.

**Keywords: Origin of secularism, Indian secular system, Challenges to secularism in India and remedies to curb secular crises.**

**0525369 ROYCHOWDHURY, SAHELI (Department of Political Science, Ramakrishna Sarada Mission Vivekananda Vidyabhavan). NO SPACE FOR CIVILITY: THE CHANGING LANGUAGE OF POLITICS IN KOLKATA**

Our point of departure is a recent public debate about a discernible increase in the use of uncivil language and gestures in electoral politics in India, and more specifically, in West Bengal. The more active participants in these debates are educated middle class individuals with known partisan identity, and a few – usually public intellectuals – who belong to civil society. While there is ambiguity about the notion of incivility, there is consensus – although not entirely codified – about the meaning of *bhadra* (civil) language among the (*bhadralok*) middle class. This is the basis of a moral panic about the rise of uncivil language and a putative moral decay it has come to

signify. Although the site of such debates is the city, it is reasonable to assume that the debate circulates in the larger society and implicates wider democratic politics. The paper explores how the idiom of uncivility is opposed to several elements at once: [i] the notion of urbane (as opposed to rustic); [ii] the preponderance of *bhadralok* in city politics since nineteenth century, which is highly critical of *chhotolok* manners; [iii] a significant range of cultural institutions in the city since the late colonial times; [iv] the reasonably institutionalized practice of political engagements in the language of liberal, democratic and Marxist political discourses; and [v] the constitutional prohibition on ‘unparliamentary’ words and expressions. The increasing use of uncivil language, including bodily gestures, must be understood in a larger setting comprising use of physical violence, bending laws and use of big money – all in the struggle over state power. What is interesting is the fact that many of those who indulge in uncivil expressions are very much part of the parliamentary process. Does it point to a habitus change, a change in structured propensities to think, feel and act in determinant ways? How does one explain the rise of leader in the government with a record of unparliamentary behaviour and proneness to public expression of anger? Does it incite the masses to replicate linguistic aggression? Does it help the leadership to convey that it is a part of the ordinary rank and file, and thus claim a right to lead them? What does it imply for the emerging texture of democratic politics in the state? These are some of the questions we try to address in the paper.

**0525370 SARANGI, SURESH PRASAD (Department of Political Science, P.S. Degree College, Deogaon, Dist: Bolangir, Odisha). IMPACT OF SELF-HELP GROUPS (SHGS) IN SOCIO—ECONOMIC AND POLITICAL DEVELOPMENT : AN EMPIRICAL STUDY OF SIKACHHIDA GRAM PANCHAYAT OF BOLANGIR DISTRICT OF ODISHA**

Self-Help Groups are said to be instrument for rural development, poverty alleviation, and social empowerment in our country. Women are integral part of the development process of any country and to achieve this goal it is necessary to give an equal footing to women with their male counterpart in terms of capacities, access to resources and opportunities. Due to a number of reasons like, illiteracy, low work participation, conservative attitude of the male dominated society, status of women is very poor in developing countries like India and their decision making power and political participation as well as income generating activities is very low by which they have to depend on men. In the recent time, Self-Help Groups (SHGs) have emerged as the very powerful instrument in India through which women are getting empowered economically and socially. This study addresses women empowerment through self-help groups in Sikachhida Grampanchayat of Bolangir district of Odisha. The information required for the study has been collected from both the primary and secondary sources. The result of the study revealed that SHGs have had a significant role on both economic and social aspects of the beneficiaries.

**Key Words: Women Empowerment, Self-Help Groups, Income generating activities, Political Participation.**

**0525371 SHAHI, S P (, A. N. College, Patna). CHALLENGES OF POVERTY ALLEVIATION IN PRESENT INDIA: A CRITICAL ANALYSIS**

This paper tries to critically examine the fashionable concept of the present day development discourse, especially in relation to poverty alleviation in India. The poverty estimates are broadly consistent with independent evidence on per capita expenditure, state domestic product and real agricultural wages. As per the estimation by the Tendulkar Committee the number of Below Poverty Line (BPL) declined to 21.9% of the population in 2011-12 from 29.8% in 2009-2010 and 37.2% in 2004-2005. Globally, almost 385 million children were living in extreme poverty. At present, India is home to over 30 % of almost 385 million children living in extreme poverty, the highest in South Asia, according to a new report-2019 by the World Bank and UNICEF.

The analytical methodology will be used in this research study. Basically present paper will be based on secondary sources. Since poverty is defined as “the inability to attain a minimum standard of living” (World Bank), therefore it has been traditionally measured in terms of income or consumption. As 2016, the incidence of multidimensional poverty has almost halved between 2005-2006 and 2015-2016 declining from 54.7% to 33.8%. Since programmes for poverty alleviation have been integral elements of India’s development strategy, therefore, definition of poverty line is significant for measuring the magnitude of poverty in India. This paper also tries to

examine the various anti-poverty programmes which were implemented in India on an adhoc and isolated manner. But, why status of extreme poverty in India is serious than other neighbour's countries?

**Key words: Development, Extreme poverty, Below Poverty Line (BPL), Employment, Poverty Alleviation.**

**0525372 SHARMA, PRIYA (Jawaharlal Nehru University, New Delhi-110067). ROLE OF GANDHIAN SOCIAL MOVEMENTS IN REDEFINING AND RESTORING DEMOCRACY: A CRITICAL ANALYSIS OF EKTA PARISHAD**

It is argued that Gandhian Social Movements can play a major role in addressing, restoring and redefining the boundaries of democracy today. The argument is supported by insights collected from field work with Ekta Parishad in Madhya Pradesh and Chattisgarh, participation in Jan Andolan in 2018, a nonviolent march from Gwalior to Morena and a workshop conducted by Ekta Parishad in Madurai, 2019. Ekta Parishad began as loose grouping of NGO training institutes for creating a large base of community development work. It was in 1991 that it finally evolved as a federation for mobilizing people by nonviolent resistance. It carries out its struggle for introducing and strengthening three concrete models: community-based governance (gram swaraj), local self-reliance (gram swawlamban) and responsible government (jawabdeh sarkar).

The findings from the field suggest that Gandhian Social Movements like the one mentioned here are not limited to just putting forth a substantive form of dissent that highlight those different corners which represent a crisis in liberal democracy. These movements also offer a possibility of informed and constructive deliberation. The reason behind this is that the movement instill such positive values in its members that transform them from being suppressed and complacent subjects into able ( through enhanced understanding of public affairs) and willing ( through the perceived moral obligation to transcend narrow and short-sighted interests) political citizens. These empowered citizens are vocal about the crises in liberal democratic framework, they are active in holding the concerned authorities and institutions accountable and are also leading the way towards building a self-dependent society on nonviolent lines. In fact, it can be said that, the democratic make -up of the movement is a reflection of the larger vision of a society that they endeavor to establish.

It is to be mentioned here that although, largely the paper discusses the positive role of Gandhian social movements, with particular reference to Ekta Parishad, in a democracy, still when observed closely the very same movements could also subvert the democratic values if the members become misguided, selfish and compromise the basic ethics on which they stand upon. Moreover, Gandhian Social Movements have to be robust enough to transcend the walls of social and have a vision of articulating what is political and how it can be reproduced in reality. This is argued because Gandhi never made a distinction between the social and the political, which is why his was a holistic vision. The same is needed today if the democratic framework have to be rescued from getting reduced to a mere formal covering for authoritative tendencies of the social as well as political corners. Thus, a critical analysis of Ekta Parishad in the paper forms a significant part of the paper in order to advocate the major role of these movements in either enhancing the democratic fabric of the country or weakening the same, if they remain misguided.

**0525373 SHEIKH, AASIMA BANU (Handrabhaga Hostel, Jawaharlal Nehru University, New Delhi-110067). THE POLITICS OF NON-RECOGNITION: A COMPARATIVE STUDY BETWEEN ASSAM'S NRC AND BURMA'S CITIZENSHIP LAW**

Recognition in today's world comes in the forms of rights. The rights that are inevitable to oneself. The 'self' that is structured in the mutual recognition among the subjects. In the nation-state theory, this recognition is drawn from the state. The state that provides citizenship rights as an acceptance to the identity and recognition to the subjects. However, there is a lack of scrutiny with the sudden change in citizenship laws of many states like in India's Assam and in Burma on their mandate in providing a holistic approach to recognition. With the idea of acceptance to society, the need for recognition emerged. There is a demand for recognition in contemporary politics in a number of ways, in the form of human rights, on behalf of minorities, women, and children including animal rights and in the words of Charles Taylor what we called today as multiculturalism.



The paper, internalises the very essence of recognition for the people who were manufactured into the product of 'stateless' who are outcast from the aspects of multiculturalism, recognition and identification. In India, the process of National Register of Citizens (NRC) of maintaining a register that was created after the 1951 census is undergoing update for the first time in Assam. The register forms the part of a legal directory that includes names of the persons whose names existed in any of the electoral rolls of the assembly constituencies within the present-day territory of Assam up to the midnight of March 1971. The laid down purpose of the NRC update has aimed at identifying the citizens of India based on a paper to be existing since then. However, the process has led to the misrecognition of 4.1 million people on the mere account of documents which is impossible to retain. The validation of Indianness on the grounds of the old piece of paper and declaring millions of people as stateless is what comes closest to the incident of Burma's changed in citizenship laws of 1982 where millions of Rohingyas population has been debarred from the rights of citizenship on the mere basis of documents. Thus this paper will talk about both the state where the population has been rendered for no-one and no-where. And will discuss as to how powerful the state is, in making people human and less form of a human? The paper will demystify the motives of the state and the consequences of the stateless. And talk about the systematic theory of nation-state that failed in accommodating state and its people beyond the power manifestations. Thus, the question remains shouldn't there be any call for another nation-state theory for the "stateless"?

**Keywords: Rohingyas, NRC, recognition, stateless, Assam, Burma.**

**0525374 VIKRAM, VIJAY SHANKAR (Department of Political Science, P. C. Vigyan College, Chapra, Jai Prakash University, Chapra, Bihar). CHANGING PARADIGM OF DEVELOPMENT ASSISTANCE IN INTERNATIONAL RELATIONS**

This paper analyses the changing paradigm of development assistance in International relations in contemporary time. Betterment of democracy and economic reforms has been two major agenda of the development assistance in the post cold war world order. Some donor and develop countries or donor organizations have successfully implemented this agenda. But there was a shift in the outline of development assistance in the last two decades which is marked with some very important international events to reshape the international relations. Foreign aid which was always influenced by the political shifts in the international relation also underwent many changes. The agendas of promoting democracy and economic reforms were turned obsolete and new themes substituted them. This paper is helpful to know about those new themes.

The analytical methodology has been used in this paper. Basically, it is based on content analysis as well as secondary sources. Poverty alleviation always been a priority of the international development assistance but strong emphasis was given to the poverty alleviation only in the second half of the 1990s. *Rio de Janeiro* Conference, 1992 had linked development assistance with environment sustainability and provided the guidelines for the donor to make sustainable development as one of the primary agenda of the aid policy. Another turn came in the international politics after the terrorist attack on 9<sup>th</sup> Nov. 2001 in the USA. After this attack on the USA, international terrorism becomes the main agenda in the practice of international relations. Many international agencies have accepted poverty and political instability is the serious cause of terrorism and aid is shaped to fight with these causes. Now, free trade, globalization, liberalization etc. remained significant but containing and countering international terrorism became the core of foreign aid.

**Keywords: Development, Democracy, Economic reform, Foreign Aid, Globalization.**

**0525375 WARJRI, MANBOR SINGH (Department of Political Science, Sankardev College, Shillong). SOCIAL CAPITAL IN THE NORTH EAST: THE ROLE OF DORBAR SHNONGS IN MEGHALAYA**

Too much of a contrast of tradition and modernity has often led to a misunderstanding of the role of embedded practices and institutions in our society, especially those working in marginal locations. Among other things, it has closed the possibility of tapping into the indigenous resources for democracy, especially with regard to

the social capital that is peculiar to different regions. This paper attempts to mine such a resource in the institution of Dorbar Shnong. The Dorbar Shnongs in Meghalaya have played instrumental roles in terms of social development, political awareness and mobilisation, along with cultural preservation. They are actively engaged in local administration of justice in line with customary traditions and practices. As institutions they are apolitical and work outside the formal political domain but their role becomes very important and essential to any kind of political and economic activity in the region. Particularly, the application and implementation of different developmental schemes cannot take place without their support and cooperation. A unique feature of such institutions is that while the community elders play an advisory role in them, the immediate members of the Dorbar are democratically elected and they address all issues directly affecting or concerning the community. Issues are thus discussed at length and put to vote in an open air kind of parliament. Every Dorbar also has a correspondingly Seng Kynthei (Women's Wing) and a Seng Samla (Youth Wing) and all three institutions work hand in hand in the furtherance of the general interest of the community. The paper will discuss how they effectively function as a bridge and mediate the relationship between the political leadership and the people. It aims to elaborate on their practices and make a larger case for strengthening institutions like Dorbar Shnongs as critical elements in the social capital specific to regions like the North East.

## 26. PSYCHOLOGY

### **0526376 CHACKO, LIJIYA AND ATHIRA, P (Little Flower Institute of Social Science and Health). NORMS OF EQUALITY: STUDY ON TRANSGENDERS IN KERALA**

India's transgender community or trans-women has a long history as our civilization. Indian law recognizes trans-women as third gender but till date they are struggling for their identity. Socio-cultural exclusions along with economical and political status ostracism had made them circumstantial victims in the Indian society. The objective of the study is to investigate the current issues faced by transgender community in this globalised society on the grounds of education, political pressure, social acceptance, employment and various other issues. The study is an attempt to discuss the emotions and feelings of transgender, by studying the transsociety in Kerala. A series of personal interview session with 15 transgenders has provided data on the current state of the community. The qualitative study has used exploratory research design to discuss the facts related to the issues and struggle for their identity in the contemporary world. Major findings of the study focus on the attempts made by transsociety towards the irrational views of the external world.

**Keywords: Transgender, Equality**

### **0526377 GARG, RAJAT (Mohanlal Sukhadia University Udaipur, Rajasthan). SOCIAL MEDIA AND INDIAN SOCIAL PSYCHOLOGY**

21<sup>st</sup> century has emerged with many unique concepts of social relationships. Social structure of current society is not as it was two decades ago. The bigger part of world population, for which Strauss and Howe coined the term 'The Millennials' have played a great role in making this a slightly unique society. And the tool which made this possible is 'Social Media'. Internet is a revolutionary invention of mankind. Since then this technology has been introducing many patterns of social relationships in day to day life. Some of these are E-commerce, E-mail, instant messaging etcetera. In present time we can get many app-based services with just one click. One can learn, communicate, play, work at anytime at any place, without being in physical touch with another person. Although one might not wonder about these changes as it is a daily business now, yet, one can not ignore the fact that it has completely changed our lives compared to our forefathers. The effects of these services are well known, but my concern here is how these changes are affecting the psychology of the masses as well as the individual. This article addresses three aspects of the current social media trend:-

1. Impacts of social media on various social dimensions.
2. The role of social media in manipulating the human minds.
3. How social media can play a constructive role in society?

### **0526378 KAUSHAL, SAKSHI; DALIYA, BEENA AND HEENA M A (Psychology, Indian Institute of Psychology and research). PSYCHOLOGICAL DISTRESS AMONG CRIMINAL AND CIVIL LAWYERS**

Psychological distress in particular is experienced when an individual undergoes high level of stress that causes cognitive, physiological, emotional and behavioural problems. Civil lawyers and criminal lawyers both are exposed to environmental stressors like harm, threat and challenge which are dealt with using coping strategies and if the stress is prolonged and exceeds one's capacity for coping then psychological stress turns into psychological distress. This research paper aims to study the level of psychological distress experienced by criminal and civil lawyers. For the current study, a non experimental causal comparative research design was chosen. A sample of 60 lawyers (30 criminal lawyer and 30 civil lawyers) with minimum 5 years of experience in their respective fields was chosen using non random purposive and snowball sampling techniques. The participants were administered the Kessler psychological distress scale (K10). The results indicated that there was no significant difference between the psychological distress experienced by criminal and civil lawyers.

The study can be used to identify 'at risk' individuals practicing as civil and criminal lawyers. Preventive measures can be taken for those who have scores falling in the mild moderate and severe likelihood of developing any mental

disorder. The study can be used to understand the difference between the distress experienced by criminal and civil lawyers if any. It can be used to identify 'at risk' individuals and intervention strategies can be devised to improve personal and professional lives of such individuals.

**Keywords:** lawyers, psychological distress, Kessler's psychological distress scale

**0526379 KUMAR, JITENDRA (Division of Social Psychology, A. N. Sinha Institute of Social Studies, Patna). PSYCHO-SOCIAL PROBLEMS OF DALITS IN RURAL BIHAR: RELEVANCE OF AFFIRMATIVE ACTION PROGRAMMES AND NEED OF INTERVENTIONS**

Dalits have been discriminated, exploited, subordinated and physically segregated community in India. They are lacking education, employment, health facilities, land, and income and thus suffering from poverty, social discrimination and various forms of deprivations. Thus, they are facing several psycho-social problems such as anxiety, depression, abuse, sexual abuse, violence etc. due to that their cognitive competence such as thinking, learning, memory, problem solving ability and level of motivation have been affected. Hence, they are not able to take benefits of the existing Affirmative Action Programmes fully. Therefore, a specific intervention is required to implement those Affirmative Action Programmes. This paper explain what are the specific interventions required for the development of Rural Dalits and how Affirmative Action programmes will be made more relevant for their betterment? This paper is trying to explain this aspect through review of literature.

**Keywords:** Psycho-Social Problems of dalits, intervention, relevance of affirmative action programmes.

**0526380 SINGH, AKANCHA BENAYAK; DAMODAR, SUNITA K. AND NACHIKETH, B (Indian Institute of Psychology and Research). RELATIONSHIP OF EMOTIONAL ADJUSTMENT AND BURNOUT AMONG WORKING MOTHERS**

The present study explored the relationship between emotional adjustment and burnout among working mothers. Burnout is a psychological syndrome involving emotional exhaustion, depersonalization, and a diminished sense of personal accomplishment that occurred among various professionals who work with other people in challenging situations. The sample in this study was working mothers. A working mother can be defined as a woman with an ability to combine a career with the added responsibility of raising a child. There were 60 participants belonging to the young adult category working in four different sectors, namely, education, banking, hospitality, and hospital administration. The scales used for the study were Maslach Burnout Inventory for measuring the dimensions of burnout and the Emotional Adjustment scale developed to measure emotional adjustment among young adults. The analysis was carried out to test a correlational hypothesis. The results of the analysis showed that emotional adjustment is moderately and negatively related with emotional exhaustion and cynicism (-.49 and -.40 respectively) and moderately and positively related with the professional efficacy (.49). Thus the emotional adjustment and burnout have moderate and significant relationship.

**Keywords:** Working Mothers, Emotional Adjustment, Emotional Exhaustion, Professional Efficacy and Cynicism

## 27. SOCIAL WORK

**0527381 ANANDA, H. AND MURTHY, S VENKATESHA (Department of Social Work, P. G. Center, Bengaluru University, Ramanagara, Bengaluru). LIFE SKILLS EDUCATION AS A CUTTING EDGE FOR BETTER PROSPECTS OF YOUTH : A MICRO LEVEL ANALYSIS**

The cut-throat competition, unemployment, lack of job security, etc. are some of the major concerns for the educated youth and as a result, they are caught in the mad race. This new challenge requires immediate and effective responses from a socially responsible system of education. It has been felt that life skills education bridges the gap between basic functioning and capabilities. It strengthens the ability of an individual to meet the needs and demands of the present society imparting life skill training through inculcating life skill education will help youth to overcome such difficulties in life. Life skills as the abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life (WHO). This year, India Skills Report (ISR.*et.al*, 2019) along with many other reputed agencies stated that Employability continues to rise thus reaching a new high of 47% in the past 5 years. Organization for Economic Co-operation and Development (OECD) has launched the Future of Education and Skills 2030. (Report of Organization for Economic Co-operation and Development (OECD). Youth focused Life Skills Education and Counseling Services (YLSECS) program, trained teachers/National Service Scheme (NSS) officers to deliver Life Skills Education (LSE) and counseling services to college going youth in the state of Karnataka.

The aim of the paper is to know the importance of Life skill education for youth. Objectives of the paper is to know the importance of life skill education for youth, study the perceptions of youth about life skills, identify the problems faced by the youth to acquire Life Skills and to suggest suitable measures to overcome from the same. The descriptive research design has been adopted to find out the information about the factor and to draw attention to the areas that need the parents and teachers attention in pursuit of building proper life skills among youth. A structured questionnaire has been administered on 100 students between the age group of 18 and 21 years. This study is designed to inspect whether the greater importance of life skill education for youth has influenced in selected colleges of Bangalore city. The results indicate that life skill education is an extremely high significance for enhancing skill among youth. Majority of the rural students have high level of Life Skills and Value Education than the urban students. P.G students have slightly better Life Skills and Value Education than the UG students. Efforts are to be made to enable the education in a broader way with proper life skills education in the course of most viable usage of strategies.

**Key Words:-Youth, Competition, Life Skill Education, Employability**

**0527382 MURTHY, VENKATESHA S. AND CHANDRASHEKHARA, H. R. (Department of Social Work, Bengaluru Central University, Bengaluru). SOCIAL WORK RESPONSE IN REDUCING POVERTY THROUGH MIGRATION TOWARDS SUSTAINABLE DEVELOPMENT: AN EMPIRICAL ANALYSIS**

Migration is a potent poverty reduction approach for migrants themselves and their families. It can help families to improve their wellbeing through increased income and consumption. Migration affects multidimensional poverty, economic growth, employment and innovation which can have indirect effects on poverty. Economic migration models are based on the premise that people move if it improves their well-being and if they have the means to do so. Labour migration can have a direct, immediate and substantial effect on the poverty of migrants themselves due to increases in income.

This paper focuses on the socio, economic and cultural aspects connected to migration for the people in Indian context in general and Karnataka in particular. Further, it emphasize on outcome of these factors lead to migration in reducing poverty. As a sample, how some selected areas of Karnataka have been preparing to achieve keeping in view of the agenda of 2030 sustainable development. The contributions of government welfare programmes, NGO initiatives etc., will definitely give a clarity in shaping the bright future of the poor by reducing poverty. In this connection, how the preparations are moving ahead has been presented in the paper. The influence

of many welfare programmes initiated by the Government of India and Karnataka and the present status of the poor people were also been analyzed. Social Work as earmark with its own methods and techniques in responding to the social realities with special emphasis on reduction of poverty through migration has mainly been touched upon in this regard.

The authors try to find out the problems related to the topic after necessary study undertaken of the present situation in selected areas and suitable measures were given to overcome from the problems from social work point of view.

**Key Words: Social Work, Poverty, Migration and Sustainable Development**

**0527383 MURTHY, S VENKATESHA (Department of Post Graduate Studies in Social Work, Bengaluru Central University, Bengaluru-560001). LABOUR WELFARE MEASURES IN SELECTED PUBLIC AND PRIVATE SECTOR INDUSTRIAL UNITS IN BANGALORE: AN EMPIRICAL STUDY**

Labour Welfare measures have drawn the attention of public sector, private sector and multinational corporate. It is in this context the money spent and work environment created for the benefit of the employees never goes waste. An employee who gets maximum benefit other than his emoluments may become a productive employee. These measures have been gaining significance with regard to the working class both in Public and Private Sectors.

The descriptive research was conducted to find out the information about factor and to spotlight the areas that require management's attention connected to comparative analysis of public and private sector units on labour welfare measures. As many as 250 employees with 125 each from the selected organizations working in two similar manufacturing engineering industries situated in Bengaluru of Karnataka have been covered under the study. Analysis involved in estimating the value of unknown parameters of the population and testing of hypothesis for drawing the inferences. Keeping in view of the awareness, implementation, utilization, satisfaction, problems faced etc., the hypothesis was designed. The Interpretation refers to the task of drawing inferences from the collected facts from an analytical study. Personal visits are made to both the organizations. In the present study, BEML and L&T Equipment Ltd., are taken as the unit of study and almost all the facets of welfare measures have been studied in.

The main objective of the study is to inquire into the perceptions, practices and aspirations on employee welfare measures provided to employees and the specific objectives are (a) To study the perceptions and attitudes of the sample respondents on labour welfare measures (b) To identify the gaps, if any, in the implementation of labour welfare measures in chosen industrial units and (c) To suggest suitable measures in the light of empirical results to reform the implementation of labour welfare measures.

The author has made an attempt to venture the task of observations of the employees of the selected areas in order to understand the implementation of employee welfare measures and analyze their views with regard to their satisfaction, welfare of the employees, problems faced and various measures to encounter the troubles etc. The results indicate that the provision of labour welfare measures have been helpful for many employees in increasing their morale and loyalty. Majority of the employees were highly benefited with the welfare measures. The necessary Improvements keeping in view of changing trends, practices and aspirations of the employees through innovative welfare measures need to be taken care of. This will help the employees to adjust and cope up with changing trends and developments of the society.

**Key Words: Labour Welfare Measures, Productivity, Wise investment, Public and Private Sector**

## 28. SOCIOLOGY

**0528384 ACHUMI, ILITO (Centre for Sociology and Social Anthropology, Tata Institute of Social Sciences, Guwahati Campus, Tetelia Road, Jalukbari, Guwahati, Assam). REMEMBERING THE PRESENT: THE NAGA MIDDLE CLASS NARRATIVES**

The Paper considers changes in socio-political values and uncertainty in ethnic identity as a consequence of recent economic and political upheaval of the Nagas of Nagaland. The present paper is a part of ongoing research among the Nagas. This paper investigates the influence of ethnic identity and ideological dilemmas of the present political engagements of the Naga Middle class. Using a range of methods, especially oral history and narratives, the paper considers the influence of collective memory and emotions tied to a group's past history and its implications upon current conceptualisations of identity. The paper consists of overview of literatures, especially the past three decades, pertaining to the Nagas. It is pertinent to note here that the narratives and oral history from the field scrutinizes the texts written about them. The paper maps the history of how the World War, the British, the missionaries and the state impacts upon the identity of the Nagas today. The paper also examines particularly the relationship between collective identity, present politics and the State; the role of memory and remembering in the identification processes. The final section of the paper studies the legitimation of the traditional elites in the contemporary modern citizenship, in upholding ethnic representations of the Naga modern society and it further examines the conditions under which they participate in the political life after the birth of a new state in 1963 and post 1990s. Focusing also on the range of socio-political contexts, the papers considers the current conditions under which these indigenous people's past is remembered to fit into the present Naga politics, which shapes and guides the current social practices and political ideologies of the present Naga Middle class.

**0528385 AMBEDKAR, PINDIGA AND REDDY, A. BHEEMESHWAR (Tricontinental Institute for Social Research, New Delhi). SOCIAL REPRODUCTION OR MOBILITY: EVIDENCE FROM PUBLIC AND PRIVATE EDUCATIONAL INSTITUTIONS**

Higher education is one of the major factors for social mobility in India. It has contributed in a crucial manner for the poorer sections of the population to gain access to newer forms of employment. In a radical shift from caste assigned jobs, higher education opened entry into professions for the deprived sections of the Indian society, the Scheduled Castes, Scheduled Tribes and Other Backward Classes. This was reflected in the increase in the enrollment of deprived sections of the population into the public higher educational institutions in the 1990s. Further, in the same decade, the OBC reservations were introduced in government employment. This acted as a pull factor for the OBCs to enroll into higher educational institutions.

But simultaneously, the government also introduced the neo-liberal policies in higher education. The state governments were encouraged to privatise higher education. Professional education (engineering, medical and management) was privatised and many private colleges were opened. Private education created its own ecosystem and the cost of education increased manifold. In the absence of any mechanism for the deprived sections of the society in gaining access to these private universities and institutions, it becomes important to assess the impact of privatisation of higher education on the questions of inclusion and diversity. This paper attempts to look at diversity with respect to caste, class and gender in the elite private institutes where the fee structures are high. We next compare the private institutions with the public institutions which have implemented affirmative action.

**0528386 BANERJEE, SUPURNA (Institute of Development Studies, Kolkata). GENDERING NETWORKS, GENTRIFYING CITIES: CONSTRUCTION WORKERS' PERSPECTIVES ON 'MAKING KOLKATA'**

A city is commonly understood through its infrastructure of modes of provisioning. Cities are, however, not inanimate objects—a site on which social processes simply unfold. Rather they are the very repository of such social processes influencing and being influenced by them. Infrastructure is thus not just 'structures' and 'facilities' but also lived experiences—it is constitutive of negotiation, challenge and even subversion of expected use. This paper engages with one of the less discussed aspects of urbanisation in the Indian metropolises – that of the relational

sociality of infrastructure and the possibilities of extending its meaning beyond the physicalist understanding through ethnography of labour haats in various parts of the city. These haats are sites where construction workers of various categories gather to be hired by contractors or individuals for work. The paper looks at the haat not only as an infrastructural site but also as an assemblage of practices, perceptions, experiences, skills, hierarchies, and zoning. Focusing on the transient (and transitory) location of the construction workers in the haats who either commute daily or migrate to the city temporarily, the paper illustrates how these are not just sites of network making and selling labour, it is also the site through which these workers understand and access the city. The character of the haats is not replicable across different sites of the city, mapping onto and shaping specific zones. The perceptions of the workers who access and perceive the city through these haats provides some clues to understanding the gendering and gentrification of Kolkata through the labours of the construction workers.

**0528387 BERI, SURAJ (Department of Sociology, Indraprastha College for Women, University of Delhi, New Delhi). BUSINESS OF POLITICS: EXPLORING POLITICAL ELITE FORMATION AND SOCIAL INEQUALITY IN BIKANER CITY**

Contemporary societies are characterized by widening social inequalities. In spite of the fact that many social institutions in Indian contexts have opened themselves for hitherto marginalized groups, social inequalities have increased. The mainstream trend, shaped by the economic assumptions, is to associate inequality with poverty. Now this might sound good enough economically and technically, it raises crucial and deeper sociological questions. The popular association of inequality with poverty tend to mask the social and economic functioning of privilege in the given society. The larger political discussion, then, centres on formulating statistical solutions to the problem of poverty and distracts any critical scrutiny on *engines of inequality* i.e. elites. Hence it necessitates a sociological investigation of how power and privilege is organized socially, politically and culturally. In this backdrop, this paper examines the nature of political field in Bikaner city. This paper deals with the question of social mobility and renegotiation of power relations within the elite sphere. Drawing on the empirical work, emerging out of researches doctoral research, it shows that political elites restructure the field of power by developing new sources of mobilization and closure. The paper would also consider the growing fragmentation in the elite sphere. It argues that changes in the structure of power in Bikaner challenge the 'rise of plebian' hypothesis and the popular pluralist discourses on politics in India.

**0528388 BHARGAVA, RASHI (Department of Sociology, Maitreyi College, University of Delhi, New Delhi). PRODUCING THE 'SELF', CONSUMING THE 'OTHER': LOCATING THE NEIGHBOURHOOD THROUGH EVERYDAY INTERACTIONS WITHIN NORTH EASTERN FOOD SCAPE IN DELHI**

Food as a window to the cultural system (meanings, values, beliefs and rituals) of any society has largely existed as a significant area of research. However, in the present paper, production and consumption of food is established as an entry point to understand the changing dynamics of urban space in Delhi. With an expanded market economy of dining out and the growing consumerism related to food, one cannot look at food only in terms of its religious significance or its nutrient values. Rather one has to place it as part of a larger food scape where food preparation, presentation, marketing and consumption can locate one within a social space and not only alter social relationships within that space but the space itself. Thus, food scape houses a complex of social relations and power dynamics between individuals and communities (caste, racial, religious and ethnic groups) which is not only shaped by but also shapes social structures, economic considerations, political compulsions and global interventions. The study is located in the Humayunpur area in the city of Delhi which is predominantly inhabited by migrants from various states of North-east India. With a changed demography and new market possibilities resulting from the liberalisation of Indian economy, the neighbourhood has recently emerged as a hub for 'authentic' north-eastern cuisine alongside Nepalese, Tibetan and Korean cuisines. The present paper thus begins with an interrogation into various factors that aided the restructuring of Humayunpur from the physical space of an urban village housing migrant communities into a 'centre' for north-eastern (also south-east asian) cuisine frequented also by communities often referred to as those from 'mainland' India. By looking at the everyday interactions between owners, residents and consumers, the paper explores these ever-changing social relationships, the predominant being that between the (Indian) centre and the (north-eastern) 'periphery'. It ends with the proposition that factors such as migration



processes, expanded economy and new consumption patterns have not only led to a massive reorganising of the physical space but have also played a significant part in altering subjectivities of the people inhabiting that space (North easterners in this case) along with the change in perceptions of people (non-north easterners) frequenting that space.

**0528389 BHATTACHARYA, AKASH (School of Education, Azim Premji University). THE ANXIETIES OF COLONIAL EDUCATION: “PETTY ENGLISH SCHOOLS” IN NINETEENTH CENTURY BENGAL**

Historians of education in India have often limited themselves to examining genealogies of education policies and to writing institutional histories of historically significant universities. The task of posing a range of sociological questions pertaining to processes and outcomes of school education historically has been left half-done. The failure can partly be ascribed to the persistence of linear state-centric approaches in studies of colonial education. Such approaches have held us back from appreciating the nature and extent of tensions between the colonial state and Indian communities over questions of educational goals, policies and their implementation. Our understanding of the effect of these tensions on the institutional landscape of colonial education have also remained deficient.

This paper takes a step towards addressing these insufficiencies. We critically examine a key fear that plagued both colonial and Indian reformist activities in education throughout the colonial period: that of the sprouting of “petty English schools”. In brief, it refers to a phenomenon whereby Vernacular Schools aided by the state, where teaching English was officially disallowed, were converted by Local Committees into English-teaching schools where English was taught either as an additional language or used as the medium of instruction. Colonial education manufactured a hierarchy between English and local vernaculars; the linguistic hierarchy was mapped on to the institutional structure of colonial education. The “petty English schools” hence posed a challenge and compelled colonial officials and elite Indian reformers to look for ways to both neutralize and accommodate the challenge.

We examine the fermentation and attempted resolution of these tensions in the first phase of colonial education reforms in Bengal, between c.1854 and c.1882. We foreground the ruptures it caused in education policy and the new institutional forms that it gave rise to (e.g. the Anglo-Vernacular Schools). We hope that an interesting historical parallel to contemporary issues in education will refresh conversations about the place of history in educational research.

**0528390 BHATTACHARYA, SHREYA (Department of Sociology, TBESC, Kolkata). DECODING FABLES: A SOCIOLOGICAL STUDY IN EXHIBITION OF GENDER IMBALANCE IN CHILDREN’S LITERATURE**

The familiar and traditional fairy tale often seems a storehouse of values and behaviour that are culturally acceptable. “In this sense, it forms an imaginary world which reflects the same process of defining differences and distinguishing categories by which we construct and apprehend the world around us. These fairy-tale distinctions may extend from good and evil to rich and poor, to earthly and sublime, to male and female and moreover, often falls within the guidelines of established social morals and mores. It becomes, if not a pedagogical tool to instill cultural values, and often a means of enforcing the status quo, then certainly the narrative voicing of a society's most pervasive patterns of belief, behaviour, and conviction” (Brockleback, 2000).

Fairy tales have been the most fascinating part of a child’s growing up years and children have consumed far more than just the outline of the stories. They learn values, behavioural and associational patterns and consequences of actions. These stories also reveal a picture of roles, behaviour, and psychology and fate according to sex and all this they gather from the princes, princesses, wood cutters, witches, and fairies of their favourite tales.

Now if we examine these tales we could observe a similar trend in all where the treatment of women have followed a certain pattern which could be an influence to create sexual role concept in the young developing minds and also suggesting shortcomings on a person's endeavours depending on the sex. Hence the paper explores the possibilities of such mechanisms as a product of biology or forced acculturation and how women all over the world have formed their psycho-sexual self concepts, ideas on what they could achieve and what they could not, and what kind of behaviour is applauded and what kind is frowned upon, from their favourite fairy tales.

**Keywords: behaviour, gender, women, passivity, sexuality, identity, categories, traditions, culture**

**0528391 BORA, SIMASHREE (Jyoti Dalal School of Liberal Arts, Narsee Monjee Institute of Management Studies, Vile parle, Mumbai). GENDERED LEGACY AND DEVOTION WITHIN NEO-VAISHNAVISM IN ASSAM: INTERPRETING GENDER AND CASTE THROUGH WOMEN'S STORIES**

This article investigates how certain prevalent narratives of three women unravel complexities related to Vaishnava legacy and gendered devotion within the monastic order of neo-vaishnavism of Assam. Legends, stories and life-histories of Sati Radhika, a lower caste woman and Padmapriya Aai, the first Assamese woman poet, tell us more about representation of caste and gender dynamics both in literature and popular understanding. Similarly, story of Kanaklata Aai tell us about female legacy and descendants within Vaishnava order. Reflection on these women and their roles will bring out the convoluted interplay of caste and gender, which is otherwise a neglected subject. The paper does not limit its scope by focusing on the legacy of women devotees who had access to the monastic system by virtue of being the descendants of the Vaishnava Gurus, rather it tries to locate these stories within the larger understanding of gender in the structured space of neo-Vaishnavism. Sati Radhika and her story reflects on the domains exist beyond the nexus of Vaishnava descendants and their legacies. Her story questions various aspects of the Assamese society growing within the precinct of Sattras and the existing feudal structure. Thus gendered devotion provides a critical outlook to understand exclusion of women not only within the religious and spiritual domains of Vaishnavism, but also how they often come in conflict with women outside of it. The article argues that representation of female devotion within Vaishnavism is based on gender and caste norms, structured through popular narratives, both oral and written, legitimated under the precincts of institutional structures.

**0528392 BORBORAH, PRATISHA (Maitreyi College, New Delhi). PARTICIPATION OF WOMEN IN A KARBI PERIODIC MARKET IN ASSAM**

This paper explores the role of women in the Karbi periodic market in Assam with reference to the 'household debate' around the idea of 'headship' and 'bargaining power' in a family Headship here refers to chief economic provider, the chief decision maker, the person designated by members as the head that had been assumed to be male. Feminist studies on work and the household has challenged this and unearthed a rich body of scholarship to substantiate this over the last four decades.

It is in this context that one seeks to look into a market space not only as an economic but as a social category. The Karbi market in Guwahati is a weekly market controlled by the Karbi community residing in Khepinijal village. The market has a mixture of both men and women involved in different activities. But one can easily see the visible role of tribal women in the market. These women belonging to different tribal communities of Assam like Bodo, Karbi, Mising who regularly come to the market travelling from different rural areas to sell their commodities. However, their participation in the economic sphere is limited only to selling their commodities. Although most of the vendors in the market are women, they appear to be controlled by their husbands, sons or the market administration. This again brings the question of the close relationship between the private and public in defining women's role in sectors like periodic markets.

The paper will try to explore the different dimensions of women's every day participation in the periodic market. It will focus on the ways that the state, society and how the community impacts the position of women in the market.

**0528393 CHAKRABORTY, DEBARATI (Department of Sociology, Jhargram Raj College). THE EXCLUDED EXPERIENCES OF DISABLED MEN: EXPLORING THE ISSUES OF MASCULINITY AND SEXUALITY THROUGH A FEMINIST LENS**

Gender and sexuality concerns of people with disabilities are explored less in academia, though few works have discussed about the double marginalisation of women with disabilities but not much details are put forward for men with disabilities, they too are the invisible victims of patriarchy. The everyday gendered experiences vary for men and women and the intersectionality of caste, class, sexuality, disability shapes their experiences in more complex ways. Marginalisation of men came to notice with Gay liberation movements in 1970s which became politicised as new feminism movements and started highlighting the plight of homosexual men excluding the experiences of disabled men, who are also somewhere on the margin. Like homosexuality, disability too is considered as a threat or risky to hegemonic masculinity.

Against this background the main Objectives of the paper are-

1. To explore the everyday challenges and how it has affected the construction of masculinity among disabled men.
2. How do they negotiate spaces with abled bodied men and women
3. To Explore the perception of sexuality and violence

For the purpose of the study, 30 young adult males with physical disabilities within the age group of 18-35 years were interviewed and sample was chosen using convenient and snowball sampling techniques in areas of Kolkata. The study puts light on the marginalised way of living and the various ways these men are being placed in position to hegemonic masculinities which have different layers of invisibility. Therefore, the construction of masculinity and sexuality differs with individual experiences, the degree and type of one's disability which is expressed through their personal narratives.

**Key Words: masculinity, sexuality, disability, marginalisation**

**0528394 CHATTERJEE, ANASUA (Department of Sociology, West Bengal State University, Ramakrishna Sarada Mission Vivekananda Vidyabhavan). DIVERSITY AND THE CITY: THE CASE OF KOLKATA'S MUSLIM NEIGHBOURHOODS**

This paper explores the ways in which existing 'differences' between social groups often get reconfigured and hierarchized into relationships of inequality within urban contexts of contemporary India. The paper identifies threat perceptions regarding the presence of the 'other' as a significant factor in this process and argues that specific situations of threat radically alter how people evaluate and moralize about differences. Such moralizations may work towards establishing new or reinforcing pre-established moral hierarchies which express themselves through symbolic and/or spatialized means evident, among others, in the dynamics of neighbourhood formation. This is done by presenting the case of the 'Muslim' neighbourhoods of Kolkata, which, like those in many other Indian cities, have acquired visible ghetto-like attributes with their 'Muslim-ness' standing out as the primary marker of identity and which, in their contemporary forms, are a far cry from the 'sub-communal' Muslim settlements that once dotted the colonial city. The paper builds on narratives around Muslim-ness which emerged in Kolkata during the tumultuous years around Partition and Independence to highlight the ways in which Muslims came to be construed as the veritable 'other' of the Bengali Hindu 'self'. Categories applicable to Muslims were automatically extended to characterize the spaces they inhabit so that, in popular urban psyche, Muslim predominant neighbourhoods came to be viewed as 'unknown' and 'dangerous', as 'sites of threat' which best kept at a distance from urban mainstream. Drawing from narrative ethnography the paper explores the consequences of continued socio-spatial segregation for Muslims themselves in terms of their access and sense of belonging to the city as well as for locating the broader question of diversity in the South Asian city.

**0528395 CHHETRI, NILAMBER (School of Humanities and Social Sciences, Indian Institute of Technology, Mandi, Himachal Pradesh). SCHEDULING GROUPS AND DEMANDS FOR REGIONAL RECOGNITION: ETHNO-FIELDS AND QUEST FOR CULTURAL AUTHENTICITY IN DARJEELING**

The nature, character, and contours of ethno-politics in Darjeeling have undergone tremendous change since the turn of the 20th century. At the core of these demands lay a relentless quest to assert one's belongingness to the nation-state and to the region. Tracing the trajectory of these demands this paper explores the contested nature of ethnopolitics unfolding in Darjeeling. The paper attempts to unravel the intersection between demands for scheduling of groups as tribes and inclusion of the region under the ambit of sixth schedule. In this connection, the paper examines how such intersections are discursively framed in the language of cultural authenticity. Exploring these vexed issues, the paper tries to show how the idea of North-East is extended by groups living in Darjeeling to assert their rights and entitlements from the state. In this regard the notion of North-East is extended beyond territorial confines to embrace the discourse of rights and recognition. The paper argues how such perennial quest for scheduled tribes' identity among ethnic groups in Darjeeling indicate a quintessential struggle to attain recognition as citizens, and re-inscribe their agencies as indigenous inhabitants of the region.

**0528396 CHOTANI, SUPRIYA (.....). NEW MEDIA ECOLOGY, FREE SPEECH AND REGULATION IN CONTEMPORARY INDIA**

Since the opening of private television news space in India and the arrival of social media, the notion and practice of free speech has been under constant scanner and debate. From corporatisation and sensationalism in news, to social media trolling, hate speech, misinformation and fake news, as well as the emergent politics of attention economy, data profiling and privacy, newer challenges to free speech surface with every passing year. How should we normatively define free speech in this transformed media ecology? Should it be regulated? More importantly, can it be regulated, and who should regulate? These are some of the questions that this paper would engage with, by way of two case studies: the regulatory debates in the last 15 years on *private news media* and *social media* in India. News regulation in India has had a chequered history but post liberalisation, the issue stirred up in relation to the longstanding efforts to pass the Broadcast Bill. Given the state of news today, questions are routinely asked on the efficacy of self regulation, but any proposals of government regulation thereof are also vociferously opposed on concerns of free speech. Similar dilemmas can be seen in social media space, and the last decade has seen recurrent contests between governments and tech platforms, who both claim to be the true arbiters of free expression and public interest in a democratic context. By way of these case studies, the paper attempts to revisit and review some of the theoretical underpinnings of interrelated constructs of freedom of expression, public sphere and public interest, and how these bear in the context of our current media environment.

**0528397 DALUA, PRAVATI (Department of Sociology, Kamla Nehru College, New Delhi). UNDERSTANDING 'ENTREPRENEURIAL SUCCESS' IN SMALL BUSINESSES: A CASE STUDY OF THE DARJI COMMUNITIES OF ODISHA**

There has been a growing body of literature in recent years, acknowledging the importance of artisanal business in developing economies that represent a way of life, provides employment opportunities while contributing to the alleviation of poverty. However, the concept of 'entrepreneurial success' for artisanal businesses has not yet been well established in literature. Most studies confine the idea of 'success' in terms of financial attributes of the business enterprises. However, not all businesses can be measured with the same indicators of success which is specifically true of the socially embedded business enterprises having a long cultural history. This paper addresses this issue by assessing how socially embedded applique craft industry in Odisha define and achieve business success in their own cultural context. For this exploratory research, in-depth interviews were conducted with applique entrepreneurs engaged in hereditary handicraft production. The present study found that many factors separate the artisan entrepreneurs from their other fellow beings such as education, hereditary occupation, technology, commercialization into international markets etc. In contrast, socio-cultural attributions such as religion, caste, local perception of 'good' life define their goals of trade and motivation to get into and stay in business irrespective of the volatility of market.

**0528398 DAS, MITOO (Anthropology Faculty, Indira Gandhi National Open University, New Delhi). WE BECOME WHAT WE EAT: MANAGING IDENTITY (IES) THROUGH FOOD**

Food is so mundane an element in our daily lives that we do not realize the intensity with which it influences us socially, culturally and politically. Food, the way it is created, served, consumed and conserved, has not just health and nutritional ideals associated with it, but are also manifested in symbolically giving meaning to one's identity. This paper is an auto-ethnographic attempt to understand how with movement from one space to another, in this case from Assam to Delhi, food behaviour may undergo severe changes. These changes may be such that it exhibits the dominance of the space and culture inhabited at present. Along with the space, the author's marital alliance with a different (Bihari) culture, has also introduced some major/minor additions to her already existing food routine. This added to the dominion of a space displays the penetration of a way of life other than one's own attempting to produce multiple identities. This paper also attempts to discuss how in the "acculturated" scenario mentioned, the author tries to still maintain her individuality as an Assamese by sticking to her native food habits, either by creating or consuming them. This need to stay connected to her native food culture is also delved into in this paper. This auto-ethnographic piece as a whole is a self-reflexive piece to understand how food plays a distinct role in creating an "own" in an "other" space and culture thus bringing in varied aspects of migration, caste, class, gender etc. and their existence or otherwise in the framework of food.

**0528399 DASH, ROMA RANU (Department of Sociology, Utkal University, Vani Vihar, Utkal, Bhubaneswar). RISK, VULNERABILITY AND DEVELOPMENT: A STUDY OF A FISHING COMMUNITY IN COASTAL ODISHA**

Certain communities have always been at risk due to reasons that are beyond human capacities or for reasons that may be called "man made". Fishing communities along the long coast of India in general and of Odisha in particular are some such communities which confront nature and live on the conditions of risk on an almost everyday basis. However, the vulnerabilities inflicted on these communities by the nature, in recent times due to the neo-liberal model, are compounded by the man-made interventions such as modernization of ports, industrialization of coastal corridors etc. that make these communities further vulnerable and even threaten their existence in their native land which have been inhabited by them for decades. What is significant in the study is that the different strata of the fishermen devise different strategies to deal with risk and vulnerabilities. In other words, what is striking is that its impact differs from one section of the fishing community to the other. Basing on these problems, a study has been conducted in the Sandhakuda village in Paradeep in Odisha. The study has been informed by purposive sampling based on in depth interviews conducted in the Sandhakuda Village which is a home to number of traditional fishermen engaged in marine fishing.

The study focuses on understanding the multiple risks the fishing community of coastal Odisha confronts, which leads to their marginalisation. These risks can be called "external" and "manufactured risks" as discussed by Ulrich Beck (1992) and Anthony Giddens (1999). The paper discusses the theories of the development, particularly the theory of modernization and the neoliberal theories of dispossession. The risk and vulnerabilities which the fishing community of Sandhakuda faces is the product of an overall project of the government that is based on measuring development in terms of growth, modernization and the gradual mechanization of the sector. Though economic reforms have opened new opportunities that were previously not available, to make use of these opportunities, social and economic facilities also need to be enhanced so that all sections of the population can make use of these opportunities. In the case of the fishing sector, the entry of business houses said to bring with it a lot of opportunities such as the introduction of new crafts into fishing. But this is of not much help to the fishing communities as there are no subsequent facilities so that they can enhance their income and the way of living. Instead of helping these communities this causes serious encroachment in their waters and a reduction in their catch.

**0528400 DEVI, NINGTHOUJAM SOMOLA (Department of English, N.B. College, Manipur). MEITEI REVIVALISM AND THE CHANGING MANIPURI SOCIETY**

No society can live in isolation when the world has become a global village. It is impossible for any society not to undergo social change. The Meiteis of Manipur has their unique language, scripts, sculpture, custom, dance, music, drama, literature, painting, folktales and religion that asserts the identity and the existence of the people. Manipur was a sovereign country having its own constitution before India got its independence. It has its own political history which is nowhere to be found in our study of Indian history prescribed in our school curriculum. Manipur went through different phases of political and cultural colonization which become intolerable during the reign of King Garibniwaz. Politically, the Meiteis suffered in the hands of Awa (Burmese) for seven years which in Manipur is known as Chahi Taret Khuntakpa (Seven years Devastation). And with the patronage of the kings the Meiteis were converted into Vaishnavism. As a result of this, the Meiteis who were not converted try to revive the ancient way of Worshipping. The Meiteis today try to deconstruct the history of Hindunization. This led to the Meitei Revivalism - to preserve and safe-guard the language, the scripts, the tradition and culture of the people. With it, we also witness different non- government organizations reinforcing certain norms towards the people resulting in some kind of power politics. But beneath all these there lies a very noble reason - that of safeguarding the integrity of the people, the culture and tradition and of the language that has been there before Manipur annexed to India. This paper will highlight the nuances of the Meitei Revivalist Movement in relation to the political and cultural history of Manipur.

**Keywords: Meitei, Culture, Religion, Political History.**

**0528401 DEVI, SUDESHNA (Center for the Study of Social Systems, Jawaharlal Nehru University, New Delhi-110067). FRAMING MEDIA NARRATIVES: A STUDY OF NDTV 24X7 AND AAJ TAK**

This paper takes its cue from the idea that media is a key agency in framing public opinion in democratic societies. Media derives its power and influence from its capacity to frame and shape opinion on everyday issues and events. Situated within the framework of Stuart Hall's 'politics of signification', the paper seeks to understand and analyze the role of television news media in signifying and framing discourse on social, political and cultural issues in the public domain. This is achieved by doing a textual analysis of some current affairs programs in two private news channels NDTV 24x7 and Aaj Tak. The current affairs format of news programming is one, where news commentators debate, discuss and analyze current events through studio debates and panel discussions. Such discussions are framed, from certain ideological, political, cultural, religious perspective. This could be consistent with either their personal beliefs, or the organizational policies or their target audience. The influence of either one of these factors or amalgamation of more than one factor, gives rise to similar as well as dissimilar 'discourses' by the two media networks. These mediatized narratives in turn, signify the crucial role of television news media, in shaping and influencing the nature of public discourse in contemporary India.

**0528402 DUNGDUNG, DEEPALI APARAJITA (Centre for the Study of Social Systems, School of Social Sciences, Jawaharlal Nehru University, New Delhi-110067). MAKING OF CARE WORKERS IN INDIA: A MAPPING OF STRUCTURES, INSTITUTIONS AND PRACTICES**

Across the globe we find that women's economic roles are encapsulated in certain professions that are believed to be close to their gender roles. Care work or social reproduction, including the plethora of activities and services that reproduce human beings and labour power, is rudimentary to understanding women's economic and social roles within societies. Further, the present-day composition of the care workforce globally indicates a skewed representation of women belonging to specific races, nationalities.

The relegation of the task of social reproduction to women is a product of the historical transformations and changes in the organisation of production and social structure of societies. The coming about of industrial capitalism impacted women's role within the economy and society, creating binaries of the public and the private. However, in the context of a country like India the changes brought about by capitalism were enmeshed with those brought about by Colonialism. Women's economic activity in such a situation then has to be viewed in the backdrop of both capitalist development and colonialism. Having said that this paper would try to explore women's economic activity in India, more than often remains unregulated and undervalued, of which care work occupies a central position. While these transformations get reinstated in the contemporary context of globalisation and liberalisation it is

necessary to understand this process of transformation historically from the period of colonialism which I identify as the period of India's tryst with modernity in terms of modern science and technology.

In this light, this paper shall attempt to outline the historical trajectory that lead to women increasingly participating in low paid care work in India, with an emphasis on tribal women from Chotanagpur (parts of present-day Jharkhand and neighbouring states of Chhattisgarh, West Bengal, Orissa). It shall try to locate the role of different social institutions, practices and structures that enable the process of making women 'workers' in the care workforce.

**0528403 GAURAV, SUSHANT (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi-110067). NON-GOVERNMENTAL ORGANIZATIONS AS AGENTS OF DEPOLITICIZATION: POLITICAL ECONOMY OF DEVELOPMENT**

'Development' has become the central theme that both configures and constitutes the process of governance. It serves as the meta-narrative that entails a specific model of arrangements of socio-political institutions. Consequently, neo-liberal model of governance has entrenched its scope in the discourse of 'development' and developmental practices. Retreat of the welfare state has accentuated debates pertaining to efficacy and effectiveness of state and this observation might lead one to a foregone conclusion that market has usurped the void foisted upon through retreat of the welfare state. Yet, it is not the obvious usurpation that is startling, rather it is the processes, mechanisms and strategies deployed in and through neo-liberal model of governance that assumes greater relevance. One of the components of such processes is the exponential proliferation of Non-Governmental Organizations (NGOs). In India, their number rose from some 80,000 in 1980s to 3.1 million in 2015. This growth is co-terminus with economic reforms initiated in 1991 that laid the foundation for liberalization, privatization and globalization.

Development discourses hold NGOs as the representative of grassroots and thus are considered to be being a vital cog in participatory democracy. They not only partake in formulation of various policies of state but also functions as agencies for delivering governmental schemes at various levels. It is interesting to note that India does have local governance structures precisely geared towards eliciting grassroots participation and ensuring effective delivery of services. Besides, Panchayati Raj institutions and Urban Municipalities were accorded constitutional status in 1992. The obvious question arises as to why NGOs are required when there are governmental institutions in place. It calls for analysis of this apparent anomaly. NGOs serve as an extended tool for governance and also as nodal points for market. Unlike governmental institutions, NGOs aren't accountable and thus leads to privatization of public sphere. In other words, it might be said that increasing NGOisation vitiates social contract. Their mode of engagement in reality reduces structural 'issues' to individual 'problems'; socio-political issues to techno-managerial problem which could be solved by experts. Effectively, NGOs bring about depoliticisation instead of participatory democracy.

**0528404 GAUTAM, MEENAKSHI (.....). GENDER, MEDICAL EDUCATION, AND SPECIALIZATION IN INDIA: PREFERENCE AND CHOICE**

The increasing enrolment of women in the discipline of medicine in India is a welcome trend. However, within medicine the maximum number of women are pursuing nursing which is seen as a low status female dominated occupation. There is a dispersion as well as concentration of women doctors in only a few specialties such as gynaecology, obstetrics, paediatrics and non-clinical branches. There are relatively very few women as compared to men in specialties like orthopaedics, cardiology, urology, forensic science, neurosurgery, nephrology, gastroenterology and nuclear medicine. What lead women postgraduate students to make specialisation choices is an unexplored area. The present study conceptualises choice-making as a complex process and often choices made are 'strategic choices'. The decision-making includes both preferences and making of actual choice both of which need to be understood within specific contexts. The study of women students in a government medical college in Delhi has highlighted the need to make a distinction between preferences and choices. The study shows that preferences of participants were broad and open and were relatively less gendered. However, choices were constrained and

influenced by a number of practical concerns. Family, educational institutions, and society at large constrained choices of women and forced some to make gendered choices.

**Key Words: Preference, Choice, Gender, Medicine, Specialisation**

**0528405 GAYAN, GARGI (Surya Kumar Bhuyan School of Social Sciences, Krishna Kanti Handiqui, State University, Guwahati). SCHOOL AND SOCIETY: A STUDY OF A MULTI-ETHNIC GOVERNMENT SCHOOL IN URBAN ASSAM**

The history of human civilization reminds us of the significance of education as a means of socializing the younger generation to cope with its surrounding. With the changing needs and nature of the society the goals and purpose of education has transformed. But there is no disagreeing to the fact that education throughout different ages and in different societies has been one of the central concerns. There have been many debates in history about the nature of education and purpose of knowledge production. The nature of debates changed with the onset of modernity. In the 19<sup>th</sup> century with the upsurge and spread of democratic ideals such as liberty, equality and fraternity, one common goal, to achieve through education has emerged in the popular imagination of most societies. This was a vision of equal rights to access education, that is, ensuring mass education in order to pursue social equality and justice. But with globalisation nations became interdependent to the concept of 'global market' which impacted different aspects of a nation, of which education is one. Accordingly, there is growing belief that education is not just a public good but a site to accumulate private profit.

This work also seeks to map, how with the changing government priorities and policies along with the changing socio-physical landscape of Guwahati city, the character of a school has changed vis-a-vis its relationship with the students it cater to. In this direction one has tried observe the everyday life in the school in the present day as well in its past. But given that the school system operates in an unequal society, one intends to locate the links between school and society. Thus while the school remains central, the study seeks to look into the many ways that the lives of teachers and students in the school are connected to the everyday lives outside the school. Because it is through the daily routines in the everyday lives of individuals as well as social groups, that the social order is created and maintained. The study reveals that there exists a gap between the policy makers, schools/teachers and the guardians of the students. Policies are designed without taking into consideration the ground reality. While directing the schools/teachers to implement a particular policy, there is an urgent need for informed discussions and deliberations between the parties involved. Engagement with the philosophy of many educational policies would help and perhaps inspire teachers to implement them. The failure to do so leads to several well-conceived policies fail at the ground level. On the other hand the present teaching-learning system favors the habitus of the middle class background. Most of the teachers too judge students from the horizon of a middle-class individual. This impacts the learning outcome and thereby aspirations of the children, most of who are first-generation learners.

**Keywords: neoliberal politics, everyday lives, social inequality, habitus**

**0528406 HUN, BHARAT (Department of Humanities & Social Sciences, IIT Delhi, New Delhi-110016). SOCIAL HIERARCHIES AT BORDERLAND: AN ETHNOGRAPHIC ACCOUNT OF KHURI VILLAGE IN THAR DESERT**

Continuity and change in power structure of Indian society is much discussed in social science literature. The transitional phase of Indian state from colonial to post-colonial has brought about change in the power relations and nature of hierarchies through institutional change. However relatively few studies in social anthropology have dealt with the question of hierarchies in borderland in ex-princely states. At the time of independence there were 565 self-governing princely states that existed in Indian subcontinent. This paper is based on an ethnographic study of the *Khuri* village, which was a part of one such self-governing princely state named as Jaisalmer. This paper is an attempt to investigate the effects of the assimilation of princely state Jaisalmer into Indian state. In particular the paper explores that how old social hierarchies survive despite the structural and institutional changes in the nature of state society relations. It explores that how in this affects the lives of borderland people and how Thar people differentiate between princely state of Jaisalmer and the Indian state.



**0528407 JAISWAL, NIHARIKA (.....). SOCIAL SCIENCES IN BANARAS HINDU UNIVERSITY**

This paper rests on an understanding of ‘education’ as a practice embedded in specific historical contexts and carried out within organizational structure of institutions such as universities. The broad question that informs this study is in the neoliberal era, how does one read the equation between the state, the field of higher education, public educational institutions and disciplinary practices? This intersection becomes even more pertinent in the contemporary times. There is an evident policy shift towards public disinvestment in order to build knowledge economies, for a nation to mark its global presence. The idea of education as a ‘public good’ is replaced by an idea of education as a ‘private commodity’. Universities are marketed as ‘brands’ that advocate ‘marketable courses’. This in turn has strengthened the academic hierarchies. The liberal arts are labelled as ‘unproductive’, forcing disciplines under the social sciences to reinvent to ensure their survival. However, one also needs to understand that production and valuation of a certain kind of knowledge as ‘relevant’ and thereby worth producing or learning is also a loaded process. Michael Apple’s understanding of curriculum as not a ‘neutral assemblage of knowledge’ instead as a carefully crafted vision of ‘legitimate knowledge’ produced by the power blocs of the society theoretically guides the observations of the study.

Thus, the objective of this research is to observe the negotiations public universities like the Banaras Hindu University (BHU) are making with the neoliberal paradigm of knowledge production with reference to their social science curriculum. BHU’s development is particularly interesting to read for its history is a witness to the colonial policies of education, the resistance movement and the establishment of a post-independent state. It encapsulates the change in the meaning of ‘nation’, ‘nationalism’, ‘citizenship’ and relevant education with the change in the political authority.

The inferences are based on a critical reading of the post graduate syllabi of history, political science and sociology. In addition, the paper also will analyze the post graduate and PG diploma courses taught in the Malviya Centre for Peace and Research and the Centre for Women Studies respectively. The observations are supported by interviews of the ex-faculty and students as well as the present faculty and students of the above departments. A few details on the method of teaching and mode of assessment is also incorporated in the study for a more holistic understanding.

**Key words: higher education, public universities, social sciences, curriculum.**

**0528408 JAYACHANDRAN, JESNA (Department of Sociology, Guru Nanak Dev University) TERROR COVERAGE: A CRITICAL EXAMINATION OF THE MEDIATIZATIONS OF A TERROR ATTACK IN PUNJAB**

The Dinagar terrorist attack incident in Gurdaspur in 2015 was the first mediatized terror coverage in Punjab since a long time. Its coverage in the national and Punjabi media is an instance that exposes the production of terror news in the contemporary, interactive media environment. Many of the practices discussed in this paper holds true for news production in general. Yet, this paper argues that it is equally important to address the constructions of terror discourse in varying sites- both in the national and regional media. One of the key narratives that frames terror news is of the nation. Though references to border and security discourses abounded in the national and regional media there were rhetorical differences in the broad narrative around the Gurdaspur incident. To understand these mediations around terror, this paper outlines the interconnected transformations in the structures of a heterogenous news landscape driven by commercialization and localization and their relations with news practices which involve technologically savvy audiences across distinct but interconnected sites. It looks at the compulsions and restrictions around the construction of “live” terror coverage. The intensity of production and consumption of such news with its connection to history and politics makes for a “interactive/networked news spectacle”. This the paper makes a comparative observation on the similarities and variations in the emergent terror discourse in the Punjabi and national media.

**0528409 KALITA, MOUREEN (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi-110067). THE CONSUMPTION OF IMAGE: A STUDY OF WEDDING PHOTOGRAPHY IN INDIA**

There is a thick narrative of weddings in contemporary India, inclusive of the star studded Ambani wedding, preceded by the weddings of both film and cricket stars such as Anushka Sharma and Virat Kohli, Priyanka Chopra and Nick Jonas, and so on. The popularity of these events reflects not only the ever-growing craze for celebrity culture but also the concept of 'Big Fat Indian Weddings'. Weddings are considered big news and big business which has infiltrated both reel and real lives. The recent influx of capital in weddings along with globalisation and coming up of the neo-liberal economy, the consumption patterns of contemporary weddings have geared up into new levels. Needless to say, weddings have joined in the large panorama of consumerism with the involvement of various service providers thus making it into one spectacular celebration. Out of the many services provided, this glamorous occasion lends itself a lot to photography, which not only binds together varied memories but is also in itself a corroboration of the loud and colourful Indian wedding. Bringing in the trend of professional photography and video-graphy, this paper grapples with the possibility of delivering an argument on the consumerist conception of weddings in contemporary India. Further it also tries to analyse how wedding photography has changed the way in which the consumerist, as well as the performative aspects of the ceremony, is represented.

**0528410 KHARSYNTIEW, TEIBORLANG T. (School of A International Studies-II, Centre for European Studies, Jawaharlal Nehru University, New Delhi-110067). IDENTITY THROUGH THE LENSES OF INNER LINE PERMIT**

The demand for an Inner Line Permit as an identity issue has been a regular demand in Meghalaya since 1995 when the ILP was withdrawn from the state. Like other states in the Northeast, the demand for action against the influx of 'outsider' that includes legal and illegal immigrants, has been a regular feature in the formation of identity politics in Meghalaya, which began with the anti-Bengali movement of 1979, and the anti-Nepali movement of 1987. The demand for ILP is based on the assumption that the permit will regulate the entry of the 'outsider' (non-state residents) into Meghalaya, which will in turn, protect the state's indigenous tribal population from large-scale influx of illegal immigrants. The influx of illegal immigrants have been a bone of contention in Meghalaya and a recurrent theme in the populist agenda of political and pressure groups in general election, since the formation of the state in 1972. Mostly the student organizations and at times supported regional political parties of the State spearhead the movement against outsider. Prominent among them were the powerful Khasi Student Union (KSU), Federation of Khasi Jaiñtia and Garo People (FKJGP), Hynñiewtrep National Youth Front (HNYF), Ri-Bhoi Youth Front (RBYF), Garo Student Union (GSU), All India Garo Union (AIGU), Federation for A'Chik Freedom (FAF), A'chik Youth Welfare Organisation (AYWO), Jaintia Student Union (JSU), Civil Society Women's Organization (CSWO), Khasi Women Welfare and Development Association (KWADDA), Jaintia Youth Federation (JYF), All Jaintia Youth Welfare Organisation (AJYWO) and Association of Democracy and Empowerment (ADE). Like the earlier period of agitation against outsider, the protest for ILP in 2012 was marked with frequent bandhs, strikes, incidents of arson and death. Today, while the ILP stands withdrawn from the state, yet student bodies have not abandoned the demand for its return. With the current debate on National Register of Citizens (NRC) and Citizenship Amendment Bill (CAB), the demand for an ILP is once again gathering pace. The response of the government of Meghalaya to the demand for the ILP is not its reintroduction but the proposed amendment to the Meghalaya Residents, Safety and Security Act, 2016 (MRSSA). The proposed amendment is when passed will require people from outside to register before entering Meghalaya-thus similar to the Inner Line Permit. It is in the context of the movement for ILP that this presentation will trace the discourse of indigenous identity in the state of Meghalaya. The presentation will attempt to argue that the demand for the ILP and similar legislation, such as the NRC can be seen as a demand for protection of indigenous identity but such demand can also be linked to the larger framework of new developments in the northeast region and the framing the 'insider-outsider' discourse through the NRC and CAB.

**0528411 KHUNTIA, DEVANJAN (Sociology, School of Humanities & Social Sciences, G D Goenka University, Gurgaon-Sohna Road, Haryana). NEWS BROADCASTING AND DEMOCRACY AS AN EVERYDAY PRACTICE IN CONTEMPORARY INDIA**

Democracy is achieved with everyday practice collectively by the state, social institutions, and most importantly the people. Democratic practices are the ways these stakeholders can work together even when they disagree to address shared problems. This process of liaisoning between social institutions and social actors is what constitutes politics which in turn decides the degree of democracy a state expedite. In a modern democratic society, politics is primarily practiced in ways so that the ordinary citizens have accesses to routine social actions. Practicing democracy also involves ordinary citizens identifying barriers to accessing routine social actions which are collective problems and subsequently identifying collective solutions. This process of identifying collective problems and collective solutions generate a collective view of the people which is known as public opinion. While identifying collective social problems, individuals adjust their ideological positions, coinciding with prevalent public opinion to ensure maximum access to routine social actions. However this process of identifying collective problems and collective solutions is a continuous development, in which the public opinion undergoes continuous change and with change in collective perception towards what is important to 'them'. This empirical research paper, which is part of my doctoral research, looks at the role of 24x7 News Channels as social institution that constitute the aggregator of people as 'them'. Subsequently this paper also discusses the various processes through which news media 'constructs' collective social problems and solutions which are assumed as a true representation of collective social view or public opinion. However within this mediatized framing structures of social reality the 'naming' of the problem and 'proposing' solutions may seem an outcome of public deliberations but in reality they have been compromised thus challenging the concept of democracy that is being practiced.

**0528412 KONSAM, REKHA (.....). GENDERED SPACES OF PERFORMANCE**

The Raseshori Pala holds the distinction of being the first women's devotional performance group in Manipuri Vaishnavism, the Jalakeli Pala being the second one. They are the harbingers of women's participation in the world of Meitei Hindu devotional performance at the heart of which lies the Nat Sankirtana. They are considered to have paved the path for women's participation in these arenas. It is not surprising that members of the two groups were not commoners but women born within a certain group. It was only with the coming up of the nupi pala who were professional singers that the devotional singing became accessible to women as such. Interestingly, until the instituting of the Raseshori Pala under the patronage of the King, Maharaj Bhagyachandra in the 18th century, women were denied the privilege of offering the Nat Sankirtana as a devotional performance. The very fact that it came to be instituted gains significance in the face of the opposing ideals and customs as also of the governing religious bodies of the time. The paper proposes to address some of the intrigues that has defined and shaped the very participation of women in a specific defined and delimited space and continues to do so. This space is one that intersects religion, politics, culture, performance, kinship, power, gender and the state. With the enlisting of the Nat Sankirtana in the UNESCO intangible heritage list, the artistic devotional performance has garnered more attention but what implications does this move have vis-à-vis women's participation in the said field? Has it given impetus or has it remained overshadowed as it has traditionally tended to be?

**0528413 KUMAR, VINOD (Department of Sociology, Punjab University, Chandigarh). THE POLITICS OF POLLUTION AND STUBBLE BURNING IN PUNJAB**

Climate change and global warming is becoming every household topic. Even the people in villages are talking about shifting of winter and summer months for the crops. But there is a big politics on national and international level on the issue of climate change. The farmers of Punjab and Haryana are facing lots of blame from Delhi people, government and urban population of different cities. But nobody wants to understand the plight of the farmers. They want to impose all the blame without understanding the root cause. Because farmers are sitting at the edge. It's extremely easy to blame the powerless by the powerful. By burning the stables farmers are protesting and trying to make sense of the plate they are facing, to determine population, and specially to the government.

There are few important issues to understand. There is a policy by Haryana and Punjab government to delay the paddy sowing for one month, therefore farmers will be burning the stubbles one month later, in October and November, when winter starts, flow of the air is minimum, and air become stable. So pollution would not move, because of little rain stubble burning become difficult and produce more smog. This policy was made to save the groundwater but now it is polluting the air. The farmers are not getting minimum support price for other crops therefore they are not going to sit on any other crops. Swaminathan Aayog report was not implemented, therefore farmers are not getting enough income to handle rice stubble. Because they are delaying the paddy sowing for 1 month, therefore there in hurry for the next wheat crops. In order to clean the farm immediately there burning it. Then the politics of stubble burning and pollution starts. Now supreme court also emerging in the picture. And farmers are also doing it to make themselves heard by politician. The farmer organisation are also playing important role in the stubble burning.

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**0528414 MAJUMDAR, PRATICHI (Centre for the Study of Social Systems, Jawaharlal Nehru University, New Delhi-110067). STORY 'TELLERS' AND 'LISTENERS': THE INTERNET AND CHANGING DYNAMICS**

This paper is an attempt to understand the different forms of audience-audience and audience-creator interactions on the internet. Given the immediacy and proximity provided by the internet, it becomes easier for users all across the world to view and react to the stories put out online, discussing and debating with each other and the creators in real-time. With Web 2.0, the internet is no longer an as platform where a single user creates and publishes content, but as a space where content can be created and modified by all users and participants in collaborative manner. Social media sites, blogs, and vlogs, live broadcast, fanfiction websites, all make the distinction between the 'expert' and 'lay person' increasingly blurred.

The paper looks at the relationship between the story 'tellers' and 'listeners' – the power dynamics, who has the control over decision making regarding what, how and when to relay, and what are the available forms reaction to such decisions. It also tries to analyse the relationship between different groups of listeners – who is consuming what stories, what are the available modes of reacting, and how do they make use of these, if they do. Using a cyber-ethnographic study of different webseries and other story forms on the internet, and comments put out on the internet, the paper attempts to make sense of how changing technology might impact such relations.

**Key Words: Storytelling, Web 2.0, audience, creators, interaction**

**0528415 MISHRA, SHALINI (Department of Sociology, T. D. P. G. College, Jaunpur). CONTRIBUTION OF SCIENCE TO RESOLUTION OF CONFLICT AND VIOLENCE**

One of many causes of conflict is the inequitable distribution of resources which is accompanied by widespread poverty. The absence of culture of peace and the presence of conflict and violence oriented communication also make the strugglefull society. This article has highlighted the causes of the violence, social conflict, the need of peace and the scientific strategies to avoid the conflict and violence from the society. It indicates that there are much more peace building actions that needs input of advance technology and science.

The three main pillars, scientific knowledge, process used in acquiring scientific knowledge and the application of the knowledge can influence the poverty reduction, socio-economic development, dialogues and communication communities and the mind set that avoids the conflict and violence as well as promote the peace in society.

**0528416 MOHANTY, RAHUL (Department of Sociology, Utkal University, Bhubaneswar). REVIEW OF SURRENDER CUM REHABILITATION POLICY FOR NAXALS: PROSPECTS AND CHALLENGES**

Maoists have a long tryst with development. Paradoxically Maoists have started their struggle to bring the development to the long neglected hinterlands. But now they are viewed as the biggest obstacle for the process of development due to the cycle of violence and counter violence initiated by them. In the beginning government viewed it as a mere law and order problem. Repressive State Apparatus like state police and central forces have been deployed to deal with this menace and an unending asymmetric war has begun. Though it failed to annihilate the naxalite problem but it trapped the tribal subalterns between security forces and the naxal cadres. Then government added developmental perspective into the picture. Various infrastructural projects like road connectivity carried on in the region. Human development projects related to skill, education and health initiatives also launched in the region. Among all these policies, *Surrender cum Rehabilitation Policy for left Wing Extremist* is noteworthy. As the name suggests this policy was meant to bring the Naxal cadres back to the mainstream. The success of this policy will not only control the naxal violence but also rehabilitate the surrendered naxalites in a meaningful way. Rehabilitation of a single naxal will create a snowballed impact on other naxals which at the end will tackle the problem at large. Here in this research Paper, we will discuss various aspects of policy guideline issued by Centre and State Surrender cum Rehabilitation Policy of Odisha government. We will again shed light on the success and lacunae in the policy from the view point of tackling naxalite menace. Additional measures to improve this policy will also be suggested by the researcher from his field work experience.

**Key words-** Naxalites, Maoists, Rehabilitation, Left wing Extremists, Specialised Forces, infrastructure projects, counter violence

**0528417 MOHANTY, TANAYA (Department of Sociology, Utkal University, Bhubaneswar). STATUS OF RURAL UNIVERSITY IN INDIA: A HISTORICAL PERSPECTIVE**

This paper aims at exploring the idea of rural universities and its scope as presented in major education commission reports that appeared at key historical junctures. The first education commission to be set up after India attained independence was the University Education Commission Report, 1948. This commission was convened under the chairpersonship of Dr. Sarvepalli Radhakrishnan who went on to become the second president of India. So, it was popularly known as the Radhakrishnan Commission. This particular report devoted one chapter to rural universities, and a separate plan of action to form the basis for a differential education system based on Gandhian values of discipline and manual labour on the rural spaces. Though in the subsequent reports, one could witness that the usage of the concept got thinner but moreover, the spirit remained consistent through different reports from 1948 till the draft national education policy, 2019 of the present times. For the purpose of the paper, I have used two methods. First, I have tried to locate each text in its context in an attempt to do a discourse analysis, and second, the paper is based on my location as a woman teacher in one of the rural universities in Odisha. My eight years' experience goes into the making of a participant observer in a rural university set-up. This paper aims at bringing out

the differential form of education in terms of curriculum and pedagogic practice as a part of nation building process in rural universities.

**Key words:** Rural University, National Education Policy, differential education

**0528418 MOHAPATRA, BISHNUPRASAD (Department of Sociology, Utkal University, Bhubaneswar). STRUCTURAL TRANSFORMATION AND CORPORATE INTERVENTION: A HISTORICAL PERSPECTIVE ON SOCIAL RESPONSIBILITY**

The culture of social responsibility behaviour of corporate in India has a long history. Recently, it is prominently named as Corporate Social Responsibility (CSR) and considered as post globalisation phenomena for corporate in India. Though CSR engagement by corporate recently has accelerated, but the culture itself is implicitly rooted in religious and traditional values, morality, customs, and ideal system of charismatic leaders. This renewed role of corporate is considered as an organizational responsibility towards an equitable development of society. Looking into the current relevance of the new governance system, the present paper has explained and analyzed the history of structural transformation in the culture of social responsibility. The paper reveals how this structural transformation has grown from the traditional family value of 'Charity' to the practices of 'Venture Philanthropy' within the modern governance systems of corporate in India. This structural development can be discussed in five stages over a period of time. These stages marked the transformation of culture through the nature and extent of involvement, types of corporate, forces and motives, and dominating ideas in different periods. In this structural matrix the paper has analyzed the importance of CSR in bringing equality and justice in the society, and discussed what can be the alternative CSR framework for India.

**Key Words:** Social Responsibility, Charity, Philanthropy, Historical Perspective, Corporate, India

**0528419 MUKHERJEE, KAMALINI (Department of Sociology, The Bhawanipur Education Society College, Kolkata). CAN THE SUBALTERN BE HEARD? EXPLORING DISSENT IN ALTERNATIVE SEXUALITIES**

The paper engages with the postcolonial discourses of exclusion and dissent arising from the "queer" community in India, by adhering to the theoretical developments in subaltern studies on the politics of the marginalised. Moving beyond Foucault's perspective of sexuality and gender, it delves into the very nature of the rigid socio-cultural structures in India, and the protest methods of the marginalised groups in destabilizing the structures. The paper delineates the significant disagreements of the Indian "queer" with the country's system of mainstreaming heteronormativity: where "queer" subjectivity is structured through subaltern experience. The proclivity to dissent against the mainstream sexual and gendered identity arises from two distinct sections - civil society and academia, other than the larger queer community itself. The first section maps the intellectual positions on the sexual subaltern and leads to exploring the "silent opposition" drawing on the major movements and protests by the "queer" community in India. The paper presents a picture of who the "queer" is in India, and if their objections can be *heard*, by engaging with the leading subaltern scholar Spivak's question: can the subaltern *speak*? The findings establish a link between the experience and the expression of the subaltern, by locating the dissent within the queer 'body' and the politics of sexuality outside of it. The research draws from the familiar strains of dissent that is present in the intellectual and academic dialogue in India.

**Keywords:** subalternity, alternative sexuality, dissent, marginality, identity

**0528420 NAGARAJAN, ARAVINDHAN (APU, Bengaluru). A PRODUCTION-BASED FRAMEWORK TO STUDY THE INFORMAL WASTE RECOVERY AND RECYCLING SECTOR**

The informal waste recovery and recycling sector (IWR) has been recognised as a significant contributor to informal employment in the developing world. In comparison to the unorganised sector in general, IWR is characterised by even lower scales of production, extreme disaggregation of production processes, and work precariousness. Correspondingly, existing literature on IWR is also disaggregated, relying largely on anecdotal

evidence and case study approaches. While highlighting important concerns of marginalisation and occupational hazards faced by workers, these approaches have been restricted in terms of the nature (absence of production processes) and scope (an exclusive focus on waste picking) of explanations they offer. This restrictive approach stems also from the failure of field-based studies in IWR to incorporate methodological advances made in the study, measurement, and analysis of the unorganised sector in general. This paper will contribute to this discussion, by highlighting a production-based framework (a methodological basis) for field studies of IWR. Secondly, it will present results of a field study (of plastic recycling units in Mumbai) conducted by the author, to emphasise how such a framework can better address factors such as material flows, industrial organisation, firm level characteristics, and patterns of wage and employment.

**0528421 NAIK, SHATHI (Department of Sociology, Women's Christian College, Kolkata). FIGHTING SOCIAL MARGINALITY: A STUDY ON THE TRANSGENDER COMMUNITY**

Transgender is an umbrella term used to describe people whose gender identity or gender expression differs from that usually associated with their birth sex. The widespread nature of discrimination based on gender identity and gender expression has increased the marginalization of the transgender people. In the Indian society, the transgender has always been looked down upon and have faced stigma, discrimination, lack of social support and inadequate access to care from the members of the society. While transgenders have received support from peers, family and helping professionals who act as protective factors, they have also faced rejection and have been denied their status and position in the society. In this light the current paper focuses on the following objectives: (a) to determine the extent of social marginality that is experienced by the transgender community; (b) to examine the difficulties that they face due to this marginalization; (c) to understand the various ways that transgenders adopt to fight social marginality. To fulfil the purpose of this research study both primary and secondary data has been used. To gather primary data from the field, interview and case study method have been used. Through these methods, the paper aims to provide insightful data on who are the transgender community and the difficulties that they face in their life course. The paper looks into the various degrees of differences and unacceptability that the transgender community faces over time. Thus, the present paper outlines the nature of social marginality that the transgender community faces, how it creates barriers and aggravates their problem, the measures that they undertake to fight marginality such that it ensures the transgender their rightful position in the predominantly hetero-normative society.

**Keywords: discrimination, identity, gender, marginality, stigma, transgender**

**0528422 NAIR, GAYATRI (IIIT, New Delhi). ORGANISING THE PRECARIAT; ARE THE PRECARIAT A CLASS?**

New forms of work that have emerged under advanced capitalism, built around zero hour contracts and an absence of security, have been termed as creating a new class of workers-the Precariat (Standing, 2008). This paper will explore the notion of precarity across the terrains of informal and gig work and unpaid and paid work. It will unpack the shifts in how precarity develops to highlight both the macro changes that have propelled such a system and the everyday ways through which precarious workers (rendered additionally vulnerable by caste and gender) negotiate with this precarity. The paper will examine how precarity in work and the shifts in its nature have shaped a history of collective action and the potential and shape of future collectives of workers. Given the rise of new gig worker collectives and older unions struggling to respond this context, this paper will also explore whether the broader Precariat are a class and whether precarious workers view themselves as a class in and for themselves.

**0528423 PADMAVATHI, P (Department of Sociology, Bangalore Central University, Bangalore). THE IDEA OF DEMOCRACY IN INDIA: B.R. AMBEDKAR'S STRUGGLE AND VISION**

India as a democratic political system is witnessing new developments with respect to nationalism, development and democracy. These developments should be examined with the support of various philosophical efforts that were made in the realm of modern Indian socio-political thought. This paper makes an attempt to deal with the alternative ideas and struggles as imagined and waged by Ambedkar in India's struggle against colonialism. The other question raised in this paper is whether Swatantra Bharat's (Independent India) polity and society

seriously made efforts to include Bahishkrut Bharat (Untouchable India or excluded India) to make Swatantra Bharat a Prabuddha Bharat (Enlightened India).

**0528424 PATAR, MAITRAYEE (Department of Sociology, Tezpur Central University). SHIFTS AND CONTINUITIES IN CONTEMPORARY RELIGION: NOTES FROM A PERIPHERAL COMMUNITY**

The secularization theory is seen to have experienced the most sustained challenge in its long history, as religion is still as present in society as it ever was, and perhaps more. Peter L. Berger, one of the foremost advocates of secularization during the 1960s, recanted his earlier claims- "The world today, with some exceptions...is as furiously religious as it ever was, and in some places more so than ever. This means that a whole body of literature by historians and social scientists loosely labeled 'secularization theory' is essentially mistaken". Carrying forward the critical perspective on secularisation theory and extending it to peripheral societies, this paper would examine empirical data from the field to arrive at a general understanding of the ways in which peripheral societies such as Tiwas are responding to the recent ideological shifts in the perception of religion, secularism, and politics in mainland India.

In the context of South Asia in general and North East India in particular, politics around religion has brought in dramatic shifts among peripheral communities viz-a-viz their religious and cultural practices. For the Tiwa Tribe in Assam, religion is known to be intimately interwoven with their way of life, in ways that it also forms significant aspects of their culture. This paper would look at the existing hints towards a possible structural shift of the Tiwa community with regard to religion. Where does one situate the idea of secularism put forward by the Indian nation in the times of these paradigm shifts? How does the peripheral gender navigate through these shifts, especially in a community with a long history of religious conversion, kinship anomalies, and language paradoxes?

Thus, this paper would attempt to use religion as a methodological tool to understand the changes that the Tiwa community is going through. To call these shifts a subtle form of religious imperialism that is working towards a religiously homogenous nation would be too simplistic a derivation. Further, the politico-economic calculations centring religion that the members of the community carry out with respect to their daily lives also have to be considered while arriving at a more empirical understanding of how religion work in peripheral societies of contemporary time.

**Keywords: Religion, Periphery, Tribe, Gender, Social transformation, Secularism**

**0528425 PATGIRI, RITUPARNA (Department of Sociology, Indraprastha College for Women, University of Delhi, New Delhi). NEGOTIATIONS AND ASSERTIONS: EXPLORING THE INTERCONNECTIONS BETWEEN FOOD AND IDENTITY AMONGST THE INDIAN DIASPORA**

The emergence of the nation-state as a political entity is considered to be a defining moment in the history of the world as it has helped in creating closed boundaries. The nation as an entity is exclusive in its scope as there are people who belong to it and there are others who do not. As Benedict Anderson would argue, a nation is an 'imagined political community', imagined as both inherently limited and sovereign. The nation is imagined as limited because even the largest of them has finite boundaries, beyond which lie other nations (Anderson 1983). However, the phenomenon of migration, especially transnational migration is the biggest challenge that nation-states face in terms of managing borders, identities, cultures and maintaining exclusivity. What transnational migration does is create new conditions in both the sending as well as the receiving country, changing identities and cultures. In this paper, I am going to look at the role that food plays in maintaining national and ethnic identity in the host nation for Indian diasporic populations. Food becomes an instrument for them to display their ethnic and national identities and engage in a kind of 'gastro-nostalgia' (Srinivas, 2006; Saunders, 2007). For instance, for many Hindus residing abroad, a vegetarian diet becomes a primary tool for distinguishing themselves from others. In a largely non-vegetarian world, by non-consumption of meat these people create distinctions between the 'self' and the 'other'. It becomes a way to proclaim that they have not lost their 'Indianness' and Indian identity in spite of



living abroad. Identity is not an accomplished fact, but a 'production' which is never complete and always in process (Hall, 1994: 222). Food consumption is seen as a 'narrative of affiliative desire' that affectively recreates caste, micro-regional and other social identity groupings for the cosmopolitan Indian family (Srinivas, 2006: 193). The essential purpose of this paper then is to look at the role that food plays in asserting and maintaining identities in a globalized and cosmopolitan world. While transnational migration means that people are living outside their countries of origin, food becomes a way to maintain their connections with their native land. Using a historical method of study and interrogating existing literature, narratives, documentaries and movies, this paper attempts to unravel the linkages between migration, food, and globalization.

**0528426 PATGIRI, RITUPARNA (Department of Sociology, Indraprastha College for Women, University of Delhi, New Delhi). POPULAR CULTURE AND STRUGGLE FOR RECOGNITION: MOBILE THEATRE OF ASSAM**

The phrase popular culture is used to denote the culture of the people, the masses. Many theorists understand 'popular culture' as 'mass culture'. Popular cultural forms of music, dance and films are seen as 'products of crass commercialisation.' In fact, the phrase popular culture is used in opposition to the cultures that are considered 'high culture' and 'elite culture'. There is an implied 'otherness' in the use of the phrase popular culture itself.

Therefore, forms of popular culture are not recognized as 'cultural forms' or pure 'art forms.' The objective of this paper is to shed light on this existing debate on the meanings of culture through a study of a particular theatrical form – mobile theatre of Assam.

Mobile theatre groups of Assam, popularly known as *bhyrmoman* natak, consist of actors, singers, dancers, directors, action artists, makeup artists, workers, and the producer. These groups move from place to place within the state – covering both rural and urban areas. The total team members of a troop can range from anywhere in between 100-150. These theatre groups are invited by organizations and institutions like colleges and schools who loan their field to the group for three days for their performance. The groups stage new play productions every year - averaging 50-200 shows per year. Mobile theatre has become increasingly visible in Assam. In fact, it has emerged as the most popular form of entertainment in the state eclipsing the Assamese film industry. Almost 133 mobile theatre groups have existed in Assam at various points of time since the first one was established in the 1930s. In the present time, nearly 60 theatre groups perform their plays all over the state.

However, in spite of its popularity, mobile theatre is facing a struggle for recognition as an 'art form'. The public that watches this form of theatre is heterogeneous – it comprises the poor, the working class and women. This is because of reasonable ticket prices and content of the plays. The plays are 'entertaining' in nature, very similar to commercial Hindi films, with a mix of action, romance, and songs and are performed in Assamese. The rural public, thus, connects to mobile theatre and has kept this theatrical medium alive and flourishing. The urban elite, on the other hand, does not consider mobile theatre as 'real theatre' and accuses the producers of providing 'cheap entertainment' to the masses.

Popular culture, including mobile theatre of Assam, challenges the dominant cultural perspective and in the process shows that culture is not a homogeneous entity and there are multiple meanings associated with it.

**0528427 PUJAR, VENKATESH (Department of Sociology, Bangalore Central University, Bangalore). RURAL HEALTH CARE FACILITIES A, SOCIOLOGICAL STUDY**

The present article aim to study the outlook and contentment of the various healthcare facilities provided in the rural area of Gadag District, Karnataka. The research work will under taking by using the primary Data, Field survey, Government records and Secondary sources. Which includes an analysis of the progress in health care institutions, availability of healthcare facilities, the status, health manpower and the quality of healthcare services and Major Diseases in the Rural Areas of Gadag? The healthcare infrastructure consists of basic physical and human

resources apart from equipment and medicines. Hence a comprehensive analysis of health care infrastructure should include hospitals, dispensaries, practitioners, doctors, paramedical staff, other health workers, number of beds and pharmacy stores. Improvement in the health status of population is a major thrust area under the social development programs being undertaken in the country. This is sought to be achieved through improvement in the access to and utilization of health services in the country with special focus on under privileged segments of the population. India has built up a vast health infrastructure; however there is variation in extent of access to and utilization of healthcare services among states, districts and different segments of society.

**Keywords - Rural Healthcare Facilities a Sociological Study**

**0528428 RAM, REENU (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi110067). NEGOTIATING MASCULINITIES: A CASE OF MALES SEX-WORKERS IN MUMBAI**

Sex work in India is generally equated with female sex workers and people mostly believe that this is the only reality. This paper takes institutionalized compulsory heterosexuality as the starting point and locates men who sell sex to men in this cultural milieu. Though male sex workers are male (outer social reality) their work is to cater to male clients and act as female if client demands in a same-sex sexual encounter. This situation means that the life-course of male sex workers is characterized by dialectic of transgression and conformity resulting from conflict derived from both masculine and feminine self-representations. This whole imitation involves a medley of identity forms. One is an enchantress, seductress who is ready to play any role to satisfy her/his client. This enchantress then switch role to play a devoted son, a doting father and a husband with family. This paper will attempt to understand how sexuality is culturally produced in multiple ways and how male sex workers negotiate these culturally determined sexual scripts. This negotiation is marked by constant tension to behave in a culturally appropriate manner. Thus one aims to understand how male sex workers contest, reproduce and modify masculinity in their everyday interaction with clients, partners, wives and significant other.

**0528429 SAHA, PRADIPTA (IDSK, University of Calcutta, Kolkata). REFORMING PRISONS OF WEST-BENGAL: REFLECTION OF COMPLICATED EVERYDAY LIVES IN ALIPORE WOMEN'S CORRECTIONAL HOME**

This paper aims to understand the historical background of prison reforms before critically engaging with the West- Bengal Correctional Services Bill, 1992. Jails in West-Bengal were renamed as correctional homes. What did 'correction' signify and how the bill reproduced gender stereotypes. Moreover, the bureaucratic interpretations of this Bill/ Act have been explored.

The paper also provides a sense of how women live in jails, what do they do there, how are their lives regulated by prison norms, how do they perceive prisons and the entire liberal discourse of "correction".

**Keywords: reform, everyday-life, surveillance, prison systems, hierarchy**

**0528430 SAHOO, SUMITRA (Department of Sociology, Utkal University, Bhubaneswar). CIVIL SOCIETY AND TRIBAL DEVELOPMENT: A STUDY OF NIYAMGIRI RESISTANCE**

Civil Society is considered as the 'third sector' which is distinct and alternative to state and market form of development. Its development and growth rose with the struggle and protest against post-Washington consensus worldwide. The struggle and protest of civil society also marked in different tribal habitats of the world. The protest of civil society in tribal areas triggered with support from the native peoples – who wants to protect their land, forest, natural resources and culture from the market and state power. In the above background, present paper analyse the role of civil society in the Niyamgiri resistance and for the development of Niyamagiri Habitat – Dongoria Kandha. Niyamgiri considered as rich in forest, mineral and material resources with strong nature-culture relationship by the local habitats. The Niyamagiri considered as the way of life and livelihood for the local habitats. Its mineral and material rich geography attracted state and Vedant for resource extraction by devastating the long-

standing nature-culture relationship of local habitats. The active involvement of Civil Society in Niyamgiri, not only help the indigenous tribal group to organise the protest, but also create the social consciousness and network to protect the forest and resources in their land. This production of public sphere in Niyamgiri is result of the activities of civil societies. The paper reveals how the 'public sphere' crated by civil society and native people through the method of continues dialogue, debate, and participation.

**Key Words: Tribal Development, Niyamgiri, Civil Society, NGO's, Resistance, Odisha**

**0528431 SALMAN, AASHTI (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi-110067). REASONS FOR SECONDARY SCHOOL DROPOUT AMONG LOW-INCOME MUSLIM MEN IN JAMIA NAGAR, DELHI**

This paper aims at understanding the reasons and experiences which contribute to dropout among Muslims in India at the secondary school level (grades IX-XII). The locus of the paper is low-income Muslim men, who have left school at the secondary level, in a predominantly Muslim neighbourhood of Jamia Nagar, Delhi. The context of this paper is set by the seminal Sachar Committee Report which highlights the educational disadvantages of Muslims, categorizing their school dropout as 'worrysome'. The findings of this paper are partially consistent with previous research. In the final instance, Muslim men in Jamia Nagar linked their school-leaving to their personal failure: in terms of their inability to maintain interest in studies/failing to clear a grade. There was a strong value attached to hard work which men felt they lacked, and this was cited as the reason for their personal failure in school. In the process of constructing this narrative, family experiences were downplayed. School experiences were singled out by men as not affecting their decision to drop-out. Another striking finding of this study is the relationship between self-employment and decision to drop-out.

**0528432 SANCHI, SAVYA (Department of Sociology, University of Allahabad, Allahabad). IMPACT OF 'BRAIN-DRAIN' ON GROWTH OF INDIGENOUS SCIENCE AND TECHNOLOGY**

Brain drain can be understood as the migration of skilled human resources in search of high standard of life quality, employment, hefty package, and access to advance technology and science. In most of the cases it has been seen that developed countries like (America, Russia, Japan, China) attract the talent from less developed areas. The majority of migration occur from developing to developed countries. The migration of professionals, both within countries and across international borders is a growing concern world wide that directly impacts the growth of indigenous science and technology. The country invests in the education, science and technological growth of young professionals, but it converts and directly impact the growth of country when these people (resources) migrate and direct benefit accruing to recipient states who have not worked out the cost of educating them.

Why do brain-drain occurs? What are the consequences of such migrations especially in science and technology sectors? What policies can be made to stop these migrations from developing countries to developed countries? This article will provide the solution and identify the main issue which would enable immigrant people to provide their skill to share their technological and scientific knowledge and innovative capacities and thereby enhancing the growth of indigenous science and technology in their own country.

**0528433 SARAVANAN (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi-110067). CIVIL SERVICE DREAMS: A SOCIOLOGICAL INVESTIGATION OF YOUTH ASPIRATIONS**

This paper examines the aspirations of graduate youngsters, an understudied yet relevant topic of concern for the current educational and employment related discourses in India. Union Public Service Commission conducts Civil Service Examination for the aspiring candidates in the country. These posts are not only coveted but require hard work and perseverance. While the exam is considered one of the most competitive in the world, there have been clusters of coaching centers sprawling in the country like never before. Aspirations breed business and create a market around them. This study was conducted to understand two such sites, viz., Rajendra Place and Mukherjee Nagar in Delhi. The former is popular among the English-speaking candidates whereas the latter is occupied by the

Hindi-speaking ones. The study is intended to ascertain what constitutes individual aspirations, their social and economic determinants and how they operate out in the field. It also aims to gather what kind of problems they face, how do they manage their schedule and other significant aspects that defines and reinforce their ambitious lives. Apart from being a study of youngsters and their aspirations, this is a sociological investigation into institutions such as family, education and bureaucracy that affect them. Both the above-mentioned sites have the features of an industrial cluster. Moreover, the environment and the individuals reinstate each other. This paper brings out the dynamics of competitive exams as sites of aspirations, how the life of training and preparation are organized around its spatial features. Besides participant observation and survey questionnaire, in-depth interviews were also conducted for the study. The research was guided by sources such as the news archives, government documents and institute pamphlets.

**0528434 SAVITHA, B C (Department of Sociology, Bengaluru Central University, Bengaluru). COMMUNITY PARTICIPATION IN SCHOOL EDUCATION: ISSUES AND CHALLENGES**

This paper attempts to critically explain various issues faced by other backward class in order to participate in various school activities, how caste is playing major role in decision-making and its impact on school development. This study was conducted in Bangalore Rural District.

This paper is qualitative and exploratory in nature and proposes to use data from both primary and secondary sources. Primary data has collected by using questionnaires and focused group discussions with selected groups of parents and community representatives. An exhaustive list of questions has formulated to collect data from various concerned participants.

**Key words: Community Participation, rural education school development and other backward classes.**

**0528435 SEN, HIA (Department of Sociology, Presidency University, Kolkata). WHAT THE WORKING CLASS CHILD DOES TO THE WORKING CLASS**

The proposed paper is an attempt to understand how the sociology of childhood can benefit from the introduction of the categories of class and leisure practices, and is based on preliminary fieldwork on children of working class parents in Kolkata. The place of class in childhood studies is a troubling one, as it at once provides the kind of diverse contexts for the ethnography of children's lives that was espoused by the new Childhood Studies from the 1990s, but also threatens to produce a deterministic understanding of childhood which the agency-centric subdiscipline is wary of. By exploring children's accounts of leisure practices and by problematizing the question of the children's tastes, against their location in an urban space, this paper will look at the relationship between childhood and class, and if children's practices can be seen to maintain or produce class. Instead of the predominant practice of understanding childhood from a classed perspective by exploring parental values, this paper proposes a childhood perspective of class.

**Keywords: Childhood, agency, working class, leisure, parenting, consumption**

**0528436 SEN, SREYA (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi-110067). 'CASTE OF OUR NEIGHBOURS': UNDERSTANDING MIDDLE CLASS ATTITUDES TOWARDS PROPERTY IN KOLKATA**

Scholars assert that urban property in South Asian cities not only establish a political or economic relation between persons but a social relation as well. A common interest in property ownership and property-driven economy, across both old and new middle class, is now observable here. This paper attempts to frame debates on the importance of caste question in housing by focusing on everyday negotiations and interactions between middle class as they aspire and contest for ensuring a particular 'global' lifestyle for themselves in the city of Kolkata, located in the eastern side of India. In the course of my research it was observed that while earlier neighbourhoods were coded strictly along caste lines, in the contemporary period it will be inappropriate to consider that caste has completely vanished from urban spaces. Through processes of change and continuity, caste functions as a persistent component

determining the residential patterns and also levels of interaction between neighbours in the city. Therefore building from a review of the literature and ethnographic fieldwork in Kolkata, the paper juxtaposes changing relations to property ownership with changing negotiations between communities. Here I consider the matrix of urban property networks in order to trace urban experiences along the expanding boundaries of Kolkata.

**0528437 SHARMA, CHHAVI (Department of Arts, Manipal University Jaipur). MIGRATION, (IN) VISIBILITY IN A GLOBAL CITY: A CASE OF MUMBAI'S ICONIC TAXI DRIVERS**

Taxis and taxi drivers are synonymous to the city of Mumbai, still called fondly Bombay by many of its residents. Taxi trade and its migrant drivers have been part of many portrayals of the city: in writing, in print, in films and thus, any imagination of this aspirational city is incomplete without these two figures. Taxi drivers carry with them the history- of their native place, their journey, the city, its changes- infrastructural, political and even ideological. They have witnessed and experienced transformations in their position in the city as also the dynamicity of how they get to be perceived- as “charismatic urban experts” to a personification of old, rustic and out-dated to the advancing city, a global city.

Drawing from interviews spanning three years with the older to the younger generation of taximen and supported by archival research the paper shall detail out how with the changing city: its growing middle-class, robust voices of “globe class”, predominance of financial networks, importance of being a node in the networked world have further altered the landscape for the century old taxi trade and its taximen, who call Mumbai their “*karmabhoomi*”. The paper indeed asks: can these urban experts of Mumbai rightfully claim their right to the city given they feel a continued sense of belonging to the city.

**0528438 SHARMA, ARNAV DAS (Department of Sociology, Delhi School of Economics, University of Delhi, New Delhi-110007). RAVIDASSIA: CULTURAL HYBRIDITY, RELIGIOUS PRACTICE AND COMMUNITY**

This contribution draws from the growing tide of scholarship centring on new religious movements by focusing on the ‘Ravidassia’ – a community of believers in north India, named after the medieval mystic poet Ravidas, and it comprises primarily of the lower-castes. Based on extensive ethnographic fieldwork in Varanasi, which happens to be the main pilgrimage centre of the community, this paper seeks to understand the complexities of religious definition and self-identity, especially among the lower castes and in a city which commands a strong presence in the Hindu imagination.

This contribution reflects on the blurred boundaries between anthropological terminologies such as ‘sect’ and ‘religion,’ and does so by first describing the relationship between the members of the Ravidassia community and the organisation of the community’s sacred space.

This distinction between terms such as ‘religion’, ‘sect’, and ‘cult’ *et al.* unsettles preconceived ideas of a monolithic religion, like Hinduism and Sikhism. Borrowing from the idea of ‘cosmopolitan canopy’ (Anderson: 2012), as both topographic as well as a linguistic space of liminality, this paper would unpack how the terminologies of belonging are employed, and the ‘slippages’ occurring between them. A substantial part of the paper will also focus on this idea of linguistic liminality, where the terms employed by the informants about themselves, their community, their religion, will be analysed to understand and mark the forms of religious slippages, or crossing. In the latter part of the paper, the argument segues into a discussion of the overriding connection that the State has with identities, and the complexities of various juridical practices in identity formation.

**0528439 SHARMA, VIKAS (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi-110067). FORMATIONS OF NEW ELITE NETWORKS: AN EMPIRICAL ENQUIRY INTO THE PANCHAYATELECTIONS OF JAMMU AND KASHMIR**

In the state/society relations at a local level, the dominant rural elites have used their influence over state institutions at different levels to secure individual profits and collective goals for creating ties of dependence. The

ability of dominant caste/class to capture the power at local level over communities and state institutions structures the discourse for the rural population to obtain resources. This enrich the prospects of authority among the marginalized the strategies like ostentatious feasts, criminal activities, money lending and services in lieu of political support is rampant. One of the important state institution for dominant caste/class power at local level is the *panchayat*. The 73rd amendment act under the Indian constitution aimed at increasing the rural representativeness at sub-state level by giving autonomy in making decision and empowers the marginalized communities through reservations of seats in local bodies. Perhaps the dominance of rural elites has not entirely waned away through this act but bolstered through new structures of power. The power of local patrons is conspicuous as new caste hegemony act as a rubber stamp or a proxy candidate for them. Power of elites is reinforced though the intra-caste divisions in village, money and muscle power. Local elites not only use the money, muscle power and violence to influence the voters but also lacks the political will to make welfare policies of state reach people. With the increasing non-agricultural activities and income, certain 'gatekeeping' roles have emerged through which the resources are secured by rural elites and control over 'rural labour' is reproduced. Locating within the diverse ways in which the rural landscape has unfolded in the 21st century, there are huge difficulties in generalizing about the political process and structures of power operating at local level across India. The Union Territory of Jammu and Kashmir (erstwhile J&K State) has concluded the first ever elections of Block Development Council, the second tier of the Panchayati raj system. Though the participation in election was presented as celebration of grassroots democracy in the troubled state, the micro view of different regions points to an opposite reality. Locating the field in *Kathua* district, the border district to Punjab and Pakistan, the present study seeks to address how the 'elite network' formed a significant trope to influence the choice of voters through the clientelism (*quid pro quo*). The paper will further seek to highlight the how the everyday differences emerging out of political and economic works among the elites were also circumvent through the religious conflict. Symbolic and non-material appeal was successful in producing distraction among the local power structure as the elections were held for first time. Therefore, the paper will empirically address the changing character and sources of domination in rural India with a focus on intersection of both material gains and non-material motivations among the elite structure.

**0528440 SHIKHA, SHILPI (Centre for the Study of Social Studies, Jawaharlal Nehru University, New Delhi-110067). VOCAL MUSIC' IN CLASSROOM: CONSTRUCTION AND RECONSTRUCTION OF ASSAMESE IDENTITY IN SCHOOL**

This paper aims at investigating the construction and reconstruction of Assamese identity through co-curricular activity focusing 'vocal music' as a subject. The paper is based on a comparison of vocal music curriculum between two Assamese medium private schools who have distinctive ideological standpoint. One school is a product of strong Assamese sentiments and other, more on broader Hindutva nationalism. The idea stems from the fact that Assamese nationalism which emerged as ethnic nationalism, always had a strong sense of cultural and political ideology. During the nationalist movement till independence, Assamese ethnic nationalism like many in India grew hand-in-hand with India's civic nationalism. After independence, especially from the period of late 70s until early 2000, Assam witnessed radical movement from particular armed groups, claiming a sovereign nation-state based on ethnic nationalism. At such a juncture the two schools studied here were setup. Scholars in sociology of education and political sociology have well established the relationship between nationalism and education. Schools, especially through its social science curriculum, imbibe the students with nationalist sentiment. However there is dearth in literature about co-curricular activities like music which too can develop an understanding of nationalism among children. Therefore, the central question this paper addresses are- how through music classes schools develop a sense of cultural nationalism among students? Can the comparison of the two schools with different ideology throw light on the contested idea of Assamese nationalism? How can the idea of inclusion and exclusion in an imagined Assamese nation be understood through music curriculum?

**Keywords: Vocal Music, Assamese nationalism, Cultural nationalism, Curriculum**

**0528441 SHREEYA, ANURAGINI (Department of Sociology, Jesus and Mary College, University of Delhi, New Delhi-110007). EMBEDDED OBJECTIVITY: THE EVERYDAY LIFE OF BUREAUCRATS IN TRAINING**

The process of bureaucratic training in India – which fresh recruits to the higher bureaucracy (IAS, IPS, etc.) receive after qualifying the Civil Services Exam, prior to holding office – involves an institutional component of training at specialized training academies. In this context, this paper will seek to present an insight into the training process, through ethnographic instances emerging from a close observation of the everyday life of trainees at one of these training academies – the Lal Bahadur Shastri National Academy of Administration (LBSNAA) at Mussoorie. It will seek to answer one central question - is there a bureaucratic self which can be discerned through the training process? And what are the coordinates of this self? The discussion will show that the training process embodies a complex modality whereby on the one hand it espouses the principles and ideals of a Weberian type bureaucracy marked by objective, and rule-bound neutrality and on the other hand it also trains the recruits into acknowledging, and perhaps also utilizing, personal connections, community and kinship affiliations. I will analyze two ethnographic examples to demonstrate this. The first is a hallowed tradition at LBSNAA called India Day where all trainees put up a cultural show representing the various customs and traditions of the country. The second is the obsessive search for potential partners and spouses within the training community, encouraged by the trainers and officials managing the institution. The bureaucratic self that is sought to be instilled through this training process is that of an embedded bureaucrat - a split personality - who is torn between being a value-neutral actor who is above community and kin affiliations and being a networked actor who uses such connections for his own ends. Instead of adopting a distinction between official and practical realms, I argue that the training process is geared towards producing a contradiction.

**0528442 SURENDRAN, AARDRA (Tata Institute of Social Science, Deonar, Mumbai). HOW SECURE ARE THE MOST SECURE? LESSONS FROM THE INDIAN PUBLIC SECTOR**

Discussions on permanence of employment rarely enter the quarter of workers within the public sector in India, as they are considered to be the most secure and privileged. However, this homogenous picture of public sector work is often misleading and fails to capture reality - both historical and contemporary of workers within the sector. This paper seeks to demonstrate the need to unpack the existing consensus on work within the public sector. It points at the increasing uncertainty that permanent workers within the public sector face today, as well as the history of contractualisation of work within it. Hierarchies of contractualisation and differential upgradation of technology have resulted in a range of changes within the labour process, as well as a complicated matrix of regulations that divide workers on the shop floor. The influence of these changes on mobilisation, of both permanent and contract workers, is also rarely addressed. The paper illustrates several such dilemmas by exploring the intersection of structural forces and particular phenomena on labour process, labour politics and the industrial everyday within the public sector.

**0528443 TRIPATHI, HARIOM AND MISHRA, SANTESHWAR KUMAR (Department of Sociology, T. D. P.G. College, Jaunpur). THE CONTRIBUTION OF INDIGENOUS SCIENCE AND TECHNOLOGY TO LIBERATION OF INDIA FROM UNEMPLOYMENT**

These are several types of unemployment in India like seasonal unemployment. Voluntary unemployment, fractional unemployment, casual unemployment, disguised unemployment, these are discussed in this article and also described about its removal by indigenous science and technology.

**0528444 VASUDHA, M C (Jyoti Nivas College, Bengaluru). STREET CHILDREN - CHILDREN DEVOID OF CHILDHOOD, STREET CHILDREN: FORGOTTEN VOICES, STREET CHILDREN- ABANDONED HOPES**

Children are looked upon as representing hope and promise of any society and as such deserve utmost care and concern in their nurturing and upbringing to groom and render them as valuable social assts. However, in many developing societies, including India, a large number of children are the victims of gross neglect, abuse and exploitation, suffering miseries and hardship as well as prospect of a bleak future, requiring empirical studies to focusing on the social realities pertaining to the issues concerning the causes and conditions of street children, that

are bound to be varying with socio cultural milieu in which they come to be born and brought up, particularly in the context of India, being a democracy wedded to the principle of 'welfare state'. Hence, an attempt is made in this paper to probe empirically into the incidence, causes, conditions and consequences of street children in the city of Bangalore. The findings are based on the data collected from a sample of 300 street children, identified as per UNICEF definition of street children, drawn from an estimated universe of 15000 street children, as per the records available from various NGOs and institutions working for rescue and rehabilitation of street children in eight zones of the city. The primary data were gathered through an interview schedule specifically devised for the purpose keeping in view the objectives of the study and the secondary data from various sources including the records available with the NGOs and government agencies dealing with child labor as well as women and child welfare. The findings seem to indicate that street children are the drop-outs, primarily from the deprived and disadvantaged sections of society, taking to begging and other menial jobs to earn their livelihood and sometimes to supplement their meager family income. In the process, they get marginalized, deprived of pleasures of childhood and opportunities, avenues and resources for realization of their aspirations. They tend to live a life of misery, distress and constant risk to life. Coming to the causes for their turning into street children, the findings seem to indicate that the precarious family conditions, broken homes, parental neglect, physical and emotional abuse in family, and a sense of abandonment by the kith and kin they suffer has driven them to the streets. The findings seem to suggest that the institutional machineries concerned with these street children fall short of insights, strategies and resources in dealing effectively with the issues surrounding the street children warranting a more humane and meaningful approach.

**0528445 VERMA, KOYAL (Miranda House, Delhi University, Delhi-110007). URBAN SPACE AND SOCIAL EXCLUSION: A STUDY ON THE AFRICAN MIGRANTS IN DELHI**

This paper is on urban space and social exclusion. It analyses social exclusion in the context of race. It focuses on discrimination faced by African migrants living in an urban neighbourhood of Delhi called Khirki Extension. It refers to Hall (1992), to analyse how race acts as a floating signifier and further gets associated with drugs, prostitution, illegal migration and cannibalism. This association led to the process of Othering and social exclusion of the migrants in Delhi, further leading to the emergence of African 'clusters' in Khirki Extension particularly. Hence, in this context, this paper *first* outlines the debate on ghettoization with reference to Chicago School, Park (1950) and Du Bois (1989). It also analyses the process of gentrification and formation of ethnic enclaves, Harvey (1985), Srivastava (2014). *Second*, it outlines the process of Othering highlighting the attitudes of the local community towards the migrants in the urban neighbourhood. It shows how terms such as *habshi* and *kala* were used to refer to the migrants. *Third*, it analyses the African clusters in Khirki Extension and highlights its emergence. Thus, in this framework, this paper outlines the way in which race plays a role in shaping a particular urban space and how social exclusion takes place in an urban neighbourhood of Delhi. The method used for this research is ethnographic using lived experiences of African migrants and in-depth interviews with the local community in Khirki Extension.

**Keywords-** Urban Space, Race, Social Exclusion.

**0528446 ZAMAN, RUKSHANA (Faculty of Anthropology, School of Social Sciences, Indira Gandhi National Open University, New Delhi). FROM MUNDANE TO THE SACRED: IDENTITY OF FOOD AS RITUAL OFFERINGS IN THE JAGANNATH TEMPLE AND THE NIZAMUDDIN DARGAH**

Food is one of the essential aspects of human existence. It has different context and connotations attached to it. Food works as a social construction as it varies from one society to the other. Societal norms dictate food. What is considered as sacred food for one society might be profane for another. Food in a society, the way it is being cooked or served, sacred or profane, can be perceived as a process of political-economic and symbolic value creation. An apple for example is a must inclusion in everyday food intake or diet, as prescribed by doctors and dieticians, owing to its nutritious values. However, if the same apple is a part of an offering in a temple as *prasad* or as part of *fatiha* in a dargah, it enters the realm of sacred food. Thus, the properties of being blessed make it divine that adds holiness to the already existing nutritious value of the food. Once a food becomes sacred, the pattern of



consumption also changes. Taboos and restrictions come into effect, as to how one ought to partake the food or carry it from one space to another.

This article would explore the identity of food how it transforms from being mundane everyday affair to sacred food. It would explore food as ritual offerings in two sacred spaces- the Jagannath temple and the Nizamuddin dargah, and how the connotation of consumption of the food changes with the context. The article would take into account the *Mahaprasad* (the food offerings in the Jagannath Temple, Odisha) as perceived by Sashimani *Marahi* (the last temple dancer). The narratives are abstracts from my doctoral research work based on fieldwork that included Sashimani's life history. I would also inscribe here my personal experiences of offering *niaz* (food prepared for *fatiha* prayers) in the Nizamuddin dargah.

**Key words: food, sacred spaces, ritual offerings, Jagannath temple, Nizamuddin dargah.**

## PART VI

### THEMATIC PANELS

#### 01. CONFLICT, WAR PEACE AND SOCIAL SECURITY

**0601447 BIBI, AMINA (Jawaharlal Nehru University, New Delhi-110067). THE SECURITY THREAT: TERRORISM FOR TAJIKISTAN AND INDIA**

This paper is mainly focused on the common problem of terrorism for the state of Tajikistan and India. This paper examines how India has been connected with Tajikistan in terms of historical linkages, strategic connection and, security issues. It discusses in detail about the radical Islamist groups which are commonly active in both the countries like Taliban, Al Qaeda and in some extent ISIS. The another side some of the regional terrorist groups active in Tajikistan, namely, Islamic Movement of Uzbekistan, Jamaat-I-Islami, Hizb-ut-Tahrir, United Tajik Opposition in collaboration with some international terrorist outfits like Al –Qaeda and Taliban. As these Islamist radical groups main ideology, aim and, activity in the name of jihad, the formation of an Islamic state, agenda of establishing Islamic Caliphate, Islamic law, revivalist movements, etc to destabilize the situation in Tajikistan.

Tajik people majorly affected after the independence of the Country due to their poverty, unemployment and by their Islamic faith has been molded into radical Islam with the influence of some external factors. And in Indian side Taliban, Al- Qaeda all are active to the Pak occupied Kashmir with the name of jihad. They are brainwashing the Kashmiri people. As India has its proximity in Pak occupied Kashmir with Tajikistan, it is important to stabilize Tajikistan. The paper has been highlighted the Tajik government response towards these terrorist outfits and Indian government policies to tackle the problem of terrorism.

**Keywords: India, Tajikistan, Terrorism, Jihad, Al Qaeda, Taliban, Islamic State.**

**0601448 DAS, ANJANA (Department of Political Science, Utkal University, Bhubaneswar, Odisha). US-IRAN CONFLICT: AN IMPLICATION FOR INDIA'S PIPELINE POLITICS**

For a nation, pipeline politics are significant for maintaining its geo-political status in the International sphere. One of the important consequences after disintegration of Soviet Union was emergence of immense of political and commercial competition to control flow of vast energy resources comprises of oil and natural gas from newly independent states Caucasus and Central Asia in Caspian Sea basin. As a result, America and western countries voiced strong concern that Iran try to export its Islamic government to Central Asia and try to maintain strong presence in it. This is all because of heightened tension between Iran and the US resulting from American sanction against Iran .So Iran aspiration to provide pipelines for the supply of energy resources has been long term objective basically to develop trade with this region. On the other hand, India and Iran have deepened their relationship and this relation is significant for energy resources. US opposition to presence of Iran in the region lead to contentious issue which revolves around two pipeline projects i.e. IPI and TAPI pipelines. The US strongly opposed IPI (Iran-Pakistan-India) pipeline project and this made India to stand still non-committal. Hence, America wants India to back its alternative project that is TAPI (Turkmenistan-Afghanistan-Pakistan-India) pipeline which would transfer gas from Turkmenistan through Afghanistan and Pakistan to India and this will help to keep Iran and Russian influence out of Central Asia.

This paper presents an overview of US-Iran conflict and exhibit how this conflict revolves around pipeline politics which also create an implication for India to import energy resources.

**Keywords: Conflict, Energy resources, Sanctions, IPI, TAPI**

**0601449 DEKA, BHASKAR JYOTI (Centre for International Politics, Organisation and Disarmament, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). RELATIONSHIP BETWEEN WATER AND WOMEN IN INDIA: RIGHTS REALISATION AND WATER SECURITY IN THE NEOLIBERAL AGE**

Access to water across all genders are not equal in India. Not only water creates history but also encourages exclusions and 'gender subordination'. Women, in India, have traditionally been made responsible for fetching water for the family but alienated from realising water rights citing the patrilocal norms. The lack of formal water right and exclusion from the social institutions, the concerns over water security of women becomes unimaginable, especially in the age of rising neoliberalism in India. This paper discusses the discourses of water as a right recognised at the international and domestic levels. Secondly, it investigates how the existing social structure in India is prejudicial in the materialisation of water rights and security. Thirdly, it analyses how the advocacy for neo-liberalisation of water governance becomes a curse on Indian women. In conclusion, the paper aims to theoretically understand the pollination of water rights, women, and neo-liberalisation, which is a research gap in the existing literature. In conclusion, it argues that the role of the state must be rekindled to ensure water security to Indian women in the neoliberal era.

**Key Words: Water, women, rights realisation, water security, India, neo-liberal age.**

**0601450 DHURUV, KHUSHBOO SEN (Shipra Hostel, Jawaharlal Nehru University, New Delhi-110067).  
THE EU-US SECURITY RELATIONS: CONFLICT AND COOPERATION**

The end of the Cold War has changed the security landscape in the world. The world order transformed from bipolar to unipolar. After the Cold War, the security relations of the European Union and the United States of America were changing. From 1945 to 1991, the relationship between both was neither contested and nor cooperative but it began after 1991. 1991 was a phase of development of events at the global level that changed the concept of security. However, these changes also led to some challenges in EU-US relationships.

The primary argument of the paper is, how has the security relationship between both changed after 1991? What was that development or causes who occurred conflicts and cooperation in the EU-US relations? Do the multiple crises and cooperation in the relationship offer an opportunity to strengthen the EU-US relations? However, the paper is only focused on 1991 to 2004 developments, and the major focus will be on the 2001 terrorist attack, 2003 Iraq war and security strategies policies, the 2004 EU-NATO enlargement and expansion, and the last EU-US as a global security actor. The paper will look at the major events that led to the changes in both relationships, helped the EU-US to emerge as a security guarantor to ensure security in Europe and the world.

**Keywords: The end of the Cold War, 2001 terrorist attack, Iraq war, EU-NATO enlargement, global actor.**

**0601451 JAYARAMA, M. AND SHIBINA, E (School of International Relation and Politics, Mahatma Gandhi University, Kottayam). CONCEPTUALISING INDIA'S ROLE IN SOUTH ASIAN SECURITY**

Regional aspects of security architecture play a crucial role in shaping the contemporary international relations. Analysis of security of a geographically-defined area facilitates threat factors of the particular region with commonalities. The security problems are differing from one region to another.

South Asia is critical region which still remains as one of the vulnerable regions in the world in terms of security. The end of cold war and the subsequent transformation of the global distribution of power had resulted in a multi-polar system. This structure had profound ramifications on the perceptions of security resulted in regionalism.

South Asia as a region has intractable security issues of terrorism, separatism, ethnic conflicts, nuclear issues, maritime security, boundary disputes, resource disputes, nationalism, religious fundamentalism, non-state actors etc. To maintain the regional supremacy has followed a coercive action against its smaller South Asian neighbors. Ethnic conflicts in Myanmar, Sri-lanka and migration to India, Issues of Kashmir policy of India, border issues with China are continuing in the region and these are determining India as a regional power.

India's neighboring policies has shaped the regional political and security arrangements in South Asia. However, extra regional powers in the Indian Ocean is an area of concern.China's Maritime interests and expansions

with infrastructure developments have made the region complex. As a regional power India observes Chinese expansion and change the neighborhood relations better through the policies of 'neighborhood first. 'However, Indian diplomatic relations within the region are more strategic.

This paper will explore the security challenges in the South Asian region and India's role and participation of neighbour countries in curbing the security threats in the region.

**Key words: Security, migration, security architecture**

**0601452 MISHRA, PREMANAND (West Asian Studies, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). ROLE OF CIVIL SOCIETY IN EXPANDING THE MEANING OF SECURITY: A STUDY OF CONTEMPORARY WEST ASIA**

Due to the anarchist nature of the international system, security has been traditionally conceptualized as state-centric. The understanding of security inordinately expressed under the rubric of state-centrism as realist school of international relations explains. The question of self-interest, civil-military relations, political rivalries among states and different groups remained as a dominant feature, shaping the traditional understanding of security carrying a relevant presence. However, there has been an approach in expanding such notions by rethinking the meaning of security through multiple lenses from food, economy, health, society, environment, polity, movements and etc. making the security framework more complex and interlinked. The role of civil society, therefore, is an important lens to expand the concepts of security and its different dimensions. The role of social movements, the pressure from the below in creating a genuine space for human security, environmental security and others that was absent in the traditional notion of security. The paper aims at understanding the new methods to approach the concept of security in linking with the role of civil society. The paper also argues to develop a framework on which the hegemonic state-centric understanding of security can be re-conceptualised particularly through the lens of civil society and the challenges that it offers. In contextualising this study, the paper will largely focus on West Asia for empirical study particularly in the aftermath of the Arab uprising in 2011. The role of new social movements and essaying a new emerging relationship between the people, society and the state both at the level of concept as well as in the realm of West Asia through the rise of Arab street providing a new method in understanding the linkage between civil society and security. The paper will also look into the question of globalization and its discontents as a significant area in expanding the notion of security. Arab uprising was an important event in that regard in the recent history particularly the question of human security. With the rise of the Islamic State and similar radical groups the human security is profoundly present, therefore, in rethinking the notion of security. The refugee question and its fall out as a new political challenge would also be discussed in the paper.

**Keywords- Security, Civil Society, State, Social Movements, West Asia**

**0601453 MOHARANA, JAGRUTI (Centre for African Studies, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). CIVIL WAR AND CONFLICT RESOLUTION IN SUDAN: INITIATIVE AND CHALLENGES**

The challenge for Christianity in the Sudan is essentially political, and it has to do with the course and outcome of the war of visions that has afflicted the country for more than four decades and in which religion has become a pivotal factor and a symbol of a multi-faceted identity configuration. The crucial question is not only whether the Sudan is Islamic but also the related question of whether it is culturally and racially Arab. On both questions, the South asserts a contrasting identity that is culturally and racially black African and religiously traditional with Christianity as the dominant modern religion. The question then is how the war will end or be resolved. Judging from the political and military dynamics, Sudan is about to revive Christianity as both a pivotal element of southern Sudanese identity and a significant factor in the legacy of Sudanese history, where Christianity, which once prevailed in the North, has a legitimate claim to a prominent place in the religious and cultural configuration of historic and modern Sudan.

In the face of widespread humanitarian needs caused by conflict, displacement, and natural disasters, the United States has been a major donor of humanitarian aid to the people of Sudan throughout the last quarter century. The United States has declared disasters in Sudan due to complex emergencies each year since 1987. As the largest international donor of humanitarian aid in Sudan, the United States continues to provide impartial, needs-based assistance to all accessible areas and populations, including displaced and otherwise conflict-affected people, individuals living in camp for IDPs, local communities hosting IDPs, and formerly displaced returnees. The United States supports democratic development in Sudan, as well as a transition from emergency assistance to development assistance where conditions and security allow. The United States played a key role in helping negotiate the 2005 Comprehensive Peace Agreement (CPA) between Sudan and Sudan Peoples' Liberation Movement (SPLM) that laid the groundwork for South Sudan's 2011 independence referendum and secession. Several disputes between Sudan and South Sudan remain unresolved post-independence, including border demarcation and the status of the Abyei region. The United States supports the efforts of the African Union (AU) to help the countries work through these issues.

**Key Word: Civil war, Conflict, Challenges, Peace, United States, United Nations, African Union**

**0601454 MURALIDHARAN, MEGHNA (.....). PROSPECTS FOR ENERGY SECURITY COOPERATION IN INDIA-AFRICA RELATIONSHIP**

The twenty- first century, like previous epochs, faces a variety of political, social, economic and ecological pressure that threaten stability and a potential for violent conflict in many areas across the globe. Of these, one of the most significant will be global competition for access to scarce supplies of critical resources: arable land, raw materials, minerals and the increasingly vital resources such as oil. Energy in this regard becomes important and not just for a particular community but for the universe as a whole. Energy occupies a pivotal position in the economic and political narrative of a country as well as in the foreign policy. At the global level the energy is said to be mixed and that the oil supply will not reduce in the years to come as well as plenty of energy will be available in the reserves of various sources of energy. At the same time environmental effects such as climate change is a major concern. Energy security has emerged as a major challenge for both developed as well as developing countries. Concerns related to energy security has become one of the main issues for the key policy community. Right from the time of the first oil, energy security has predominantly focused on ensuring the availability of oil in countries producing oil, especially countries in West Asia.

India's requirements in the energy sector domain will keep increasing because of its fastest growing economy. India needs partners along with whom it can work to address the challenges faced by the global energy market. Hence an important aspect of India's energy security strategy would be to diversify its energy constituents. In this regard, India's relationship with Africa pertaining to energy dimension needs to be explored. From the Indian perspective, increased cooperation in this sector seems to be beneficial for the vision of energy security, while for African nations, cooperation in this regard would be significant in strengthening bilateral cooperation with India. The vulnerabilities faced by both due to climate change, opens a plethora of opportunities for cooperation not only in conventional energy sources, but also in enhancing access to cleaner form of energy.

As India and African nations have been vulnerable to climate change impacts, opening a wide range of opportunities for deeper collaboration between India and Africa, not only in the responsible development and use of conventional energy sources but in enhancing access to cleaner sources. India has been spearheading the International Solar Alliance globally and there is much potential for India- Africa in this context. Thus the study would look into the various resource base in Africa and assess how India can intensify all its efforts in enhancing cooperation with Africa in energy domain. The study will also make a modest attempt in outlining the potential of Africa and its natural resources and examine the probable constructive bilateral engagement with India.

**0601455 RICHHARIYA, KATYAYINEE AND KUMAR SUMIT (Delhi University, Daulatram College, New Delhi-110007). USE OF HYBRID WARFARE AS A MEANS OF ALTERING SOCIETAL FABRIC**

This increase in the overlapping nature of conflicts all around the world also alter the nature of the societal fabric. In India, this has particularly led to intensification and aggravation of the prevailing fault lines and at the same time creating newer cleavages. In this paper, we try to trace the most recent turns that the Kashmir Conflict has taken - from Arabisation of Kashmiri identity to the void of declining influence of Sufi Islam being taken over by Wahabi Islam ( K - Files: The conspiracy of Silence ), through the phenomenon of Information warfare. Our main focus will be on the two most recent incidents, namely, the Balakot Airstrikes and the dilution of article 35 A and 370. This phenomena has been aggressively used by Pakistan to fuel internal dissension in Kashmir, especially after the introduction of the 1000 cut policy by General Zia Ul Haque. The antiquity of this form of warfare can be inferred from the debates of Loksabha on 27 February 1984 when the Parliament had been discussing "Reported anti-India propaganda on British television" ; only the means and the pace is changing. In February 1984, R.H. Mhatre, the Indian High Commissioner to the UK had been abducted by the members of JKLF ( Jammu and Kashmir Liberation Front ) to demand the release of their leader Maqbool Bhatt in return and this entire event had been insensitively covered by the British news channel by showcasing reactions of extremist leaders sitting in Britain as those of Kashmiri citizens. So we see that this phenomenon of information warfare has been used by various Nations to subvert facts and selectively portray them, in the way that suits their interest. In his native account of the Kashmir crisis, Basharat Peer writes that when the milltancy was at its peak during 1989-1990s, Pakistan used to broadcast the names of the Kashmiri youth who had successfully crossed the LOC to receive millatry training as people who sent messages requesting some specific songs to be played. FM radio still remains a primary source of instigating the youth during times of internet ban. After the restrictions were imposed in Kashmir on August 5 this year, the economic times reported on 11 September that it has been learnt that Pakistan army has been using FM radio to communicate with milltants. After the Balakot Airstrikes also, a US magazine named Foreign Policy published an investigation report of its counting of Pakistan's F-16 jets and found that none of the jets were missing. Later on, an official reaction from Pentagon distanced itself from any such investigation. The question which henceforth emerges is not about the veracity of the facts but the way in which they are portrayed. As J.S Mill had once remarked "Not the violent conflict between parts of the truth, but the quiet suppression of half of it, is the formidable evil; there is always hope when people are forced to listen to both sides; it is when they attend to only one that errors harden into prejudices, and truth itself ceases to have the effect of truth, by being exaggerated into falsehood".

**0601456 SANYAL, RIDDHI (Jawaharlal Nehru University, New Delhi-110067). AFRICAN UNION IN PEACEKEEPING: THE BURDEN-SHARING-BURDEN SHIFTING DYNAMICS**

The change in the nature of peacekeeping from traditional to multifunctional has been coupled with a simultaneous change in the nature of warfare from being inter-state to increasingly acquiring an intra-state character in recent times. Further, the proliferation in non-UN peace operations being conducted without the authorization of Security Council multiple times has led to the residence of authority and the monopoly of UN in the arena of keeping peace keeping to come under increasing scrutiny. Secretary- General Boutros Boutros Ghali's report named 'An Agenda of Peace' (1992) calls for regional organizations to be involved in activities of UN in regard to security and peace. The report highlights the necessity of using regional arrangements in mechanisms like peace-keeping, peace-building and preventive diplomacy. Between the periods of 1993-2005, discussions on issues of challenges to international peace and security and role of regional organizations has further led to the adoption of "A framework for Cooperation" calling for a pragmatic and flexible approach of UN to any regional crisis, mutual consultations and support in operational activities coupled with joint deployment of forces. Thus, a burden-sharing arrangement between the UN and regional organizations has been the focus.

The case of African Union's relationship with UN is, however, complex with its call for "African solutions to African problems." While the AU has come into the forefront in terms of "filling the gaps" of inaction in conflict-areas and assumed peace-keeping roles, its operationalization as conflict-manager faces challenges in terms of lack of possession of institutional, financial and military capacities. These factors have hindered effective action by AU leading to a tendency of appealing back to UN to take over the issues, taking up which is again subjected to the geo-political as well as the geo-strategic importance of the area by the major powers, often leading to a compromise in the principle of "regional impartiality" and delayed response.

The paper, in this context, delves into the question of whether the UN shifts the burden of regional peacekeeping to regional organizations and thereby, lags behind in assisting regional organizations (mostly financially and militarily) despite calls of burden sharing. Thus, it attempts to analyze the relationship between African Union and UN in terms of managing conflicts and dealing with peacekeeping and looks into the operationalization of the power-dynamics within the regions in terms of decision-makings in regard to conduct of peacekeeping operations.

**0601457 SOMAWANSHI, SHYAM S (Department of Sociology, Mahatma Jotiba Fule Arts, Commerce & Science. College, Bhatkuli, Dist: Amravati). THE ROHINGYAS CRISIS AND NATIONAL SECURITY: A STUDY**

This informative article focussed on an issue that has come to be known as ‘the Rohingya crisis’ is a tragedy that was in the making for over several decades and concerns the plight of hundreds of thousands of people belonging to the Rohingya-Muslim minority community in Myanmar’s Rakhine State. The Rohingya Muslims question is part of this larger problem. Historically, the entry of the military into politics and the continuing struggle for power between the military and the civilian—with the military seeing itself as the protector of the nation—is an outcome of the narrowly defined nationalistic outlook. In such a construct of what makes the Myanmar ‘nation’, the Rohingya-Muslim community are doubly disadvantaged.

India has the biggest number of refugees in the country in the entire South Asia and dealt with one of the biggest refugee crises in the world during partition of the country seven decades back, New Delhi does not have a refugee specific law.

The Indian government told the Supreme Court in 2017 that Rohingya refugees were “a threat to national security”, pushing back against condemnation of its plans to deport them. India refused to let the refugees enter their country because it posed national security threats. However, it was found that around 40,000 Rohingya's immigrants have taken shelter in Assam, West Bengal and Jammu & Kashmir. The news created a dissatisfaction among the general public that Rohingya Muslim settlements in Jammu (city) will change the demography of Hindu majority and may lead to violence in the future by giving reference to the exodus of Kashmiri Hindus by Kashmiri Muslims earlier. The presence of Rohingya Muslims in Jammu is thus considered as a sensitive issue for Indian security. The Indian security establishments opinioned that "Some Rohingyas sympathizing with many militant group's ideologies may be active in Jammu, Delhi, Hyderabad, and Mewat and can be a potential threat to internal security

According to United Nations High Commission for Refugees (UNHCR), more than 3 lakh Rohingya Muslims have fled Myanmar when the latest phase of violence broke out in the Rakhine province of the country.

The UNHCR stated that about 1, 68,000 Rohingyas had fled Myanmar since 2012, when clashes with Buddhists erupted in the trouble-torn Arakan region. Over 40,000 of those Rohingyas, who fled Myanmar, have entered India illegally, according to government's estimate.

There are about 16,000 UNHCR-certified Rohingya refugees in India. The government estimate puts the figure of Rohingya refugees living in India beyond 40,000 with maximum concentration in and around Jammu.

Active and effective role in these areas can help reposition New Delhi in the lead role in finding an enduring solution to the crisis.

The West led by the US has been increasingly taking a hard position against the Myanmar government over the Rohingya issue, while Myanmar’s neighbours including India and ASEAN have taken a constructive engagement.

**Key Words: refugees, South Asia, the UNHCR, Rohingya, Myanmar, Rakhine province, Arakan region, The West led by the US, ASEAN.**

**0601458 SUKHIJA, NEHA (University of Delhi, New Delhi-110007). BUDDHISM AS A SOLUTION TO VIOLENCE AND PEACE IN TODAY'S WORLD**

The 21st century is known to be modern and developed era of human civilization. The human race is advancing with rapid pace in all fields and is attaining a new level of modernization. There is innovation and advancement in every field whether it is science, medicine, technology, etc Coupled with technological advancement & curiosity the scientists have explored the earth in depth and are exploring the other planets in the solar system to quench their thirst for knowledge. This development in science & technologies has given rise to different kinds of gadgets for speedy decision making but has also made life equally complicated like a spider web in which we have got stuck. Materialistically we are progressing at a rapid pace only on external levels whereas internally we are deteriorating, because of lack of peace. Literally the word 'Peace' means a state of calmness, stillness, rest, silence etc. It is of two kinds internal and external, out of which internal peace is considered to be more important as it works as source for external peace. But today we are giving more importance to external peace and not internal. On one hand we are dreaming about world peace but on the other hand we are unable to bring peace to our own mind. In this materialistic world we are always dreaming for big house, cars, big bank balance and all sophistication but not giving any importance to the social value system in the society, which is gradually getting depleted. For our comfortable and ease, we have created many gadgets, equipments, machines etc. and our dependency on them has made us suffer more leading to loss of peace, dissatisfaction and frustration in life. The addiction to these gadgets is leading to 'lifestyle disease' which in turn is creating mental unrest and disturbance in one's life which is ultimately creating violence and suffering in this world. Nowadays people need fast money to lead a high class life for which they resort to all types of anti-social activities and crime like murder, theft, robbery, fraud or corruptions. This is becoming a growing problem for every country in this world whether developed, developing or under-developed. So, directly or indirectly the consequences of such incidents lead one to suffering and misery only. It is important to understand there is no kind of violence which can lead one to happiness or bliss, or which can bring profits to humanity. Many social scientist and philosopher have given various theories in order to solve this problem, but the analysis of this problem was initially started by the Buddha. The teaching given by Buddha is known as Buddhism which is completely based on human sufferings and way to come out from this suffering. Buddhist path leads one to a moral life, make them mindful and aware of thoughts and actions, and also develop one's wisdom and understanding. The paper seeks to examine the significance of Buddha's teachings in the present scenario.

**Keywords: Modernization, advancement, peace, pace, Suffering.**

**0601459 YAIPHAREMBA, I (Department of National Security Studies, Manipur University, Manipur). HUMAN TRAFFICKING AT MOREH CORRIDOR: ROUTE TO CHAOS**

Phenomenon of human trafficking in Manipur is threatening and cause of grave concerned on human security. Already affected by insurgency, cross border crimes are speedily germinating at Moreh corridor turning into a trafficking zone. Earlier, only cases of child trafficking by religious Samaritan to mainland India were reported, but, the scenario in the state swiftly changed when a group of nepalis were rescued from Imphal and Moreh that means to cross the border through Moreh to Myanmar in February 2019. The modus operandi of the traffickers to use the Moreh route and border crossing astonished the Administration. The big catch shows the vulnerability of the route, potential of organised crime and existence of trafficking mafia at the border. The study is Exploratory Research in nature which is conducted to investigate an issue in order to develop insight and ideas about its underlying nature. The method of research is Case Study in which phenomenon is studied through intensive/ in-depth analysis of an episode. Both primary and secondary data will be used for the study. Main Primary data of consolidated statistics of missing children both male and female from Manipur during September 2013- December 2017 in addition to different crimes highlight a scenario of violent activities against children in the state have been collected from NGO's working on Human Rights, Concerned resource persons through personal interview and methodically analysed. Another set of official data on human trafficking from Social Welfare Department, Manipur Government is also analysed that give elaborate information on adult trafficked victims in Manipur from 2013 to current year. Manipur is a fertile source of child trafficking and there is no doubt to reject it. Under development at interior hilly areas, non-functioning of school and colleges, lack of job opportunities and insurgency plays a major



role in instigating such move among the families and young minds to undertake the dangerous journey. With strict vigilance at Imphal airport and intercity land routes, main culprit are looking for easy and less protect routes to carry out their activities. The favourable option of Moreh corridor emerged at top spot due to open border and Free Movement Regime for citizens of the country. It is easy for someone to cross the border for tourism and marketing on other side and find the loopholes to travel further interior illegally to Myanmar to other Southeast Asian countries. The Nepali incident signifies the easy mode of crossing, operation of mafias that facilitate border crossing at undocumented routes with bases at Imphal city or in Moreh town. It is high time that Manipur Government and concern authorities take a good look at the vulnerability of the border in light of Act East Policy. The study, therefore highlight the methodical cause of Moreh corridor turning into a geographical proliferated route of human trafficking as an offshoot of open border.

**Keywords: Moreh, Human, Trafficking, Narcotics, Crime.**

## 02. DEMOCRACY AND HUMAN RIGHTS

### 0602460 AKHTAR, SHAMA (Department of Political Science, Aligarh Muslim University, Aligarh). MARGINALIZED GROUPS AND WOMEN EMPOWERMENT IN INDIA

In the ancient India, women held a high place of respect in the society as mentioned in *Rigveda* and other scriptures. Volumes can be written about the status of our women and their heroic deeds from the *Vedic* period to the modern times. But later on, because of the social, political and economic changes, women lost their status and were relegated to the background. Many evil customs and traditions stepped in which enslaved the women and tied them to boundaries of the house. The untold miseries and sufferings of women of the 19th century awakened the conscience of mankind. Many reformers like *Raja Rammohan Rai*, *Mahatma Gandhi* and other championed the cause of the emancipation of women. Women, as an independent target group, account for about 49.74 million and represent 48.3% of the country's total population, as per the 2001 census. Empowering women as a process demands a life-cycle approach. Therefore, every stage of their life counts as a priority in the planning process. Marginalization is the powerlessness and exclusion experienced by a group, resulting from an inequality of control of 'resources and power structure' within a society. Feminism argues that women are marginalized due to the patriarchal structure of society. It is a systematic process, so to say, a type of conspiracy woven like a web with the underlying characteristic features of domination and subordination forcing the women into eternal submission. But the feminist theory advocates equality- politically, economically and socially. It is also a symbol that refers to a process by which individuals or groups are kept in or pushed beyond the edges of society.

This paper is an endeavor to study the marginalized groups and women empowerment. It aims to highlight the discrimination and exploitation, especially in terms of empowerment. Empowerment envelops developing and building capacities of individuals and communities to make them a part of the mainstream society. It enhances the strength of individuals and communities. One of the basic purposes of the Indian constitution was to uplift the marginalized community. Our constitution, indeed, works for that and realizes this objective through fundamental rights to empower them which would ensure economic and social democracy. The action undertaken for the benefit of women should be the primary purpose as it is essential to have community of purpose, desire for welfare, loyalty to public ends and morality of co-operation as the very roots of democracy. For this aim in sight, 73rd and 74th constitutional amendments have, indeed, contributed immensely. This has been done to guarantee equality to the disadvantaged sections of society through constitutional provisions aimed at preventing discrimination and promoting social justice. Today, the working of panchayati raj system has given numerous kinds of opportunities to the marginalized communities. However, we still have to go long way in achieving our ultimate target of providing equality of opportunities to all the weaker sections, including women.

### 0602461 CHATTERJEE, MADHUMITA (Department of Philosophy, Maulana Azad College). AN INQUIRY INTO THE QUESTION OF DEMOCRACY AND HUMAN RIGHTS: FROM THE PERSPECTIVE OF THE DIGITAL ERA

In the dictionary the term "democracy" originates from the Greek words *Demos* which means people and *Kratos* which means a particular form of government. Thus the term democracy can be defined as a government by the people where common populace of the country exercise supreme power directly or by the representatives chosen through a fair and transparent electoral system. The question of human rights is intrinsically connected with the democratic culture since only in a democracy the conditions for fulfilling the essential conditions of human existence can be translated into practice. Democracy and human rights being mutually interdependent and mutually reinforcing assure respect for human dignity. Newer developments in the field of science and technology has affected the ideology and practice of democracy and human rights in real life. The paper therefore, explore, how scientific and technological innovations of the present century positively and negatively influence the traditional notions of human rights which forms an inalienable component of the democratic culture.

**Keywords: Democracy, humanrights, Digital technology.**

**0602462 KAUSHIK, ARUSHI (New Rajender Nagar, New Delhi). PHILOSOPHY OF HUMAN RIGHTS AND HUMAN DEVELOPMENT- A PERSPECTIVE FROM AMARTYA SEN'S CAPABILITY APPROACH**

The paper aims at interrogating the philosophy of human rights decoding the existing nature, content, justification, universality and legal status of human rights. It also attempts to understand that how human rights act as an effective and powerful tool in the political discourse. It explores the trajectory of human rights by locating the contemporary debate and the paradigm shift from the evolution of human rights. The paper elucidates the contemporary discourses of human rights by incorporating John Rawl's perspective of social justice and Amartya Sen's Capability Approach.

It, thus, engages with the idea of Human Rights and reflects on how Amartya Sen's capability approach revived the discourse of Human Rights and Human Development. The paradigm shift by capabilities approach has strengthened the foundation of Human Rights approach to development. The paper argues through empirical court cases that how the fight for upholding human dignity becomes the first and foremost criteria for the idea of justice and freedom. Amartya Sen's idea of justice is advocating 'development as freedom' and how his capability approach is giving a new dimension in the discourse of Human development in right based framework.

**0602463 MULAGE, BHEEMABAI S (KSLU's Law School, Navanagar, Hubballi). JUDICIAL RESPONSE TOWARDS THE PROTECTION OF PRISONERS HUMAN RIGHTS IN INDIA**

All the people are born free and equal in dignity and rights. This guiding principle of the Universal Declaration of Human Rights, 1948 lives strong in the hearts and minds of millions of people, as the declaration celebrated its 70th birthday in 2018. Human rights, being the birth right, are, therefore, inherent in all the individual as they are consonant with their freedom and dignity and are conducive to physical, moral, social and spiritual welfare. So, human rights do not mean merely the right to live with humanity but mean the right to live with dignity.

The fundamental object of criminal justice system is to provide protection to the innocent and to punish the offenders. Every society has a judicial system for the protection of its law-abiding members; it has to make provisions of prisons for the lawbreakers. However, it does not mean that the prisoners have no rights. Except right to movement, right to form an association, right to carry on any trade or business, occupation, prisoners are equally entitled to enjoy many constitutional and human rights like any other ordinary man.

As per the Constitutional mandates, every country's judiciary has a great responsibility to protect the human rights of their citizens. Though judicial interpretation that has in the Indian context, progressively expanded the human rights content of the law and the Supreme Court, in the recent past, has been very vigilant against violations of the human rights of the prisoners. However, in many cases still prisoners are denied the very rights that are fundamental to their being a human being.

With this view, author attempted to analyze the judicial response in standardizing the norms to mitigate the hardship caused to prisoner in the given circumstances. This analysis is divided into two parts: First part deals with different types of prison rights guaranteed under the Indian constitution under Article 21. In the second part, an effort is made to find out the present day situation of the prisoner in the jail and then some suggestions are highlighted to improve the position.

**Keywords: Prisoner, Human Rights, Violation and Judiciary.**

**0602464 PATHAK, JYOTIRAJ AND KALITA, JUMI (Department of Political Science, Bodoland University, Kokrajhar, Assam). UNWANTED NEIGHBOUR? ROHINGYA MUSLIMS IN BANGLADESH**

Forced migration is one of the most unfortunate phenomenons of human history. Majority of the migrant people have to stay in temporary shelter. Here the issue of their continuing stay (housing), livelihood, enjoyment of

basic rights like education, water, food, medicine and sanitation are grossly compromised which needs serious policy intervention.

For the past two decades, specially for last year's lakhs of Rohingya Muslims are forced to stay inside Bangladesh in refugee camps. Their living conditions as well as meeting the day to day life needs are horrible. Those people are facing tremendous hardships in the camps; they are denied the basic needs in spite of government support and foreign aid, which are not sufficient. In the long run, the population is approaching towards man made disaster. It is high time that the concerned stake holders must take appropriate steps so that the large number of the population are returned to Myanmar, which is a long and complicated process.

The paper would like to assess the humanitarian crisis of the Rohingya Muslim basically who are staying in the Cox's Bazar area; how to improve the living conditions of the camps along with India's role for a durable solution to it.

**Key words: Rohingya, camps, Bangladesh, rights, India**

**0602465 PATHAK, REENA (Department of Political Science, K. S. Saket P. G. College, Ayodhya, Faizabad). GANDHI'S CONCEPT OF DEMOCRACY**

Gandhi was a humanist philosopher. As such he believed in the rights of freedom and equality of the individuals which are possible only in a democracy. He was a believer in democracy. His own life was spent for safeguarding the democratic freedoms of the individuals. He always stood for the rights of the citizens. He firmly believed that power belongs to the people. He wrote, "Truth is that power which resides in the people and it is entrusted for the time being to those whom they may choose as their representatives. Parliament have no power or existence independently of the people."

However, Gandhi was opposed to the procedures and practices of British parliamentary democracy. He regarded British parliament as sterile and barren and criticized the apathy and selfishness of the members of that assembly. He regarded it as a talking shop. He was against the hopeless surrender of the parliament into the hands of Prime Minister who often lacked honesty and purity of feelings. He emphasized that Western democracies were dominated by the ruling classes which carried on the exploitation of its interests at the cost of the people. He wrote, "The people of Europe have no doubt political power, but no swaraj."

Thus, while a believer in democracy Gandhi was not a blind follower of what passed on its name. He was a bitter critic of the western democratic politics. He condemned western democracies for their imperialistic and capitalistic tendencies. He himself had to carry on struggle against the imperialism by Britain, the so called democracy. According to Gandhi some of western democracies even took recourse to fascistic techniques. He wrote, "Western democracy, as it functions today, is undiluted Nazism or fascism. At best it is merely a cloak to hide the nazi and the fascistic tendencies of imperialism." Hence, Gandhi did not see any good in the western democratic system. He even went to the extent of saying, "The European democracies are to my mind a negation to democracy."

Gandhi also did not believe in the majority principle of democracy. He was not satisfied with the external mechanism of democracy. He wanted a democracy where even the minority would not be co-erced, but persuaded, respected and convened. He believed in the conversion of the minority to the will of the majority and not to their being forced to accept it. He believed in the good of all the human beings. He would have never agreed to an arrangement in which the interest of the minority were sacrificed. He regarded it as an unfounded dogma of political science that the majority should yield always to the majority. He declared it a slavery to be amenable to the majority, no matter what its decision are. He said, "The way of approaching to a question is not to examine the numerical strength of those behind the opinion but to examine the soundness of the opinion on merits or else we will never reach a solution and if we reach one it will be a blind solution simply because it is the wish of the largest body."

**0602466 VISHWANATH, JYOTHI (Department of Studies in Law and University Law College, Bangalore University, Bangalore). SOCIO-LEGAL PERSPECTIVES OF TRIPLE TALAQ WITHIN THE CONTEMPORARY DEMOCRATIC INDIA: A CRITICAL ANALYSIS**

The Indian democracy represents a mosaic of humanity consisting of diverse religious, linguistic, racial and caste groups. Apart from the native Hindu religion, the religions arriving from outside the sub-continent including Christianity, Islam and Zoroastrianism have developed deep roots similar to the local faiths. Hindus, Buddhists, Jains, Christians, Muslims, Parsis, Sikhs and Jews constitute the present day India. With over 172.2 million Muslim populations, Indian Muslims are the third largest congregation in the world and second major community in India, next only to the Hindus.

There exists a huge, astounding and dangerous undercurrent of diversities flowing beneath this nation, personal laws being one among them. Existence of distinct personal laws has rendered the Indian legal system pluralistic in nature, similar to the colonized states in Asia and Africa. Having been evolved from different religions, these personal law systems embrace matters including marriage, divorce, maintenance, minority, guardianship, custody, gifts, adoption, wills, intestacy and succession.

Despite vague statistics pertaining to divorce in India, divorce rate is comparatively high among the Muslim community in India. Apart from 'Shariat' rules governing the divorce matters among the Muslim community in India, there also exist parallel laws governing the issues of divorce including the Dissolution of Muslim Marriages Act, 1939 and Women (Protection of Rights on Marriage) Act, 2019. Amongst the various ways of dissolving a Muslim marriage, Triple Talaq, more specifically known as talaq-e-biddat, has turned out to be the most contentious one in the recent times. It is most frequently and heatedly discussed, debated, litigated, deliberated and adjudicated in the political, social, religious, academic, legal and judicial circles since it raises the most complex issues pertaining to justice, human rights, gender equality and secularism. While the most famous case of Shah Bano Begum in the technologically nurturing era of 1970s raised mixed issues of triple talaq and the maintenance rights of the Muslim women, the recent case of Shayara Bano in the modern technologically advanced scenario has been a stepping stone in rendering the practice of triple talaq unconstitutional and criminal in nature.

Time and again, one is impelled to think about the contemporary relevance of the practices and traditions associated with a religion. A legal system making way for easy divorce leads to disruption of human rights and family life. Amidst this scenario, this research paper embarks upon an academic investigation of the issue of triple talaq and its impact on human rights in a democratic setup. The paper presents a discussion sans a politico-religious perspectives and mostly confines to the socio-legal and judicial perspectives pertaining to the practice of triple talaq. It analyses the nature of triple talaq, the historical perspectives and examines the relevant Shariat rules. It briefly refers to the legal position relating to triple talaq in different countries of the world and provides a closer look at the social, legal and judicial perspectives relating to triple talaq in the Indian context.

### 03. ECOLOGICAL AND ENVIRONMENTAL PROTECTION MOVEMENTS

**0603467 KUMAR, SHRAVAN (Department of Buddhist Studies, University of Delhi, New Delhi-110067). ENVIRONMENTAL ETHICS IN BUDDHISM: A RELIGIOUS APPROACH**

Today's world has achieved incredible growth in the field of technology and material development. At the same time humanity is facing insecurity, fear and conflict almost all over the world. The human beings are facing the challenges from technological growth and also ethical path of social and psychological development. We are all aware of the degradation that is happening to the environment around us. An alarming situation has emerged because of the exploitation of nature and mistreating with different natural resources by the greedy mind. On the other hand, animal beings never destroyed the nature as badly as the human being caused devastating destruction in the earth. Population explosion, misuse of technology, pollution, global warming, natural resource depletion, loss of biodiversity etc are some of the problems that are causing irreparable hazards to our environment. Whenever we talk of environmental protection we always stress up on the role of government, legislation, & law enforcement. But more than anything else, environmental protection is largely the responsibility of people and not simply the government. We need to think hard about these problems as these require urgent attention so that our future generation will not suffer. What duties do humans have with respect to the environment, and why? We need to think of the second question, WHY? Do we really need to think about the nature for our own gain or think of environment as a whole, which include all living and non-living beings? Environmental ethics concerns about human being and ethical relationship with nature. This awareness of protecting life and living environment has been generated in recent time. But surprisingly, centuries ago in Buddhism, it is one of the main basic laws. The Great Buddha, some 25 centuries ago expressed a deep ecological relation between the human beings and the nature. All existing things viz. man, animal, plant and nature itself are dependent on one another. A balanced interrelationship between all that can make a balanced ecology. Buddhism drives us to realize and understand our responsibility towards natural environment, flora and fauna. One cannot think of remaining untouched by the nature, it would be unrealistic to remain isolated from nature. The aim of this paper is to meet the present environmental issues depending on living and non living beings to the fullest happiness based on Buddhist literature.

**Keywords: Environment, Biodiversity, Nature, Technology, Buddhism.**

**0603468 LAKHERA, CHITRA (Ashoka Trust for Research in Ecology and the Environment, Bangalore). VIOLENCE, NATURE AND GENDER: A LUHMANNIAN ANALYSIS**

There is substantial evidence since the 1970s that reveals a similar trajectory of oppression and decimation for both women and nature. While there are certain caveats to this particular framing of these problems of ecological catastrophe and increasing violence against women, there is also a deeper interconnection at play which often remains underestimated. Important theoretical and empirical advancements that point decisively towards this stem from increasing interest in Queer Nature. Once liberated from the strict binary of men versus women, Queer Nature begins to delve deeper into the questions of gender and sexuality and their relationship to the ecological crisis. However, it does not offer sufficient reasons regarding violence against nature, women and the Queer. This paper argues that one of the ways to explicate these reasons is to engage in an immanent systemic perspective. One such perspective is offered by Niklas Luhmann. Using Niklas Luhmann's System's theory it is argued that a deep systemic pathology which is independent of the individual or any group, lies at the centre of all forms of violence. In doing so, the paper sketches an alternate understanding of violence and shows that violence against the Queer, Women and Nature are merely different manifestations of the same systemic pathology.

#### 04. ETHICS OF SCIENCE AND SOCIETY

**0604469 WARRIER, PRASANNA (St. John's Research Institute, India). LENSING THE VOID: USING THE GRAVITY OF CONCERNS REGARDING THE AADHAAR TO DETERMINE THE NEED FOR PEOPLE CENTRED MECHANISMS TO GOVERN BIOBANKING AND DATA SHARING WITH RESPECT TO GENETIC RESEARCH IN INDIA**

The Unique Identification Authority of India was established in 2009, and subsequently became a statutory body under the provisions of the Aadhaar Act, in 2016. While the Aadhaar campaign - the collection and storage of population-wide biometric, socio-demographic and other personal information - has been hailed as one of the most sophisticated ID programmes in the world, it has raised several concerns regarding identity, privacy, confidentiality, data protection and surveillance among other allied topics. These issues were fuelled by the fact that the Aadhaar had gone from being a programme of voluntary participation, to a mandate intent on channelling individuals' most personal information into government custody. Responding to the dissent expressed by the public about these concerns, the Supreme Court of India, in 2017, held that the right to privacy is protected as a fundamental right by the Constitution of India - shedding light on the imminent need to update data protection laws in the country. While the Personal Data Protection Bill was announced in 2018 - upholding principles such as data minimisation, purpose limitation and the right to be forgotten - it has yet to be passed as an act of parliament. Here, a parallel can be drawn to biobanking - the process of organising collections of human biological material and associated data for research purposes - in the Indian context and the ethical, legal and social issues that accompany the same. But, till around 2013 there has been relatively little discourse on potential bioethical issues related to biobanking in India. Further, while the number of biobanks established for research and diagnostics purposes in India are increasing, there remains insufficient data to assess the nature of the concerns that arise from research using genetic information linked to socio-demographic data associated with stored human biological samples. In this sense, some of the questions left unanswered are: Who will have access to my data and where will it be stored? How secure will it be? How are disputes regarding ownership and benefit sharing addressed? How can communities' values and beliefs be safeguarded while conducting scientific research? To overcome this obscurity, we use the gravity of concerns regarding the Aadhaar to lens the extent of the ethical void within genetic research, in the Indian biomedical field. By garnering inference from the events that surrounded the Aadhaar, we determine that the need for people centred mechanisms - upholding principles of respect, public good, privacy, confidentiality, trust and reciprocity - to govern genetic research is essential for scientific progression in India. By analysing the DNA Technology (Use and Application) Regulation Bill, we see that this need is more pressing in the post-genomic era, since the advent of technology has significantly reduced the time, costs and errors associated with whole genome sequencing and genetic testing, thereby widening the scope for their utilisation.

## 05. GLOBAL WARMING AND CLIMATE CHANGE

### 0605470 BARIK, GITANJALI (Centre for Russian and Central Asian Studies, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). ENVIRONMENTAL DEGRADATION AND HEALTH SECURITY IN AZERBAIJAN REPUBLIC

Azerbaijan is one of the South Caucasus Countries which has got independence from the Soviet Union, on August 30, 1991. During the first year of independence, Azerbaijan has faced various challenges such as social and economic crisis, political instability, and the major issue was the Nagorno-Karabakh conflict which permanently displaced most of the people. All these critical situations got relatively stabilized when a stable government came to the power. From that day the country has been successively developed politically, economically and socially. Besides developmental sector, the country has been facing environmental problems such as air pollution, water pollution, soil erosion etc. Due to heavy oil and gas reserves, a large numbers of oil and gas industries are there because of Azerbaijan being the birth place of modern oil industry. Also, the economy is still largely based on the petrochemical industry. A century of oil production and environmental neglect has left much of environmental issues. Pollution from extraction, refinement and transit of oil and gas has severely degraded the quality of water, air, and soil. The Caspian and inland waterways also suffer from chemical contamination caused by agricultural runoff and industrial toxic waste. These factors are highly affected to the public health. As a result, the country has experienced lots of health issues like diphtheria, malaria, TB, polio etc. Therefore, the healthcare system in Azerbaijan has been improving in recent years with the support of World Bank. The ministry of health, with funding assistance from the government of Azerbaijan and the World Bank, is currently undertaking the largest public health reforms in its history the health system reform project. Many international organizations are working to promoting human security in the World such as FAO, UNICEF, World Bank, USAID and WTO etc.

This study I explores the causes behind Environmental degradation in Azerbaijan. The study also deals with the impact of environmental degradation and how people are suffering from diseases along with the role played by International organizations towards Environmental protection.

**Keywords:** Azerbaijan, Environment, Health security, Oil and gas.

### 0605471 GEETHALAKSMI, T S (Bengaluru Central University, Bengaluru, 560001). CLIMATE CHANGE

Climate change is one of the serious contemporary issues of the world, it is a periodic notification of our earth's climate or it is rise in the average global temperature due to an increase in the counteraction of atmospheric greenhouse gases resulting in numerous climate shifts and impacts around the globe.

In Britannia, Human action has triggered a vast cascade of environmental problems that now threaten the continental ability of both natural and human system to nourish; solving the critical environmental problems of global warming, water scarcity, pollutions and biodiversity loss are perhaps the greatest challenges of the 21<sup>st</sup> century will we see to meet them?

As we all know that weather is always changing owing to instabilities in the atmosphere along with the variation of the weather climate also vary day to day

There are various causes for the climate change they are ;

1. One of the main causes is our sun, the brightness of it rises as it ages, to the amount of the energy to the earth also rises
2. The movement of tectonic plates is another cause this results in the changing of the shape, position, size, height of the continental mass and atmosphere etc
3. Carbon dioxide methane and water vapour absorb the infrared radiation from the earth surface and reradiate back as greenhouse effect
4. The periodical orbital variation of the earth and axial tilt with respect to the sun causing the solar radiation disturbs the earth's surface



5. Human activities are elevated rise to industrial revolution
6. Botanist, Naturalist, Paleontologists, Geologists and Paleontologists early centuries recognized Geologic & Biographic evidence to measure changes the climate red heads of the earth has indicated aridity but now turned as humid region
7. Another very important cause is global warming, the average annual Temperature the earth's surface was raising since the late 1800. Global warming and climate change are often used interchangeably but global warming is more accurate as it caused by human
8. Latitude also responsible for the climatic change by farness from the equator
9. Warm current warm the air about it and warms the coast and vice-versa in the case of cold current

**0605472 GOYAL, R. S (Engineers Enclave, GMS Road, Dehradun). IMPACT OF CLIMATE CHANGE ON HUMAN HEALTH IN INDIA: ISSUES AND PRIORITY CONCERNS**

Global reports have suggested that India is among the nations highly vulnerable to the impact of global warming. With 17% of world population and just 2.5% landmass and 4% of water share, India faces a big challenge in turbulent weather patterns. Human health is most affected by these changes. This paper analyses impact of climate change (largely infused by global warming) on the health of people in India. It examines the key aspects of climate change that are perilous to the health of people, how these are mediating their reach, what are their impacts, and to what effect. Irony of climate change is that most damage to earth's climate is caused by developed countries by high emission of greenhouse gases but its consequences are faced more by people in developing countries particularly, in thickly populated tropical climatic zone and living in poverty conditions.

Global warming is a long-term rise in the average temperature of the Earth's climate system mainly caused by human activities. Many observed changes since mid-20th century have been unprecedented compared to records over decades to thousands of years.

According to Intergovernmental Panel on Climate Change (IPCC) 2013, the globally averaged combined land and ocean surface temperature data as calculated by a linear trend, show a warming of 0.85 [0.65 to 1.06] °C, over the period 1880 to 2012. It further notes that if the nations of world do not take urgent action, the warming pattern will only expedite.

What are the consequences of climate change or rise in earth temperature in particular? How does it affect us? The impact of global warming is mediated through extreme weather events like heat waves, excessive rains, floods, droughts, rising sea levels, water and food supply impacts or other similar factors. In recent decades, there is significant increase in intensity of rainfall events in several parts of India and glacier lake outburst floods in mountainous regions causing huge floods killing thousands of people, displacing millions of people not counting the loss to physical assets, every year. On the other hand, the numbers of Monsoon deficient districts are increasing with every passing year, ushering in drought scenario. Number of heat wave spells has sharply increased in last few years. According to data available on the website of Ministry of Statistics and Programme Implementation, between 2010 and 2016, the country witnessed a total of 178 heat wave bouts, but in 2017 alone India suffered 524 heat wave spells. Worst-affected states were Rajasthan, Madhya Pradesh, Maharashtra and Andhra Pradesh where a total of 297 heat wave spells were experienced in 2017. Increasing water scarcity in most part of country is creating emergency like situation particularly in summer months, leave alone the quality of water being made available.

All these changes has created conducive environments for numerous health consequences including increase in spread of vector-born, communicable and non-communicable diseases and, malnutrition, reduced food production as well as decline in nutrition value of staple foods.

Millions of Indians are at the risk of becoming nutrient deficient by 2050, as rising levels of carbon dioxide (CO<sub>2</sub>) are making staple crops such as rice and wheat less nutritious. So far a decline between 10 to 14 % is seen. Researchers at Harvard TH Chan School of Public Health also found that India would bear the greatest burden, with an estimated 50 million people becoming zinc deficient. As many as 38 million people in India are at the risk of becoming protein deficient, and 502 million women and children becoming vulnerable. Child stunting is projected to

increase by 35% by 2050 compared to a scenario without climate change. This research notes that decisions we are making every day -- what we eat, how we move around, what we choose to purchase -- are making our food less nutritious and imperilling the health of other populations and future generations.

Rising temperature has significantly influenced the spread of vector born diseases in country. *Dengue* and *Chickungunya* have been on the rise, burden of Malaria has shown a slight decline for now. In arid and semiarid regions of India, where malaria is epidemic, rainfall variability has been shown to drive the inter-annual variability of the disease and was the basis of one of the first early-warning systems for the disease in this region. Evidence suggests that rainfall variability plays an important role and that a long-term trend in increasing temperature during the 20th century is sufficient to significantly increase the abundance of vectors. Monthly parasite incidence was positively correlated with temperature, precipitation, and humidity. The implications of this association as it relates to long-term climate change remain an important open question. For other regions of India, monsoonal rains have shown an increase in the frequency and magnitude of extreme rain events, whereas the frequency of moderate events has been decreasing, with no significant change in the mean in the last 50 years. Temperature plays a major role, especially at high altitudes, preventing epidemic malaria from spreading into the highest altitude regions. The consequences of climate change in highland regions are an important open question based on future temperature predictions in these regions. Little is known about the influence of climate variability or climate change on the prevalence of malaria in Indian urban areas. The issue of urban malaria becomes even more important when considering the rapid expansion of urban and semi -urban environments, water storage techniques, and rising poverty levels. These diseases are also likely to spread into areas where colder temperatures had previously limited transmission. Heat waves are likely to result in a very substantial rise in mortality and death, and injuries from extreme weather events are likely to increase. Increase in levels of cardiovascular and other non-communication diseases including mental health is also linked to climate change.

A greater understanding of the relationship between climate variability and human health in a country such as India could aid in the development of new prevention strategies and early warning systems, with implications throughout the developing world. Future studies must work to more explicitly define the relationship between climate variability and emerging and re-emerging infectious diseases as well as chronic diseases related to cardiovascular and respiratory illness, asthma, and diabetes.

Successful work in this area will require the health community to partner closely with climate scientists and development professionals to move beyond the assessment of climate variability and disease outcomes to predictive models accounting for climate change to facilitate targeted adaptation. An integrated disease surveillance system already exists under the director general of health services; any new work on climate change and health should be linked to the already existing system.

Millions of people below the poverty line and those in rural areas represent high-risk populations who are exposed to myriad health risks, including poor sanitation, pollution, malnutrition, and a constant shortage of clean drinking water. However, as awareness and public health infrastructure increase, the burden of climate-related disease may be negated.

**0605473 KAUR, RAMANDEEP (S.U.S. Government College, Sunam, Sangrur, Punjab). CLIMATE CHANGE AND HUMAN RACE**

Climate change is the main concern of all the living beings. Recently, Most of the inhabitants of the global village have participated in climate strike. Their aim: to make themselves heard as they protest global inaction and apathy on the issue of climate change. Arctic blast in US, forest fires in Amazon and Australia are the examples of climate change. A recent study by Lancet Countdown on Health and climate change reveals that severe malnutrition, infectious diseases and heart disease are increasing as temperature is rising, due to global warming. It results from numerous cofactors arising from the global economy's interdependence on carbon dioxide (CO<sub>2</sub>) emitting hydrocarbon energy sources . Smog in different parts of India is due to release of greenhouse gases at almost every stage of production, transportation, storage, delivery & disposal. Every young individual in this world,

irrespective of their class and place in society, be empowered and echo Greta's words: "I have learned you are never too small to make a difference".

**Keywords:** Climate strike, Global warming, Smog

**0605474 KUMAR, RANJIT (Room no-203, Sutlej Hostel, Jawaharlal Nehru University, New Delhi-110067). ENERGY SECURITY, CLIMATE CHANGE AND POLITICS OF CLIMATE CHANGE IN INDIA: A STUDY OF NATIONAL ACTION PLAN ON CLIMATE CHANGE**

Energy development and energy efficiency is the barometer of economic progress. Understanding energy demand, energy efficiency and how efficiently energy is used, is the interest for policy makers as both aspect influence economic development, and environment sustainability. This paper deals with the rise of energy demands, and various measures adopted by Indian policy makers to meet this demand. In 2008, India enacted its National Action Plan on Climate Change (NAPCC), with the objectives like achieving a sustainable development, which established a synergy between economic development and environmental sustainability. NAPCC comprises eight missions to tackle the climate change in India. This proposed paper deals with two missions i.e. National solar mission and National mission for enhanced energy efficiency. The paper attempts to argue that India has witnessed a paradigm shift in its approaches from cynicism to engagement, engagement with entitlement, bargaining oriented pragmatism, and from traditional to co-benefit approach. There is a strategic shift in India's policy and principles .e.g. introduction of coal tax, subsidy cuts in fossil fuel, RE certification, perform, achieve and trade system, providing incentive (tax, and fiscal), carbon pricing, and enactment of various acts.

This paper would also be dealing with various aspects regarding the factors which influence in policy making process on climate change, actors involved in that change, institutional performance and their extended help in smooth implementation, and debates surrounding climate change issues in India. Therefore, this paper would also explain certain questions, such as, have domestic climate change mitigation policies been successful? If yes, why have they been successful? How does India's NAPCC imply for its approach to climate change negotiation? What are the implications it has for domestic development choices? How widespread and substantial are both synergies and trade-offs across pressing India's development concerns such as job creation, energy security, energy access, local environmental quality and climate mitigation? What are the factors on both demand and supply sides which are likely to shape India's energy future and with what implications for India's contribution to global mitigation efforts? How does implication of efficient energy use would contribute in low carbon development pathway? The explanation and arguments of this paper is based upon the information gathered through primary resources like data and report from concerned ministries and some authentic secondary resources.

The concept energy security, which seems to be a 'vague idea' but it, is getting too much popularity in both scientific arena and in political discussion. Because, this is the sector, where government or scientists have no clue about how to overcome from sudden rise in demand of power energy? It means, India is still struggling to maintain the pace of the development and trapped in vicious cycle of shortage of energy, where 'energy security'. In this paper, I will highlight the issue of 'energy security' from Indian perspective. Firstly, this paper would elaborate the conceptual evolution of energy security, its various dimensions and concerns related to energy security issue in current scenario through the lens of NAPCCs.

**Keywords:** energy, NAPCC, economic development, policy, sustainable development

**0605475 NONGMAITHEM, JOSEPHINE (Department of Social Work, Delhi University, New Delhi-110007). A STUDY OF COMMUNITY VULNERABILITY AND CAPACITY IN THE CONTEXT OF CLIMATE CHANGE IN MAJULI, ASSAM**

Majuli is a river island located in the midst of the Brahmaputra River in Assam. The impacts of climate change have been felt in Majuli with continuous shifts in rainfall pattern as well as changes in the temperature. This study gains an insight about the nature of impact of climate change related phenomena on the life and well-being of the communities, with special focus on diverse constituencies like women and tribes. Additionally, it explores the

nature of resilience and coping strategies that people have evolved/are evolving to cope with the impact of climate change. The study also addresses the current lack of social work on environmental issue like climate change. The purpose is to determine what role social workers can play in dealing with these issues, and to determine what barriers may be limiting their action. The intention is to engage social workers with this topic, so that they may see the role that they can and must play in mitigating these issues. The study adopts mixed method. Both quantitative and qualitative analysis are undertaken to procure an understanding of the research problems subsumed within the study. The research design is descriptive in nature as it describes the lived experiences of people/communities who have faced/ are facing various risks from climate change, as also the local knowledge system and resilience of the communities to manage the impacts that have been triggered by the climate change phenomena.

**Keywords: Adaptation, Climate change, Flood, Green Social Work.**

**06. HISTORY AND PHILOSOPHY OF SCIENCE**

## 07. INFORMATION TECHNOLOGY, MASS MEDIA AND CULTURE

### 0607476 ANITHA, KALUVOYA; YAMMANUR, BHAVYA AND SREE, C. DHANYA (Department of Communications and Journalism, St.Francis College for Women, Hyderabad). **ROLE OF SOCIAL MEDIA IN GENDER SENSITIZATION AMONG TEENAGERS OF HYDERABAD**

World is changing so as our lifestyles, but certain taboos in society will remain forever. Many unjustifiable taboos are still obstacles for overall growth in our country since decades. Initiatives from governments, NGO's and media are not less in number, but results are always unsatisfying. Now we live in the world of New Media where every user is also a producer and receiver of countless messages daily, this unique feature of new media made it a powerful tool for influencing many lives at a much faster speed. Social media is never the less playing a major role in Gender Sensitization. Gender sensitization is just not a women issue, it is people's issue. It basically refers to the modification of the behavior of teachers and parents towards their children, which is leading to a causal effect on a gender in the society. We can say that this is the origin from where children are thought that boys are masculine, bread winners, protective in nature, commanding masters and ultimately warriors. On the other hand, girls are to be loving, obedient, caring and to be selfless and are dedicated to satisfy their family needs. In this context, this paper examines social media platforms such as Facebook, twitter, instagram, blogs, whatsapp etc to determine the role of social media on gender sensitivity. The main aim of this paper is to describe the trivial point of 'how social media posts are bringing out gender sensitization among teenagers of Hyderabad'. The study is based on online survey on social media users from Hyderabad city between the age group of 13-19 years. Self administered questionnaire will be sent through online to 50 teenage social media users to achieve the set aim of the study.

**Key Words: Social media, gender sensitization, role of media, teenagers, Hyderabad, online survey.**

### 0607477 DEIVENDRAN, MUTHUVEL AND ENIYAN, M.R (Department of Anthropology, University of Madras). **A STUDY ON THE CONTEMPORARY CHALLENGES OF KNOWLEDGE AND MODES OF PUBLIC DISCOURSE IN THE CULTURAL MODERNITY AND BEYOND**

With innumerable quandaries, such as climate change, faced by the global civilization not excluding aloof simple societies in the age of technological era, there has been this challenge of management and handling of knowledge and responses of the mass consumers in the present milieu. As a part of cultural studies, in an interdisciplinary sense, this article involves a holistic theoretical study on the forms of knowledge traditions from varied cultures across space, technology and time, and its reflection upon the collective awareness and the order of those mass cultures through semantic, psychological, sociological and philosophical observations and arguments from careful readings of secondary literature. The article further attempts to explore roles of mass media from the times of modernity as well as its symbiotic relation with the phenomena of postmodernism on how the media platforms get complicated influences from other structural institutions for stability and solidarity. Dealing with the notion of knowledge is itself an empirical as well as a philosophical conundrum through the theory of postmodern philosophy, and with influence of such analogous notions of moral relativism, knowledge emanated through public discourses obscures coherent and contextual understanding of consumers. Certain challenges of the problem are studied through the lens of economic sustenance of overall structures which shows an different perspective that there are changes in the ways of thinking and responding to social changes; knowledge of self and other becomes incoherent in cyber and techno-cultures in addition to the development of a consciousness that the knowledge acquisition is no longer related to training of minds but as a form of exchange value in the system. Further the article notes the transgressing process between art and entertainment along with the depreciating value of myth and cult into mere exhibit value which leads to the inquiry that the ritualistic basis in art and knowledge is challenged by the notions used as means of mass media. With aimed subaltern studies in India, the study ascertains that major portions of masses remain indifferent or muddled up with social circumstances due growing phenomena of entertainment filled public discourse modes and hegemony as a plausible way to organize such growing masses. The article concludes that the multifactorial influences concerning the challenge of public discourses shall require more public attention through socioeconomic, political, and cultural spectrum for a better holistic understanding of the rooted causes and effects of the problem.

**0607478 GUPTA, SOURAV (Central University of Odisha). COMMUNICATING TRIBAL CULTURE THROUGH SOCIAL MEDIA-REFLECTION OF PARAB IN FACEBOOK PAGES OF KORAPUT, ODISHA**

The Koraput region of southern Odisha is a tribal dominated area, backward in terms of materialistic development, but rich in terms of indigenous culture. The social media aided by a sudden onslaught of wireless internet in the region has led to a change in media access & usage. The area is going through a phase of tradition colliding with modernity. The present paper examines the use of social media in the region through a content analysis of selected Facebook pages during *Parab*, the district tribal festival.

**Keywords: Facebook, Koraput, Communication, Culture, Technology**

**0607479 KUMAR, K. RAVI (Department of Mass Communication and Journalism, St. Francis UG and PG College for Women, Hyderabad). MEDIA CREDIBILITY: MAINSTREAM MEDIA VS SOCIAL MEDIA**

Credibility is an essential feature of effective communication. Gauging credibility becomes the need of the hour as we are in the era of internet and social media. In recent times, the credibility of media came under serious question in view of the ownership patterns of mainstream media and the uncontrolled and unaccountable social media channels. Mainstream media, due to their political affiliations and economic interest, are very choosy in covering the news. An audience is often forced to consult two or three sources to get information covering different facets of the event. In case of social media; the spread of misinformation on social media is highly alarming affecting the credibility. It is surprising sometimes to know that when social media cover an event, then only mainstream media are paying attention. The study affirms and highlights the rate of misinformation spread on the social media is high and needs constant fact checking and regulations and underlines that Mainstream media loses credibility due to slanting, political affiliations and by not informing the public about certain issues. This paper presents a comparative analysis of credibility of mainstream media and social media.

**Keywords: Media Credibility, Mainstream media, social media, misinformation, fake news.**

**0607480 VERGHESE, SNEHA (Department of Communication and Journalism, Osmania University, Hyderabad). THE MEDIUM IS THE MESSAGE: HOW THE WEB SERIES IS A MEANS OF RECLAIMING SPACE AND IDENTITY FOR MILLENNIALS**

This is a theoretical paper that examines the recent phenomenon of high popularity gained among the millennial generation by the “Web-Series”. The Web-series is a string of videos on a common theme or concept, generally fictionalized, available as a set of episodes on the Youtube, Video Streaming Websites (like Netflix) or as part of Web Television, and the reasons for its success.

This paper, based on Marshall McLuhan’s theory, examines how the “Web-series” can be a “medium” that is by itself, “the message” to Generation Y. Through analysis of the reasons for rising popularity and acceptance of the web-series, this research paper concludes that Marshall McLuhan’s landmark idea, that “*The medium is the message*”, is especially true in case of the web series, which has managed to garner a dedicated following among the urban youth— which is addicted to the internet through usage of ‘smart’ devices. Easy access to the internet anywhere, through smart phones, laptops and tablets has fuelled the phenomenon.

It is thus concluded that the medium, in this case, is the web-series itself, which manifests through the internet and/or web-television. The Indian web series is also a tool for reclaiming self-identity for Generation Y, as this generation fails to identify with Generation X’s attachment to soap operas on television or the undue veneration given to Bollywood’s formula movies. It is also the perfect tool for self-expression, as almost all web-series are created by the youth themselves, and represent their angst, their aspirations and life as they know it, thus contributing to its popularity.

**Key Words: Netflix, Web streaming, Video-on-Demand, Web series, Youtube**

## 08. LABOUR IN ORGANIZED AND UNORGANIZED SECTORS

### 0608481 ABHIJEET (Centre for Inner Asian Studies, School of International Studies, Jawaharlal Nehru University, New Delhi-110067). EXAMINING EFFECTS OF FOREIGN DIRECT INVESTMENT ON INDIA FROM A LABOUR

Foreign Direct Investment (FDI) has emerged as a major catalyst of economic development and many countries are opting for different policy instruments to attract FDI. The New Industrial Policy (NPI) announced on July 24, 1991 envisages India's greater integration into global economy. Since then India has also adopted many policies in different sectors and has emerged as a major destination for FDI. FDI plays an important role in the transfer of technologies, which further leads to need of skilled workforce and also creates difference in wages of the workers. The paper which is divided into three parts tries to provide insights on the FDI coming to India since 1991. The first part of the paper introduces the concept of FDI. The second part explains the pattern of FDI in India after 1991 and analyses its impact. The last part analyzes the effect technologies coming due to FDI on Indian economy from labour point of view.

**Keywords:** Foreign direct investment, India, liberalization, globalization, policy.

### 0608482 BHAT, SUNAYANA (School of law, Christ University, Bengaluru). INDIAN LABOUR LAWS AND CHANGING NATURE OF WORK: A CRITICAL ANALYSIS

The Indian Labour Legislations owe its existence to the British Raj. Most of the labour legislations were enacted prior to India's independence. The post-independence enactment of important legislations in the areas of employee security and welfare derive their origin partly from the vision of independent India's leaders and partly from the provisions in the Indian Constitution and international conventions like the International Labour Organization (ILO). The labour legislations were also enacted keeping in mind the international standards on Human Rights and United Nations Protocols. Labour laws are also called employment laws. It can be defined as a collection of laws which control the rights and restrictions or working people and their organizations, workplace health and safety, the standard of employment and industrial relations all are covered under labour laws. Labour law arose due to the demands of workers for better conditions, the right to organize, and the simultaneous demands of employers to restrict the powers of workers in many organizations and to keep labour costs low. The author in this paper will be looking not only into evolution of labour laws but at the same time the change in nature of work of the labourers. Earlier labourers were deprived of their rights at their workplaces, they were paid less for their work and their health issues were not considered. The powers of the workers were restricted. After going through such conditions they raised their voice against it, they demanded more wages and consideration for their health issues, they formed various organizations for this but it failed. They then decided to go on with their strike with unions and raised the voice so that it could reach the government. Finally in 1950 in India labour laws were embedded in the constitution which protected the rights labourers looked after health issued and also assured that they are not humiliated at their workplaces. All this led to the making of the labour laws in India. Every person working should have knowledge about their rights and responsibilities. It is only when the person is allowed to make the correct use of his/ his right the organization can grow.

### 0608483 BHATTACHARYYA, ANATARA and SHELLY, DE (Department of Economics, Jadavpur University). SOCIO-CULTURAL AND ECONOMIC STATUS OF WORKERS OF BHERIES OF EAST KOLKATA WETLAND: A CASE STUDY OF KHANABERIA AND BORO DHAL

East Kolkata Wetland (EKW), included in the Ramsar list of 'Wetlands of International Importance', is the largest sewage fed aquaculture system of the world and the natural sewage treatment plant of Kolkata, where a large number of local people are involved as workers in the sewage fed fisheries or 'bheri'es for their livelihood. Kolkata is the prime metropolis of eastern India, having all modern facilities of livelihood. A significant portion of the fish and vegetables of Kolkata is supplied by EKW.



The objective of the paper is to understand whether the variation in explanatory variables viz. socio-cultural-economic, do explain the wellbeing of the respondents. It also identifies the significant variables that affect the standard of living of the respondents and to form a causality diagram of their livelihood.

Data are collected from primary sources with structured questionnaire administered to the respondents of the two bheries, Khanaberia and Boro Dhal. Data are analyzed by logical derivation and statistical tools. To capture the association between the variables, we have used chi-square, paired T test, correlation and regression. Causality diagram is prepared to justify the cause and effect between different variables.

The study found that there exist a positive association between the satisfaction level of job and income of the workers of Khanaberia and Boro Dhal. It also reveals that there exists a positive uni-directional correlation. However, average satisfaction regarding work place is significantly higher than income at 5% level of significance. It has been observed that different types of jobs performed in the work place create significantly higher satisfaction than income at 3% level of significance. In our findings we have seen that there exists a positively significant correlation with jobs and income. Number of family members has a significantly positive association with income satisfaction. It may be due to the fact that more number of family members is still considered to be the informal income earning source of the family. Even more number of earning members of a family seems to have a positive association with satisfaction regarding communication due to two reasons. Number of earning members makes it possible to finance and bear the transportation cost and to commute to the work place he had to find out possible cheaper way of communication medium. One significant observation has been found out that women participation as fishery-worker is nil.

The EKW, the peri-urban area of Kolkata, is just 6 km from central Kolkata though the workers employed in the *bheries* are deprived of basic amenities of life like education, communication and health. EKW, the kidneys of Kolkata, is the principal source of fish and vegetables for Kolkata. However, reciprocity cannot be found in terms of basic facilities of socio-cultural-economic standard.

**Keywords- Socio-Cultural-Economic Status, Bheries, EKW, Khanaberia, Boro Dhal**

**06080484 CHARLES, MWIRIGI K (School of Law, CHRIST Deemed to be University, Bangalore). THE EMPLOYMENT IMPACT OF CLIMATE CHANGE ADAPTATION IN KENYA: A CRITICAL EVALUATION**

The world we live in is a planet made of up of sensitive ecosystems whereby the productivity and viability of anything in it depends on the health of the environment around it. It is a great world of work but the truth of the matter is that this work is closely connected and interdependent with the natural environment. Therefore, the availability, productivity and security of these jobs/work depends or directly rely on the effective management and sustainability of a healthy ecosystem. Climate change and other forms of environmental degradation have become the greatest cause of net negative impacts on jobs security and creation around the world and especially to the developing countries which their main economic drivers are dependent on agriculture and other allied sectors like wildlife and biodiversity that promote tourism. These negative impacts affects jobs and work productivity, health of the employees or laborers that may end up lowering the employability chances and longevity of one's job tenure. The crux of the matter is that these impacts are expected to become more pronounced in the coming decades especially in a country like Kenya where temperature increase have been on the rise, unpredictable and irregular rains and droughts have been catastrophic. In most part of the country especially the semi-arid areas, the intensity and propensity of heat make heat stress more widespread, thus reducing the total number of working-hours.

In addition, the evils and ills of climate change also have specific implications on women and in particular, for the task of realizing gender equality in the world of work. Differences in social and economic roles and responsibilities exacerbate the vulnerability of women, youths, indigenous and tribal peoples, especially the poor and differently abled people, of whom many of them tend to lack or look deprived of the opportunity to access resources for climate change adaptation and if this becomes the trend, it will be extremely difficult to recover from the effects of this global environmental man made challenge. Employment or Jobs creation and production depends

on the services that the environment provide. Climate change impends and curtails the availability of many of these vibrant and dynamic ecosystem services and thus endangers the jobs that depend on them. The most affected countries by the evils and ills of climate change and especially the impacts they have on jobs are the poor developing countries and most of these countries are located in Africa with high vulnerability and with less adaptive resources and technology. Therefore, availability of jobs to Kenyans and the provision of safe, healthy and decent working conditions rely on the absence of environmental hazards and the maintenance of environmental stability. Therefore, adaptation becomes the most sought measures that can be easily employed to minimize the pains of climate change in Kenya. Adaptation measures can help in the creation of jobs and in the protection of workers and their source of income. Therefore this paper seeks to critically analyze the adaptation measures undertaken by the government of Kenya and other Intergovernmental institutions to alleviate poverty and creation of jobs, prevention of job loss while upholding ecological sustainability.

**0608485 CHOUHAN, KARAN SINGH (School of Law, CHRIST University, Bangalore). INDIAN LABOUR CODE IN THE AGE OF GIG-ECONOMY**

The wheels of Industrial progression always lead to a change, sometimes even radical. The innovation in technology is today changing the way how work is being done. A new concept of gig-economy emerged in recent times, which is based on the information technology, and led to a creation of new class of workforce, fancily named as 'gig-workers'. The 'gig-workers' work for a tech companies like Uber or Zomato etc based on a short term contract or freelancing; however they are not categorized as workmen of that company but only an independent contractor. In such a time when more and more jobs are getting created based on this 'gig-economy', it is important to change the perspective towards the meaning of workmen as to include 'gig-workers' under its ambit. Indian Labour code provides a comprehensive protection to the organized sector workmen; however it should be evaluated against the above development for any shortcoming so that the purpose of labour legislation can get fulfilled, which is to ensure industrial peace and providing protection to the workers. Thus in this paper, author will be looking at whether the current law is sufficient to provide protection to gig-workers or not.

**0608486 GAUTAM, SHIKHA (Jawaharlal Nehru University, New Delhi-110067). CULTURAL SEGREGATION IN FRENCH LABOUR MARKET: CHALLENGES IN ACCOMMODATING SECOND GENERATION MIGRANTS IN THE WORK FORCE**

The European labour market has been clearly dominated by the indigenous population until the Second World War. Afterwards, the colonial legacy and the dire need of manpower to rebuild the European economy have forced the European leaders to pursue the policy of 'open door' towards the 'culturally other' group of people. They have entered into the continent as the engines for the rapid industrialization process however they were expected to leave after the work is done. The present scenario has enough evidences that the expectations have not been fulfilled and they eventually became the part of wider European Society. The settlement of immigrants in the receiving countries of Europe has created socio- cultural, political and economic discomfort among the native population as well as the migrants.

France is one of the European countries among those who have welcomed the people from its colony countries of North Africa (Morocco, Tunisia and Algeria). The migrant population is mainly Muslims popularly known as *Maghrebians* to the French population. It was 1960s to 1980s when the first generations of migrants have come to France as manual workers and they were assimilated into the French society as citizenship was given to them and their families. It was the second generation where the society became more sensitive towards the culturally other groups and it has impacted their education and working scenario effectively.

In this respect, this paper is an attempt to understand the challenges of being the 'out group' in the French society and its impact on their credibility in the labour market. Also the paper will look into the discrimination being practiced by the organizations towards certain groups and their promotion to 'segmented assimilation' in the labour force.

**Key words: Culture; France; Labour Market; Migrants; Assimilation; Challenges.**

**0608487 GOWDA, SANJEEVE G. S (Visveswarapura College of Law, Bengaluru). PLIGHT OF FEMALE WORKERS IN GARMENT INDUSTRIES IN BANGALORE - ISSUES AND CHALLENGES**

India's garment sector is second-largest employer in the country after agriculture. Karnataka's textile industry contributes to 20 percent of the garment production taking place in the country and state is responsible for 8 percent of the national exports in the textile sector. Bangalore city is fast emerging as the techno-savvy structured garment manufacturing center with the tag of IT hub. It is having about 1,200 garment units in the city which employs around 4.5 lakh workers, where 90 per cent workers are women. Almost three-quarters of these are young women from rural backgrounds, often first-generation industrial workers. They are the backbone of an industry that contributes 11% to India's exports, and over 5% to the gross domestic product. Driven by a strong domestic market, the sector has been expanding, and the Union government's Make in India programme has identified garments and textiles as a priority area to encourage investment.

And yet, it needs to be emphasized that the critical issues of women's deprivation spin around questions such as unequal wages, lack of maternity related benefits, discrimination in the workplace, Lack of child care facilities, Health and safety are often neglected, workers are denied breaks, and abuses are common, Sexual harassment etc.,. While there are ILO guidelines as well as national legislation on equal pay for comparable work, these remain unimplemented in many sectors where women are employed in large numbers especially garment industries. Wages and working conditions in Bangalore's rapidly expanding garments export sector, employing a large number of women, remain completely unregulated. Governments and mainstream trade unions have been largely indifferent to this sector.

The Minimum Wages Act, 1948 mandates a revision of wages by state governments every five years. However, workers in the four-decade-old garment industry in Karnataka argue that their wages have been increased only four times in 44 years. Meanwhile, an International Labour Organisation research note last year found that over half the garment sector in India pays less than legal minimum wage, worse than Pakistan, Cambodia, Thailand and Vietnam. Nevertheless each time state governments revise the minimum wage; manufacturers challenge it by asserting that it would make the sector uncompetitive. In Karnataka, garment workers get paid a minimum wage of around ₹. 8,000 a month – 25% below the urban poverty line of ₹.10,800 a month, based on the Rangarajan Committee report. In February 2018, the state government issued a draft notification recommending that all unskilled workers be paid ₹. 11,587 per month as minimum wages; skilled workers, it suggested, should be paid ₹.14, 000. This notification, garment workers argue, was rolled back even before it could become public knowledge.

The present paper attempts to highlight the status of women workers in the garment industries in Bangalore city with objective to examine and evaluate the implementation of labour regulations governing women workers in the country.

**0608488 GOWDA, N. SATHISH (P.G. Department of Studies and Research in Law & University Law College, Bangalore University, Jnanabharathi Campus, Bangalore). JUDICIAL AND ACADEMIC ACTIVISM TO MINIMISE LABOURS HUMAN RIGHTS VIOLATIONS IN INDIA: ISSUES AND CHALLENGES**

Labours whether organised or unorganised around the world regularly suffer violations of their human rights throughout their lives. Everyday workers across the country face discrimination, poverty, violence and abuse in relation to their wages, health issues, insurance, leave facilities, contract labour harassment, compensation, over time, provident fund etc . To overcome all these problems, Indian Parliament has passed various laws and Indian Judiciary has given series of directions from time to time to protect and promote the cause of labours and to remove their disabilities. Within the framework of democratic polity, our laws, developmental policies, plans and programmes are aimed at labours advancement in different spheres. Though there are series of labour related legislation are in place, it is seen that the efficacy of these laws are not satisfactory primarily on account of poor implementation. Further, labours are not participating in the democratic process due to many reasons such as lack of awareness, information and education and many workers do not understand the language of law in a proper manner.

They don't know how to question unreasonable actions of the authorities of State/private entity (such as industries, factories)

Working towards the protection of workers rights ought to be the paramount goal of the country. The judiciary has contributed its share to the promotion of labours cause through some creative interpretive judgments and historic rulings which have either themselves become law or have led to suitable legislation being enacted. Author felt that legal institutions, Professors of Law, Students of Law and Alumni (Academic Activism) have to come forward to take some '*Academic Social Responsibility*' to fight against injustice to assist the labour victims. In this background, this paper discusses the role of Indian judiciary to protect the rights of labours in India by allowing Public Interest Litigation filed by Civil Societies and also examines critically the effects and implementation of judicial verdict by legislature and executive. Further, paper analyses how academic activism with the help of judicial directions and guidelines helps in minimising violation of basic human rights of Labours

**Keywords: Indian Judiciary- Academic Activism- Human Rights of labours- Labour Legislations- -Weaker Sections of Society- Public Interest Litigation - Civil Societies**

**0608489 JANHAVI, S S (Department of Studies in Law, Karnataka State Open University). ISSUES AND CHALLENGES IN ENDING CHILD LABOR IN INDIA**

Accentuation of the problem of child labor throughout the world is a result of globalization. In India child labour is a national tragedy. International organization (such as ILO and UNICEF) along with Child Right Activists, Human Rights Groups and Government are joining hands to eliminate child labour. Extreme difficulty is faced in estimating the number of child labourers in the world. The reasons why children are pushed into working at a very young age are exploitation of poverty, the absence of education and restrictions of traditions. Poverty of cause is the most powerful force driving children to work in hazardous industries. For poor families the small contribution of a child's income of assistance at home makes the difference between hunger and bare sufficiency. Since the causes of child labor are complex and include poverty, economic exploitation, social values and cultural circumstances, solutions must be comprehensive and must involve the widest range of partners in each society. Some specific actions that need to be taken up urgently are as follows: hazardous and exploitative forms of child labour including bonded labor that hampers the child's physical, social, cognitive, emotional and moral development must not be tolerate and government and voluntary organizations must take immediate steps to end them. Constitution of India and Convention on Declaration of the Rights of Child the UN(20th November 1989) makes it obligatory for parents, employers, community and government to respect rights of the child under threat of punishment.

Any number of legal prohibitions would not work so long as the underlying problems of poverty are not addressed. The global convention calls for immediate and effective measures to secure the prohibition and elimination of the worth forms of child labor, as a matter of urgency. According to ILO estimate in developing countries alone about 250 million children aged between 5-14 years are forced to work on paltry wages. Child labor is employed in hazardous industries like glass, chemical, fire-works. Weaker sections become easy targets for recruitment of child labor. Supreme Court held that National child labor laws must accord with the spirit and letter of ILO convention means labour laws allows children to work in the informal sector of the economy, including work on the streets and farms, domestic work or work of the child within his/her own household. Existing law on child labor that allows children to work in occupations that are part of the schedule of occupations that are considered harmful to children contradict the right of every child to free and compulsory education. How can children be at work and at school at the same time? Yet no attempt is made to resolve this contradiction. Therefore, in this paper researcher has made an attempt to analyse the issues in ending child labor in India.

**0608490 JILOVA, C.R (Department of Law, K.U. Kurukshetra). IMPLEMENTATION OF THE LABOUR WELFARE PROVISIONS FOR WOMEN WORKERS IN THE UNORGANISED SECTOR IN INDIA**

The Workers and employers are two pillars of our national economy. The relationship between workers and employers is essential for the building up of national economy. A vast majority of India's labour force is in

unorganized sector. Unorganised sector means that part of the economy where earning one's livelihood is precarious, employment relationship, age and other working condition are defacto not protected or regulated. The unorganised sector as that part of the workforce who have not been able to organize in pursuit of a common objective because of constraints such as (a) casual nature of employment, (b) ignorance and illiteracy, (c) small size of establishments with low capital investment per person employed, (d) scattered nature of establishments and (e) superior strength of the employer operating singly or in combination. The overall picture is one of greater disadvantage for women workers in general and those belonging to unorganized sector in particular. Any discussion regarding the problems associated with the women labour has many aspects, such as economic, political, psychological, sociological and legal etc.

Almost 400 million people (more than 85% of the working population in India) work in unorganized sector and of these about 120 million are women. However, the plight of women in this sector is miserable as they work for extremely low wages, with a total lack of job security and social security benefits, working hours are long and working conditions are unsatisfactory. Women constitute 48.46% of the total population in India and about 25.67% of female population is designated as workers. It is difficult to have separate laws for each employment as this will only result in endless multiplication of laws, and oversight of one or other of the employment. The answer therefore lie in one umbrella legislation that cover whatever is basic and common, and leave room for supplementary legislation or rules which can be made as and where any specific of employment demand for it. The present study is aimed to explore the problems of women workers in the unorganized sector. Further, in this article an attempt has been made to look at the implementation of various labour laws and to deal with the problem of the need to enact necessary legislation to cover women workers in the unorganised sector.

**Keywords: Women Labour, Unorganised Sector, Labour Laws Implementation, Social Welfare Laws, Economy, Relationship.**

**0608491 KAUR, BALWINDER (Department of Law, Hidayatullah National Law University, Naya Raipur, Chhattisgarh). GRATUITY: AS A PROPERTY**

'Gratuity' as its very name implies is something 'gratuitous'. People are not in accord about the status of gratuity whether it is an act of grace or a matter of right. Different people describe differently, it has been considered as a voluntary payment made by the employer to the employee in recognition of continuous, meritorious services and sincere efforts by the employee towards the organization. while some opined that gratuity is a gift, some consider it as a boon or baksheesh given by the employer. Nevertheless, whether or not the employer gratified his employee, by giving the said baksheesh after the employee's dedicated services was a matter of his whims and fancies. On the other hand, the employee had to remain content with whatever his employer would decide and if at all reward for his service. Precisely the employee had no legal claim for the said gift from his employer against his devoted, dedicated, continuous and meritorious service. With the efflux of time, through the legislative, administrative and judicial process, it has become a legitimate right which employee can demand after rendering dedicated, long and unblemished service to the employer for a certain period.

Through the paper, the author tries to elucidate the changing concept of gratuity from gift to property. The author discusses the development of the law of gratuity and for that, the approach of legislature, administration, and judiciary will be dealt with.

**0608492 KHAN, MD. SALAUDDIN (Kabi Sukanta Mahavidyalaya, Hooghly). SOCIO-ECONOMIC CONDITIONS OF AGRICULTURAL LABOURERS IN RURAL AREAS OF BIRBHUM DISTRICT, WEST BENGAL**

The distinguishing feature of rural economy of India has been the growth of agricultural labour in the crop production. The phenomena of underemployment, under-development and surplus population are visible amongst agricultural labourers. The first has its origin in the chronic lack of gainful employment opportunities in rural areas, low and uncertain wages, lack of initiative and entrepreneurial skill and also the age old problem of indebtedness, while the second has its origin in the low status of agricultural labour in the rural hierarchy, the caste system and the

exploitation of the poor by the rich and illiteracy. Further, these workers lack alternative employment due to lack of training and skills. Since they possess no skills or training and then have no alternative employment opportunities either. A study of this problem is important not merely because it involves a largest single group of the Indian population but it is one which brings us face to face with the problems of the millions of the silent and down trodden masses of humanity. India is proverbially one of the poorest countries in the world among Indian poor the agriculture labourers are the poorest. The major objective of this study is to understand the socio-economic condition of agricultural labourers in rural areas of Bankura district, West Bengal. Cross sectional study using random sampling method, total 5560 agricultural, non- agricultural and salaried persons in 55 villages in Bankura district, West Bengal was interviewed. Out of total sample, 1446 were agricultural labourers, 3696 were non-agricultural labourers and 388 were salaried persons. The study was done by a Non-Government Organization, which is registered under Society Registration Act. The survey period was between January 2017 and December 2017. The level of higher education is comparatively low in case of agricultural & non- agricultural sectors compared to regular wage earners. Here p value is significant. Open defecation is higher among agricultural labourers in comparison to non-agricultural & regular wage earners. Regarding use of drinking water, the regular wage earners are in a good position, while due to erratic behavior of monsoon; the use of deep tub well is increasing among agricultural & non -agricultural labourers. Here also p value is highly significant. Again, the number of LPG/Natural Gas users is higher among the regular wage earners because most of them inhabited in semi- urban areas, while wood, dung cakes & straw users are higher among the agricultural daily labourers. The present study is confined to the rural agricultural labourers of Bankura region and ,therefore ,may not be true for other regions of West Bengal or for the rest of the country as there are a lot of variations in the agro climatic conditions and other variables besides policy intervention of different magnitude.

**Key Words: Labourer, employment, training.**

**0608493 KUMAR, GIREESH J (Department of Law, Central University of Kerala). THE CONCEPT OF INDUSTRY, LEGAL AND JUDICIAL DIMENSIONS**

The Industrial Disputes Act is a prominent legislation in the group of Labour Legislations addressing the welfare of the workforce by providing a bunch of safeguards and protective clauses. It provides for different authorities and procedures for the effective functioning of the dispute resolution mechanism with the larger objective of bringing peace and harmony to the industrial world. However, the industrial or non-industrial character of the establishment, the status of workman and nature of the dispute are important points which had undergone great modifications and additions by the judiciary. This paper, mainly focuses on the conceptual clarity of these elements in the light of land mark judicial decisions and the recent Industrial Relations Code.

The paper also analyses the Impact of major judicial decisions in the field by analysing the following landmark cases among others;

**Bangalore Water Supply and Sewerage Board. v. A Rajappa, (AIR 1978 SC 548)**

**Issue:** The question before the 11 judges bench was, whether Bangalore Water Supply and Sewerage Board is an Industry for the purpose of Industrial Disputes Act 1947?

In this case, the court did not confine its scope to answering of the above question only but went beyond that to answer the broader question as to which types of establishments are Industries and which are not.

The Supreme Court by formulating the **Triple Test Doctrine**, held that any establishment whether governmental or private, e.g. Hospital or Educational Institutions, Charitable or Cooperative Societies, profit oriented or service oriented shall come within the purview of the concept of the Industry, if it is satisfying the triple test as. -

- 1- Whether there is a systematic activity.
- 2- Whether there is co-operation between employer and employee
- 3- Whether there is production and/or distribution of goods and services

Eventually, the 11 judge bench had overruled the earlier decisions in the cases such as “**University of Delhi**”, “**Madras Gymkhana**”, “**Cricket Club of India**” and “**Safdarjung Hospital**” and reaffirmed the decision of

**Hospital Mazdur Sabha** case. Considering the suggestion of the court, the parliament has amended the ID Act, 1947 in the year 1982 but the necessary government notification for enforcing the amended definition of industry has not been issued by the government yet.

**General Manager Telecom. v. A Srinivasa Rao, ((1997) 8 SCC 767)**

**Issue:** This is an appeal filed by the Telecom Authority against the judgment of High Court, holding that a Telecom Dept. is an Industry. The main issue was whether Telecom Department is an Industry for the purpose of the ID Act? Supreme Court observed in the light of the Bangalore Water Supply and Sewerage Board case that as per the “Triple Test Doctrine” any establishment can be an Industry, if the test is satisfied, and only departments discharging the sovereign functions of the government are exempted from it. Therefore, in the present case the Court holds that, Telecom Dept. of Govt. is not discharging any sovereign function and hence it is not exempted. The result is that Telecom Dept. is held to be an Industry for the purpose of Industrial Disputes Act, 1947, and thereby the appeal was dismissed.

**State of UP. v. Jai Bir Singh ((2005) 5 SCC 1)**

**Issue:** A five judge bench examines the question, whether government agencies such as **Social Forestry Department, National Remote Sensing Agency**, etc. are Industries for the purpose of the Industrial Disputes Act 1947?

After examining **BWSSB. v. A Rajappa** and some other successive cases, the Supreme Court appraised the argument of the above agencies that not only governmental agencies discharging sovereign functions, but also those engaged in welfare functions of the government shall be exempted from the concept of industry. The court on hearing the argument, upheld that the demands of the agencies are genuine in the changed circumstances, but since it is a smaller bench, it had accepted the decision of **Bangalore Water Supply and Sewerage Board** case recommending that the same is to be reconsidered by a larger bench.

A prognosis on better ensuring of peaceful industrial relations in future also is done in the paper with the following points mainly;

- The Industrial Relations Code shall be equipped with provisions to balance the dictum before and after BWSSB case.
- The judicial process on industrial relations shall consider the change of time to balance the interest of employers, employees and the general public.
- Reconsidering the BWSSB decision by a larger bench shall not be delayed if required but basic idea behind the triple test doctrine shall be respected.

**0608494 MALEY, DEVIDAS G (Department of Post-Graduate Studies and Research in Law, Gulbarga University, Kalaburagi). RECENT REFORMS IN LABOUR LAWS: EMPOWERMENT OF EMPLOYERS VIS-À-VIS IMPOVERISHMENT OF EMPLOYEES**

The recent steps taken by the Union Government to reform and rationalize the labour laws received the attraction and attention of the general public especially the working class. This is because the Union Government since recent past stepped into bringing drastic changes in legislations pertaining to labour in India. The move towards such changes in labour laws by the Union Government created widespread apprehensions in the minds of the working class as the stand of Union Government leaning towards the employer and corporate tycoons. Presently there are 44 Central Government statutes relating to labour in India and supported by more than 100 statutes of State Governments. The 44 Central statutes are subjected to amalgamation into four codes such as the Code on Wages, The Occupational Safety, Health and Working Conditions Code, the Industrial Relations Code and Code on Social Security. The Code on Wages, 2019 amalgamated four statutes such as the Payment of Wages Act, 1936, the Minimum Wages Act, 1948, the Payment of Bonus Act, 1965 and the Equal Remuneration Act, 1976 has already become law passed by both Houses of Parliament and assented by the President of India. The Occupational Safety, Health and Working Conditions Code, 2019 has been introduced in Lok Sabha and referred to the Standing

Committee on Labour. The Code on Occupational Safetymerge 13 central labour laws into a single code which would apply to all establishments employing 10 or more workers. The Industrial Relations Code, 2019 has been introduced in Lok Sabha on 28.11.2019 and pending for the approval of the Lok Sabha. The Bill consolidates essential elements of three laws- the Trade Unions Act, 1926, the Industrial Employment (Standing Orders) Act, 1946 and the Industrial Disputes Act, 1947 helping improve ease of doing business. The Ministry of Labour and Employment has prepared a preliminary draft of Code on Social Security, 2019 by amalgamating, simplifying and rationalizing the relevant provisions of the existing 8 Central Labour Acts is placed for pre-legislative consultative process for consideration in the Ministry.

The Union Government move for reform of labour laws is welcomed by the trade and corporate guilds a good development which creates congenial atmosphere in corporate entities. On the other the trade unions and workers organizations are hectically opposing the move of the Union Government and alleged that in the name of rationalization and simplifications of the labour laws, the Government protecting the interest of the corporate companies and creating hardships and insecurity for the working class.

This paper examines the developments and trends of the reform in labour laws initiated by the Union Government whether balance the interest of the corporate companies and the working class or leans towards corporate companies and harms the working mass.

**Key-words: Labour, Laws, reform, rationalization, simplification, empowerment, impoverishment.**

**0608495 MOKTAN, ANAMIKA AND CHAKRABARTI, SAUMYA (Department of Economics and Politics, Visva-Bharati University, Santiniketan). ANOTHER DUALISM: QUALITY OF EMPLOYMENT IN INDIA**

Despite, a consistently high rate of economic growth in India, quality of employment is not only bad, but is miserable in comparison to many of the SAARC and BRICS countries. This study analyses the quality of employment in India, across rural-urban locations, social-groups and gender– using the crucial dimensions as proposed by International Labour Organisation decent work: ‘employment opportunity’, ‘social security’ and ‘social dialogue’. The analysis is based on individual level (large scale nationally representing) data of Government of India, for the period 2009-10. This paper finds that, although quality of employment in terms of employment opportunity seems to be good, majority are engaged in under remunerative agriculture and non-farm informal sector; and in addition, quality of employment is miserable in terms of coverage of social security and scope for social dialogue. Furthermore, there exists a huge dualism in employment quality across rural-urban areas, social-groups and gender. The paper also finds out that, the individual level factors, such as age, gender, education, religion and social identities play a significant role in employment quality. However, strikingly, the macro –economic and institutional– aspects, such as, economic growth, growth in the organised sector, quality of governance and business regulatory environment, either have no significant role or are negatively influencing quality of employment. A detailed pan-India analysis of multidimensional quality of employment, using (large scale) individual level information across rural-urban, social-groups and gender and finding out both the individual and macro level factors that could influence quality of employment, should add value to the existing literature. Moreover, an attempt to understand the problem of lack of quality of employment in a country like India by using a macro-economic framework could be relevant in the global context where quality of employment is a serious issue especially in the Global South.

**Keywords: decent work, dualism, employment opportunity, social security, social dialogue,**

**0608496 NAIR, ANUPAMA (Divecha Centre for Climate Change, Indian Institute of Science, Bangalore). HEAT STRESS AND VULNERABILITY: A STUDY OF CONSTRUCTION WORKERS IN THE UNORGANISED SECTOR OF DELHI AND GURUGRAM**

India houses over 20 million construction workers, with more than 600 thousand of them in Delhi alone. A sizable proportion of these workers are unskilled or semi-skilled migrants and comprise some of the most exploited



work forces in the country. They are often not paid minimum wages, there is little regulation of their working hours and conditions, their living conditions tend to be very poor with little access to certain basic amenities, and they often do not have access to social security or labour welfare. This is on top of various occupational hazards associated with the construction industry. Heat stress, which is one such hazard, forms the focus of this study.

Exposure to high temperatures is linked to significant health impacts, with evidence of increase in mortality and hospitalisation during the summer season in recent studies in India. Climate change is likely to result in an increase in the frequency of heatwaves occurring over India. Even if the average global temperature rise is restricted to 2°C, the frequency of heatwaves over India is predicted to increase up to 30 times by 2100. State averaged mean temperatures already show an increasing trend in Delhi, fuelled by a changing climate along with the urban heat island effect. Heat deaths in Delhi peak every year in May and June and construction workers, many of whom do not have proper housing and work long hours during the day, are especially vulnerable to the ill-effects of heat stress.

Few studies in India have looked into how heat stress affects the health and livelihoods of construction workers. Out of these, fewer still have examined the various factors that contribute to the vulnerability of this sector of the population to environmental changes such as increasing heat stress. Some of these relations are uncovered in this study, along with suggestions of appropriate reforms in policies and other measures for construction workers' welfare aiming to minimise loss of lives and livelihoods to rising temperatures in the face of a changing climate. The findings in this study are based on detailed interviews with 53 respondents in both cities and a focus group discussion of workers. There is a lot of scope to study how climate change and development are interlinked. This study has looked specifically into labour and climate change, and how the former is vulnerable to one particular impact of the latter.

**Acknowledgements:** This study was undertaken as my dissertation for the M. A. programme in Natural Resources and Governance at the Tata Institute of Social Sciences, Hyderabad. I would like to acknowledge my guide, Dr Arjun Sengupta and my peers at TISS Hyderabad. I would also like to acknowledge my chairperson, Prof S. K. Satheesh, and colleagues at Divecha Centre for Climate Change, for directing my research towards climate change and informing me about this opportunity to present my work.

**0608497** **NEOG, PRIYANKA (Centre for Political Studies, Jawaharlal Nehru University, New Delhi-110067). TEA GARDENS OF ASSAM: AN ARENA OF NON-RECOGNITION, EXPLOITATION AND INJUSTICE**

The paper delves into the issues of injustices and violation of the rights of the tea plantation workers of Assam from the lenses of Nancy Fraser's three dimensions of justice- recognition, redistribution and representation. How the rights of the tea garden labourers are violated generation after generation. Assam contributes to more than 50% of the total tea produced in the country, which makes India the second largest tea producer in the world. But the backbone behind the tea industry is struggling hard to make their two ends meet. The wage of the plantation workers in Assam is the lowest amongst all the tea producing states in India. Various issues like health, education, child labour, malnutrition, sanitation, safe drinking water, maternal and infant mortality rate etc. engulf the tea community at large. The concerns of this section of deprived population need urgent attention. The injustices meted out on them require immediate redressal for them to live an economically self-sufficient, dignified and decent life.

**Key words:** Tea Garden labourers, exploitation, injustice, violation, human rights, emancipation.

**0608498** **PILLAI, ANEESH V (School of Legal Studies, Cochin University of Science and Technology, Kerala). ROLE OF INTERNAL COMPLIANT COMMITTEES AND LOCAL COMPLAINTS COMMITTEES IN DEALING WITH THE RIGHT AGAINST SEXUAL HARASSMENT OF WOMEN AT WORKPLACE**

A secure workplace is a basic human right of women. The General Recommendation of International Convention on the Elimination of All Forms of Discrimination against Women, 1979 emphasises that, 'equality in

employment can be seriously impaired when women are subjected to gender-specific violence, such as sexual harassment in the workplace'. Since India is a party to this Convention, is under an obligation to take all appropriate measures to eliminate sexual harassment in the workplace. Sexual Harassment at workplace was not received much attention in India, till the verdict in Vishaka v. State of Rajasthan. In this case, against the growing social menace of sexual harassment of women at the work place, a three Judge Bench through their innovative judicial law making process declared that, right against sexual harassment at work place is a fundamental right. Due to the absence of an enacted law to provide effective enforcement of the right against sexual harassment at work places, the Supreme Court has also laid down certain guidelines and norms for the observance at all work places and other institutions, until a legislation is enacted for the purpose.

The judgement and guidelines given in Vishaka was considered as an innovative step in the direction of recognising the equal work of female workers and the need for a framework to protect them from sexual harassment. However, even after 15 year of Vishaka judgment the guidelines were remained as symbolic and the central and State Governments were failed to take necessary steps. This fact was revealed in the case of Medha Kotwal Lele v. Union of India and hence the Supreme Court has given several further directions to the State Governments and Union Territories.

In 2013, the Sexual Harassment of Women at Workplace Act was enacted with a view to provide protection against sexual harassment of women at workplace and for the prevention and redressal of complaints of sexual harassment. This Act mandates that, all workplaces in India should ensure a safe and secure working environment which is free from sexual harassment to a female employee. To effectively provide remedy for any violation of right against sexual harassment, the Act mandates establishment of an Internal Complaints Committee at every workplace and Local Complaints Committee at every district. This Act is considered as a significant step forward for the protection of right against sexual harassment at workplace in India. It is to be noted that the success of this Act is depends upon the functioning of Internal Complaints Committee and Local Complaints Committee. Therefore it is necessary that to have a deeper understanding about the functioning of both Internal Complaints Committee and Local Complaints Committee. This paper seeks to examine the various issues concerning the functioning of both Internal Complaints Committee and Local Complaints Committee under the Act.

**0608499 PARVEEN (Law Centre-1, Faculty of Law, University of Delhi, New Delhi). REGULATION OF FIXED TERM EMPLOYMENT CONTRACTS IN INDIA**

After 1990's, the labour law has witnessed major transformation in employment relations. There has been tremendous increase in 'atypical form of employment'. One such form which found greater liking among employers is fixed term employment contracts. Initially, fixed term employment contract was used only to meet temporary and sudden demand for work. But, now, to compete in a globalized world, this form of employment contract is becoming the most common and appropriate thing by the employers. This form, in the opinion of many scholars, is a tool to avoid employer's lawful obligations towards their employees. This paper is a humble attempt to critically analyse the legal regulation of fixed term employment contracts in India. It is directed to find out the loopholes in the existing law. The main focus of this paper will be to find out how far legal regulation of this form of contract takes care of the legitimate demands of the workers. It makes certain suggestions to improve the conditions of workers employed on fixed term employment contracts. This paper is premised on the assumption that fixed term employment contracts should be resorted only on 'justified reasons' and not as an exploitative tool.

**0608500 RAY, ALOK (Nabalia Para Road, Behala, PO-Barisha, Kolkata). SOCIAL SECURITY LAW FOR UNORGANIZED WORKERS IN INDIA: A JURISPRUDENTIAL DILEMMA**

The Constitution of India in its Preamble, Fundamental Rights and Directive Principles has mandated the law and policy makers to establish a modern welfare plural State where every citizen can enjoy socio economic political justice. India is a founder member of United Nations and International Labour Organization. In India, more than 90 % of the total workforce are in unorganized sectors and majority are suffering from poverty, hunger, mal nutrition, disease and lack of minimum social security. They are working in construction, Plantations, manufacturing, service sector, domestic, MGNREGA Scheme, manual scavenging and other areas where caste

related discrimination are still prevailing . We have no reliable data on inter- state migratory workers, sex workers and rag pickers, for whom fair service conditions are still an imagination. We have no national wage policy and unprotected unorganized workforce are facing a merciless common market.

According to new data presented by ILO in the world Social Protection Report 2017/2019, only 45 % of the global population is effectively covered by at least one social benefit and 4 billion people are left unprotected. The scenario in a developing country is worse and more so , when they are unorganized workers.

There are 42-44 Central labour legislations and a plethora of State legislations.However, there is no umbrella social security legislation to cover the entire unorganized workforce. Laws relating to P.F., E.S.I., Compensation, Gratuity are yet to integrate them. Contract labour system is exploitative and principal as well as immediate employer are evasive in its strict compliance. If we examine the case of manual scavenging , it is evident that only enacting laws is not the solution. In 1955, Civil Rights Act prohibited such acts. Subsequently, Employment of Manual Scavengers and Construction of Dry Latrines ( Prohibition ) Act, 1993 and Prohibition of Employment as Manual Scavenger and their Rehabilitation Act, 2013 have been enacted to end this unsung ,deathtrap alike occupation reserved for few marginalized castes . The system is yet to be mechanized and violations are order of the day. In 2003, the Supreme Court in Safai Karmachari Andolan and others Vs Union of India expressed serious concern and directed the Govt. to frame guide lines and to pay reasonable minimum wage and compensation. Every year hundreds are victims of toxic gases and families are not protected by any social security , especially in villages. It is reported that IIT, Madras recently invented a Robot to mechanize the act and now a national project with rehabilitation is required as a part of ongoing Swachh Bharat Mission. In 2008, Unorganized Workers' Social Security Act was enacted but has no impact to improve the scenario.

The Recommendations of 2nd National Commission on Labour suggested that a new and separate umbrella legislation is imperative as the existing laws do not offer protection and welfare to workers in the unorganized sector. The Govt. has decided to rationalize and consolidate the existing legislations in 4 codes and Code on Wages has already been enacted , but how it will cover unorganized workers in its totality is not clear. The proposed code on Social Security should be a comprehensive one with strict compliance.

**0608501 ROHINI, R. S (University Law College and Department of Studies in Law, Bangalore University, Bengaluru). THE CONSTITUTIONAL INTRICACIES IN PRESENT DAY CONTRACT LABOUR IN INDIA**

Contract Labour is a significant and growing form of employment. It is prevalent in almost all industries, in agriculture and allied operations and in service sector. It generally refers to workers engaged through an intermediary and is based on a triangular relationship between the user enterprises, the contractor (including the sub contractor) and the workers. These workers are millions in number and generally belong to the unorganized sector. They have very little bargaining power, have little or no social security and are often engaged in hazardous occupations endangering their health and safety. Keeping in mind the above conditions there seems to be a tussle with regard to the constitutional mandate and the structure of contract labour itself. It is often seen that the desperation of the workforce is always exploited by the middlemen (contractors) in the manner of poor drinking and food facility, shelter and minimum wages. Further the scope is narrowed down to unorganized blue collar jobs who fall prey to such exploitation. As held in Olga Tellis vs Bombay Muncipal Corporation, Right to life and liberty guaranteed under Article 21 of the Constitution means to lead a livable life with right means of sustenance which is clearly not observed in the contract labourer situation.

Therefore, in order to secure the rights and address the welfare of contract labourers, the Government deemed it fit to pass the Contract Labour (Regulation and Abolition) Act 1970. Although the Act has aimed at providing at the welfare of contract workers and preventing their exploitation, there are several issues that cloud a clear understanding of the Act, thus hampering effective implementation.The Act imposes certain duties on the owners of the establishments in the form of providing for basic amenities and needs of the contract workers. This was challenged on several grounds stating that since the workers are only temporary, expenditure of such an extent on them is redundant and therefore should not be mandated. It was contended that such compulsion amounted to

violation of Article 19 (1) (g). However, in the case of *Gammon India Ltd and Ors v. Union of India* it was held that it was the duty of the employer to provide the workers with the basic amenities in order to ensure the health and welfare of the workers. Expenditures incurred in the course of this are tax free and are in no way a form of wastage of money.

On the other hand Abolition of the Contract labour would result in loss of employment, which in turn is violative of Article 19 right to practice any profession for both contractors and the labourer. Therefore, addressing the issues of contract labour through a sustainable method avoiding future industrial unrest is the need of the time and the only remedy to it is by bringing this segment of workers under social security net.

**0608502 ROUT, BAIJAYANTI AND MEHER, BASANTA (Centre for Studies in Economics And Planning, Central University of Gujarat, Gujarat). SOCIO-ECONOMIC CONDITIONS OF DALIT AGRICULTURAL LABOURS: A STUDY OF CENSUS 2001-2011, ACROSS STATES IN INDIA**

This paper is an attempt to show the socio-economic conditions of Dalit agricultural labourers in Odisha. If we see as a whole of India, the dalits has not much explored as compared to adivasis people generally in India but particularly in Odisha. In the last-half-a century, a historical research indicates that landless agricultural labourers formed a significant proportion of the rural population in Ancient and mediaval India. From the period of 2600 BC there was a peasant and agricultural labourer class. The historians generally described the peasant as a producers of surplus, a distinct socio-economic class in India during the agricultural revolution in Indian civilization in the period of 2600-1500 BC. The Aryan people, successors of Indus-culture, after destroying and subjugating the control of people's ownership on their own land, highlighted the stratification of agrarian society. Agricultural production in this period some extent depends on servile landless labour. Irfan Habib said the peasantry deeply divided into landless endogamous communities and rigorously separated from the artisan as well as menial labourers. According to him, the agricultural labourers as a separate class, took place during the first millennium AD. It is a remarkable fact about Indian history that once these castes became established as labouring classes, they remained a durable future, in a fundamental way of the Indian social structure till the recent past.

**0608503 SHANKER, UDAY (Rajiv Gandhi School of Intellectual Property Law, Indian Institute of Technology, Kharapur). DOMESTIC WORKERS IN INDIA- RIGHTS V/S ENTITLEMENTS**

Domestic workers, constitute a large population of workforce in India, has been absent from legal landscape of labour laws of the country. The nature of employment, employer-employee relationship and indeterminate work environment are amongst several factors to deny the statutory benefits to domestic workers. The absence of statutory safeguards makes the workers vulnerable and reasons to exploit them from the hand market forces. The labour market refuses to acknowledge the domestic workers as 'worker' under employment related laws. The government has enunciated policies with an aim to ameliorate the livelihood conditions of domestic workers. The policies, broadly, treat the domestic workers at par with marginalized and poor sections of the society. Though the policies aim to improve the conditions the workers, they fall short of conferring claimable interest upon domestic workers. The absence of a legal right on domestic worker absolve the state from committing to quality of life to them. The welfare-oriented policies have created choice-based implementation mechanism whereas the right-based would obligate the state to commit to the legal rights independent of conditionalities such as resources, political will or bargaining capacity of the workers. The paper unravels the definitional content of 'domestic workers' as elucidated in different international and national literature. It elaborates the applicability of existing laws and policies on labour laws in relation to domestic workers. It helps in building the argument that there is a need to make paradigm shift in legal approach from welfare-based to right-based in order to ensure adequate protection to a large constituents of the workforce who are making significant contribution in economic growth of the country. Also, the paper will also analyze the changes made/suggested in the new labour codes aiming to improve the condition of domestic workers. Accordingly, the research will suggest to improve the legal instruments for better living of domestic workers.

**0608504 SHILPA, M. L (Christ University, School of Law, Dharmaram Campus, Hosur Road, Bangalore).  
THE LABOUR STANDARDS FOR FEMALE WORKERS IN INDIA: A HUMAN RIGHTS  
PERSPECTIVE**

Women need law to protect their rights. There is much difference between a want and a need. 'Wants' are the desires which need to be fulfilled looking into the future perspective, but 'need' is the necessary for the present existence without which there is no life. As life is not a bed of roses, women need to work inside out for the betterment of their families. This may not be the same in each case. But, when it comes to the matter of economic condition of the family, it is the woman who works equally to that of men in order to make life economically smoother. The discussion here is with respect to women who works under a contract of employment, which is a cleave of labour law. Labour laws apply to that area of activities where workers are working on a contract for employment. There are many exploitation and discrimination of human rights which are being violated irrespective of categorization. In this perspective, there is a need for the effective implementation of the labour legislations to protect and maintain peace and security. Amidst the labourers, the working condition of women worker is particularly insufferable.

Women workers are being subjected to misuse and discrimination which has led a voice to the emergence of an order of law for assurance and security. It is seen from the multiple special provisions which has been created for the welfare of women at national and international levels that there has been a transparent move towards creating equal pay, equal access to opportunity, maternity benefits and so on, which are modeled after the International Labour Organisation Conventions. The International Labour Organisation in 1919 influenced considerably the activities of the State in the field which effectively regulated the hours of work, health, safety and welfare of women workers and guaranteed equality before law and equal treatment to women workers. Although, there are many labour legislations for the protection and welfare of women workers unfortunately they are in white papers and not in spirit. In reality, there are no proper measures related to health, safety and welfare of women, social security measures, protection of wages and many other concerns. This being the present condition of women, human rights perspective is a far reaching disquiet. Our nation has failed to reap demographic dividends as a consequence of policy paralysis so far as labour reforms on women workers are concerned. Unfortunately, the protective legislations have backfired and proved to be counterproductive in nature. The only way to overcome the issue is to make the work environment safer by implementing effective redressal mechanism. Considering the above said aspects the author in this present paper makes an incisive account of emerging issues and challenges that pose roadblocks for labour reforms with issues related to women workers in India without compromising with that of International Labour Standards.

**0608505 SIL, RANJIT (Department of Law, North East Hill University, Shillong). SOCIAL ECONOMIC  
JUSTICE AND LABOUR RIGHTS, ESPECIALLY OF UNORGANISED LABOURS: AN  
INDIAN LEGAL SCENARIO**

The International Labour Organization (ILO) since its inception in 1919 has been trying to address various issues on labour and their rights with its mission to promote a fairer and more equitable share of wealth which they have generated, and other allied problems putting hurdles towards fulfilling the aspirations for Socio-economic justice for labourers who are not in a position even to bargain their rights.

The most salient characteristic of the global economy over recent years has probably been globalization. So the issue, 'whether contemporary globalization is a source of prosperity or is aggravating inequality and injustice' is still debatable. Globalization today means the internationalization of production, finance, trade, and also migration.

The Decent Work Agenda, an ILO'S initiative which is based on four pillars (employment promotion, social protection, fundamental rights at work and social dialogue),is intended to allow everyone to obtain decent work through the promotion of social dialogue, social protection and employment creation, as well as respect for international labour standards.

The world needs a floor of social rights. This became clear in the beginning of the 1990s with the emergence of a universal market economy, globalization and the information technology revolution. Debate intensified as it became apparent that economic growth did not guarantee social progress. Amongst several means of action by the ILO to promote a floor of social rights, the campaign to promote fundamental principles and rights at work and the universal ratification of the eight ILO Conventions cover these principles and rights. The ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up, adopted in 1998, aims to ensure that social progress goes hand in hand with economic progress and development. It covers four principles and rights:

- Freedom of association and the right to collective bargaining;
- The elimination of forced and compulsory labour;
- The elimination of discrimination in the workplace; and
- The abolition of child labour.

In the Indian system of industrial relations, the State plays a vital role in the regulation of industrial relations as a mediator and adjudicator. Although the labour and management are theoretically free to determine their own relations, in practice due to the ready availability of the state conciliation and adjudication machinery, a meaningful and orderly bargained relationship could not develop even after several decades of independence. There are various labour laws which deal with different labour and industrial issues. The Acts have been enacted with the objective of social and economic justice. They also embody the constitutional spirit contained in various Articles of the Constitution. However, time now demands to evaluate and analyse whether the objects of labour law reforms and multiplicity of labour laws could actually achieve the desired constitutional goals of distributive justice to bridge the gap between haves and have-nots.

The arguments which are on that existing labour laws are less employment friendly and biased towards organised labour force, rather protecting employment more than encouraging employability bifurcated two notions, one that employ supportive logic demanding flexibility in labour markets as required for economic growth and employment generation and on the other, trade unionist view that flexibility in labour market may pave the way for profit maximization at the cost of protection of labour rights. The State as the third party in a tripartite set up is under its constitutional obligation, especially under Directive Principles of State Policies of Part IV of the Constitution to negotiate between the two at the same time minimising its interferences believing the free market economy, has to respond to the requirements of various stake holders in the market.

When we are talking about protection of labour rights which are mostly confined in the organised sector of employment, India is witnessing a steadily growing numbers of unorganised labours, both in organised as well as in unorganised sectors. In this context, the paper would try to analyse some major labour laws to find out the reasons of such phenomena in labour market.

**0608506 SINGH, SNIGDHA AND TEJ, CHARAN (Christ University, Bangalore) CONSTITUTIONALITY OF NON-RECOGNITION OF ECONOMIC VALUE OF A WOMAN'S LABOUR UNDER SURROGACY PROCEDURE**

The debates and issues around rights of women in India are not new and have kept the intellectuals engaged since decades. However, what is new is the intervention of law on account of emerging technologies and its use as a tool to both safeguard and abuse the rights, more importantly reproductive rights of women. One such case is the case of surrogacy in India. Amongst numerous challenges to the surrogacy procedure in India, one such challenge is non-recognition of economic value of labour of woman under surrogacy procedure. This line of approach has been used to protect the interests of the surrogate mothers and arguably prevent exploitation of women for offering their services (carrying a child for commissioning couple) which has been hailed as baby selling.

India gained the reputation of being surrogacy hub on account of lack of legal of legal framework governing surrogacy and availability of cheaper surrogates. In no time, various issues on account of practice of surrogacy came to light through media reports and litigations. The government responded by coming up with ART Bill (which initially permitted commercial surrogacy and later was brought in line with a subsequent Bill, Surrogacy

Regulation Bill which prohibited commercial surrogacy all together. What is ironical is that the women whose very interest was sought to be protected has been given a go ahead to produce children for others under altruistic surrogacy but the labour has been accorded no value whatsoever. In other words, there is non-recognition of economic value of a woman's labour under surrogacy procedure and there is hence in every sense of the way exploitation of women perpetuated.

This write up critically reviews proposed legal framework on surrogacy which by non-recognition of the economic value of a women's labour under surrogacy procedure has created more room for exploitation of women and is not permissible within the canons of constitutionalism in India.

**0608507 SINGH, RUCHI (Tamil Nadu National Law School University, Tiruchchirapalli). INTER- STATE MIGRATION OF LABOURS FROM THE STATE OF BIHAR: A CRITICAL INSIGHT INTO THE LEGAL FRAMEWORK**

The subject of migration draws a scope for interdisciplinary research into the realms of law, sociology and economics. Inter-state migration from Bihar has always gained spotlight due to the fast changing economic trajectory of the State, and therefore I intend to study the migration pattern from the state of Bihar, analysing social, economic and legal angles of implications of the phenomenon. The efficacy of laws and policies in practice in the state has always been questioned and debated.

The prime motivation for this theme for discussion in Social Science Congress came to the investigator from the recent newspaper reports and surveys highlighting the changing trend in migration from Bihar and how there is a major setback in the economy of other states because of unavailability of cheap migrant labours from the state of Bihar. However, the data from Union ministry of Overseas Affairs suggest that Bihar contributes 15% emigrants to Gulf nations, which is more than the states of Tamil Nadu & Kerala. These reports when placed parallel leads to a paradoxical situation and improvises on the failure of the state policy to control the out flux of cheap labour due to non-availability of resources or employment opportunity in the state, though the reduction in the number of inter-state migrants gives a green signal to economic prosperity in the present decade. But the actual fact and figure finding, and an accurate data analysis with cause and effect graph would need research intervention and our proposal aims to solve the paradox.

The above mentioned statement of problem marks the outline for sociological investigation in the area of migrant workers in Bihar. However one undeniable fact in context is that the economic growth of the state has seen an upward sine curve in the last one decade, This economic change of trajectory gives us an assuring though inconclusive inference that the State's impoverished rural populations will reap the efforts of the governmental policies in favour of labour and reduce their migration to other States responding to the change in the dynamics of domestic state economy. The prime question which needs to be addressed is what is the migratory pattern of the migrant labours from Bihar? Are Labour migrants at the receiving ends of social and legal protection regime?

There is no exclusive legislation in India which governs the subject. The internal migrant labours are totally left at the local state policy which is not even formulated or implemented in all the states comprehensively. Certain social securities are extended to them as they are recognised as unorganised workers under the "Unorganised Workers Social Security Act, 2008. Central Government extended labour welfare and social security schemes to them from time to time through this legislation but the states have been asked to form a State Social Security Board for unorganised workers which will be the body performing the functions of recommending the State Government in formulating suitable schemes for different sections of the unorganised sector workers and of monitoring such social welfare schemes as are administered by the State Government. The inter-state migrants are recognised under the scope of the powers of the state board to recommend law making for this special subgroup of unorganised workers. The state of Bihar has an inclusive definition of migrant workers in its state's scheme which is operative from April 2008. The definition includes both inter-state and international migrants as beneficiaries of the scheme. But this scheme does not elaborate upon the generic of these workers, instead contemplates cases of accidents and unnatural deaths and compensation to dependents thereof. As of date the labour resource Department, Government of Bihar shows no other updated exclusive scheme for internal migrants.

## 09. NATION, STATES AND EMERGING CHALLENGES

**0609508 ARJUNE, VAIRAJ AND SINGH, RAJBEER (Centre for Studies in Science Policy, School of Social Sciences–I, Jawaharlal Nehru University, New Delhi-110067). INNOVATION SYSTEMS IN THE CONTEXT OF GLOBALIZATION: IDENTIFYING CHALLENGES FOR DEVELOPING COUNTRIES**

The major concern for many developing countries is contemporary globalisation that serves to enrich the polarisation between the rich and the have-nots. One of the many promises of globalisation was that integration of markets would rapidly diffuse technologies to developing countries. However, with BRICS (Brazil, Russia, India, China and South Africa) thriving towards sustainable development and economic growth, other countries in the global south on the periphery of developing are still struggling to meet the level of technological and developmental capabilities of emerging economies. The advent of new and complex technologies such as ICT, biotechnology, and large infrastructural projects have now forced firms to collaborate in regions where the skills and resources are heavily endowed to stay ahead of the competition. Thus, it has become necessary to understand and trace the flow of knowledge in the present phase of globalisation. The approach used in this paper centres on the different perspective of innovation systems approaches and their changing emphasis with regards to institutions, actors, and geographic space. A country can have multiple innovation systems such as in particular technology or a sector, but interactions occur on a global platform that transcends national and institutional boundaries. As innovation systems are evolving and range from national to global scales, there seems to be the need for a supra-national or international innovation system to explain the factors leading to innovation in the era modern globalisation.

**Keywords: developing countries, globalization, innovation systems, international system, nation**

**0609509 JHA, BINOD KUMAR (Department of Political Science, A. N. Sinha College, Barh, Patna-803213). NATIONALISM AND SUB NATIONALISM IN INDIA**

The emergence of nationalism in India at the all India and at the regional level is a middle class phenomena and subsequent to British annexation. The Indian nationalism was based on pan-Indian cultural homogeneities and an anti-imperialism shared in common, and the regional nationalism was based on the regional cultural homogeneities. These two were inter-twined and dovetailed. During colonial period, the dominant Indian nationalities consolidated their position and after independence took over the state. But this was resisted, when bourgeoisie of regional nationalities ascended to a hegemonic position in their societies. The capitalistic path of development, chosen by Indian states perpetuates uneven development; this pattern of development poses difficult problems especially in a multi-national society where consciousness has a dual aspect. It is in this framework nationalistic and sub-nationalistic politics could be understood.



## 10. NATURAL RESOURCES, BIO-DIVERSITY AND GEOGRAPHIC INFORMATION SYSTEM

### 0610510 ALAM, MIR KHURSHEED; BAGDE, VIKAS RAJENDRA; VYAS, SURBHI AND DASGUPTA, SHYAMASREE (School of Humanities and Social Sciences, Indian Institute of Technology Mandi). ASSESSING HEALTH VULNERABILITY TO CLIMATE CHANGE: A STATE LEVEL ANALYSIS IN INDIA

Climate change (CC) impacts human health through three basic pathways- direct, indirect and socio-economic disruptions and the literature on vulnerability caused by indirect effects (acting through different types of disease-vectors) and the effect of socio-economic disruption is rather sparse. This study is one of the first attempts to assess current-climate health related vulnerability of Indian states/Union Territories (UTs) that is relevant for CC adaptation. Here, 'vulnerability' has been conceptualized as the degree to which a system is susceptible to the impacts of CC, encompassing several biophysical, socio-economic and institutional aspects. Inherent vulnerability of people is likely to increase when they hugely base their livelihood on natural resources. Based on a set of ten common indicators representing vulnerability of the health system, health related vulnerability indices are calculated through linear maxima-minima method of normalization. The method is in line with the modified framework of Risk Assessment proposed in the Fifth Assessment Report of Intergovernmental Panel on Climate Change in 2014. Population density, infant mortality rates, proportion of demographically vulnerable population, incidences vector-borne and water-borne diseases are considered to represent the inherent 'sensitivity' of the health situation. Adaptive capacities are captured through availability of human health resources, public health infrastructure, road density, per capita income and literacy rate. Results revealed low income states including Bihar, Meghalaya, Uttar Pradesh, Dadra and Nagar Haveli, Madhya Pradesh, Odisha, Jharkhand, etc. have very high health related vulnerability. Key drivers appear to be the lack of adaptive capacity reflected in lack of health-related infrastructure. The analysis also found a high negative correlation between health vulnerability and human development profiles of states/UTs. Further, the study identifies an insufficient allocation of public health spending in states with higher health vulnerability. In summary, it supports the hypothesis that poor people with limited access to the essential healthcare services and less resource endowment are more likely to be adversely affected by the damage caused by CC and variability.

### 0610511 BISWAS, SNEHA (CEENR, Institute for Social and Economic Change, Naagarabhaavi, Bengaluru-560072). STRUCTURE AND FUNCTIONS OF SOCIAL-ECOLOGICAL SYSTEMS: A CASE STUDY FROM INDIAN SUNDARBANS

The term social-ecological system (SES) is used to define the interactions or interlinkages between the social system and ecological system of an area. Indian Sundarban which can be considered as an integrated SES, is rich in biodiversity is also home to more than 5 million people. Present study focuses on a micro level analysis of the above mentioned SES. Therefore, four villages (Madhya Gurguria, Debipur, Satjelia and Rangabelia) from the two blocks (Kultali and Gosaba) of Indian Sundarban were selected and primary survey was conducted with the help of suitable questionnaire. Results from the study show that there is high dependency on agricultural, fishing and livestock resources. Dependence on multiple resources for income generation is a norm in the village ecosystem. But this in turn, is increasing the pressure on land and resources. Thus, the paper tries to analyse the resource usage pattern and intensity of resource usage in the micro-level Indian Sundarban SES.

### 0610512 CHANDRAKANTH, M.G; SRIDHAR, KALA S AND SMITHA, K.C (.....). IMPACT OF URBANIZATION ON AGRICULTURE IN INDIA AND CHINA

In this paper, we examine the impact of urbanization on agriculture in India and China. We study various aspects of agriculture such as groundwater depletion, agricultural wages, the extent of conversion of agricultural to non-agricultural land, the production of cash crops (largely targeted at an urban population) vis-a-vis food crops and the disparities in land/real estate values across rural and urban areas, largely a result of urbanization, in the two countries. We find that in both countries, agricultural land has been declining, and production has moved towards

cash crops, away from food crops, as a result of urbanization. Nonetheless, the paper finds that it is a question of urban management rather than urbanization itself that is the problem in both the countries.

**0610513 GHATAK, AMRITA AND PATHAK, JHARNA (Gujarat Institute of Development Research Off S G Highway, Near Gota Crossing, Gota, Ahmedabad). GRAZING RIGHTS AND THE STRUGGLE OF COMMONS: CASES FROM RAJASTHAN AND KARNATAKA**

The verdict on pasture land by the honourable Supreme Court in 2011 has reinforced the age-old discussion on 'commons' with respect to the conflicts and grazing rights in management of pasture land as Common Property Resources (CPRs henceforth) in India. It is often argued that the decentralised collective management of CPRs by their users play role in 'overrating' the 'tragedy of commons' (Berkes, 1989; Wade, 1989; Jodha, 1986; Chopra et al. 1989; Ostrom, 1990, 1999). The earlier studies suggest that local institutional arrangements including customs and social conventions designed to induce cooperative solutions can overcome the collective action problem and help achieve efficiency in the use of such resources particularly in developing countries (Gibbs and Bromley, 1989; Ostrom, 1990). It is important here to note that Hardin's 'tragedy of the commons' often results mainly from institutional failure to control access to resources, and to make and enforce internal decision for collective use within villages. The Institutional failure could be due to both internal and/or external reasons (Dove, 1993).

The literature also suggests that the participatory resource management often suffers from the obstacles emanating from two key alleyways: a) institutional arrangements leading to further marginalisation of certain groups in the society and in this trajectory the voice of women is further diluted, and b) the institutions are often devised in such a way that the cumbersome legal and policy frameworks make it difficult for community to develop the capacity for self-management (Adrian and Lemon, 2001). Therefore, the policy aiming toward successful participatory management of commons requires understanding so as to facilitate local agency wherein policies and legal frameworks are more receptive to local negotiation.

Given this backdrop, this paper discusses the struggle of commons and its bearing with the equity issues in managing and accessing the pasture land in villages of Rajasthan and Karnataka in India. While its substantive focus is on the issues and challenges that the commons faces in those two regions, the paper also explores the informal institutional functioning through which the voice of marginalised section particularly women is diluted despite having legal and political mandates of reservation in ensuring their representations in different committees within the village.

Using information collected through in-depth interviews, case studies and focuses group discussions (FGDs henceforth) conducted in 2019 in at least 20 villages belonging to Ajmer district in Rajasthan and Kolar district in Karnataka the article addresses the negotiations between democratic politics within the larger system of governance, which is compatible with both privatisation and centralisation as conserving strategies. In line with a previous study (Blair, 1996) this paper also observes that the local control in the present democracy is complex 'for where governmental units are the relevant actors, there tends to be more interest in consuming than in conserving or preserving resources at the local level'.

This paper assesses various typologies of benefits and aspects of benefit sharing in governing CPRs and implications thereof. The analysis is based on the argument that community would be able to manage their resources under conditions that provide incentives for their participation, mechanisms for their power sharing as well as building trust among varied caste and class groups. Collaborative governance in CPRs is found demonstrate the potential for a decentralised system of governance but emphasises 'political will' to support or discourage these arrangements. The findings of this study contribute to the growing literature on collaborative governance of CPR in India and elsewhere.

**Key words: Commons, Land, Governance, Common property resources, Rajasthan, Karnataka, Rural**

**0610514 ISLARY, MICHAEL (.....). A CRITIQUE OF THE BIODIVERSITY MANAGEMENT COMMITTEES UNDER BIOLOGICAL DIVERSITY ACT – 2002**

One of the key provisions under Biological Diversity Act – 2002 is to constitute the local bodies as biodiversity management committees (BMCs) in their jurisdiction to promote conservation, sustainable use and documentation of biological diversity among others. However, if we take a cursory look at the functioning of the BMCs, throughout the country, one can see the discrepancies and inconsistencies that defeats the very purpose of the Act. This is not to suggest that there aren't cases, wherein, BMCs haven't played an instrumental role in conserving the biodiversity. In this paper, the author delves on the existing literature on the subject and also provides empirical insights to support the claims made. Of the many lacunae attached with the BMCs, is the lack of clarity over the domain under which BMCs would operate. For instance, BMCs jurisdiction fall over revenue and customary lands which includes reserve forests as well as protected forests (national parks and sanctuaries). However, the reality tells otherwise. Today, if the BMCs have to work, it needs to rework on its provisions and realign its focus on biodiversity conservation and equitable sharing of resources.

**0610515 M A KATAKTALWARE; DEVI, LETHA G; MECH, A; RAVIKIRAN G AND SEJIAN, V (ICAR-NIANP, and \* ICAR-NDRI, SRS, Bengaluru). EFFICIENT WATER USE FOR SUSTAINABLE DAIRY PRODUCTION**

Water is an essential component that is required in largest quantity by livestock. Drinking water provides 60 to 80% of dry and lactating cows' water needs and feed provides the rest of the water needed. Water availability and quality has a direct impact on health and production performance in dairy cattle. Shrinking water resources warrants judicious use of water since low water availability will lead to adverse effect as animal growth and production.

In its broadest sense, water use efficiency is the net return for a unit of water used. Improvement of water use efficiency aims at producing more food, income, better livelihoods and ecosystem services with less water. There is considerable scope for improving water use efficiency of crop, livestock and fisheries at field through to basin scale. Practices used to achieve this include water harvesting, supplemental irrigation, deficit irrigation, precision irrigation techniques and soil–water conservation practices. Practices not directly related to water management impact water productivity because of interactive effects such as those derived from improvements in soil fertility, pest and disease control, crop selection or access to better markets.

However, there are several reasons to be cautious about the scope and ease of achieving water use efficiency gains. Crop water use efficiency is already quite high in highly productive regions, and gains in yield (per unit of land area) do not necessarily translate into gains in water use efficiency. Reuse of water that takes place within an irrigated area or a basin can compensate for the perceived losses at the field-scale in terms of water quantity, though the water quality is likely to be affected. While crop breeding has played an important role in increasing water use efficiency in the past, especially by improving the harvest index, such large gains are not easily foreseen in the future. More importantly, enabling conditions for farmers and water managers are not in place to enhance water use efficiency. Improving water use efficiency will thus require an understanding the biophysical as well as the socioeconomic environments crossing scales between field, farm and basin.

An effort has been made to analyse LWUE in smallholder and commercial production and to formulate for strategies for improving LWUE. Primary data was collected from 75 small and medium sized dairy farms in Kolar and Shimoga district. The water intake by animals through forage and other feed ingredients are more as compared to water intake through drinking water and that used for on farm servicing operations such as cleaning etc. The average direct consumptive water use by small holder system was found to be 97 litres per day and 127 litres per day for commercial dairies. The calculated water use efficiency for small holder system was 0.85 and for commercial dairying it was 1.62. This indicates that the small holder system was more efficient in water use.

To improve LWUE, we need to increase the quality of locally available feed and the way we feed the animal. Such activities may involve selection, intercropping, urea treatment, chopping of coarse residues and other plant-animal management practices.

**0610516 KUMAR, CHARANA AND GUNAGA, SHRIKANT (Karnataka State Open University, Mysore-570006). TROPICAL FRUIT TREES IN FARM LANDS OF WESTERN GHATS OF KARNATAKA AND ASSOCIATED TRADITIONAL KNOWLEDGE WITH SPECIAL REFERENCE TO WILD RELATIVES**

Tropical Fruit Tree (TFT) genetic resources are a subset of agro-ecosystems and natural forests of Western Ghats, one of the world's natural heritage sites. Occurring mainly in home gardens of Western Ghats, TFTs provide livelihood and nutrition benefits to people and contribute to ecosystem services. However, TFT genetic resources are vanishing at an alarming rate. The study aims at assessing the levels of diversity and on-farm conservation of TFTs. More than 55 Tropical Fruit Trees species were recorded from home gardens of Western Ghats, of which 12 were non-native, suggesting a changing pattern of TFTs. Citrus, jack and wild mango and Appe midi mango varieties were the commonmost, while Bilimbi, Tamarind occurred rarely. Single species shade trees of coffee, such as Grewilia, Erithrina, Melia etc. also contribute to the rarity of traditional fruit trees. Along with the diversity of TFTs, associated traditional knowledge were also been documented especially on wild relatives. The detailed traditional knowledge related to Garcinia, wild mango and Jack fruit was done.

**0610517 KUMAR, G. SATHIS AND RAMASWAMY, S (School of Management, Presidency University, Bengaluru-560064). CONSERVATION OF FOREST BIODIVERSITY IN INDIA: SUSTAINABLE POLICY INITIATIVES**

Being the heart and lungs of the world, forests act as parameters of environment and economy. People of every continent incorporate trees and forests into their culture, religion and mythology. Increasing population, industrialization and urbanization have taken their toll on some of the earth's forest cover and placed the rest in jeopardy. Thus, the world has been continuously anxious with depletion of forest resources and livelihood concerns of the human who depends on natural resources, including forest resources. The most important anxiety on forests in India are an account of factors such as deforestation, over-cutting beyond silviculturally permissible limits, unsustainable fuel and fodder extraction, shifting in pattern and practice of cultivation, forest fires, over grazing and diversion of forest lands to non-forestry uses. India has taken policy initiatives and action plans for the promotion and conservation of forestry sector which starts from First Forest Policy of India (1894) and Indian Forest Act (1927) during pre-Independence and Wildlife (Protection) Act (1972), Forest (Conservation) Act (1980) and Environment (Protection) Act (1986). Some of the recent policy initiatives of Government of India (GoI) related to conservation of forest resources (biodiversity) are National Forest Policy (1988), Biodiversity Bill (2000), Wildlife Conservation Strategy and National Biodiversity Strategy (2002), National Environment Policy (2004), Convention on Biological Diversity (2014), National Forest Policy (2018) and so on during post-independence. Further, the National Forestry Policy has also found reflection in the Five-Year Plans (FYPs) of GoI. In this context, the paper highlights the features, achievements and lacunas of major policy initiatives for conservation of forest resources (biodiversity) which are grouped, evaluated and discussed under six categories: (i) legislative and regulatory measures; (ii) policy initiatives; (iii) data and information needs; (iv) forest management; (v) institution and capacity building; and (vi) international cooperation and coordination.

**0610518 LAVANYA, M. AND MUTHUKUMAR, M (Centre for Geoinformatics, Gandhigram Rural Institute, Gandhigram, Dindigul, TamilNadu-624302). MAPPING OF AGRO-ECOLOGICAL REGIONS USING GEOSPATIAL TECHNOLOGIES**

An area of land which is split into smaller units that are having similar characteristics regarding with production level, land suitability and environmental consequences known as Agro-Ecological Zones. The objective of partitioning the regions, as carried out for rural land-use planning, is to divide with similar sets of possibility and necessity for development. Special purpose programmes can then be developed to contribute the most suitable and efficient aid for each region. A systematic approach towards the land use planning will help to improve the

sustainability of good agriculture practice which benefits Rural welfare and its development. Hence, proper delineation of Geographical areas based on different climatic condition and Agro-Ecological Region (AER) is important to provide a consistent and healthier environment for agriculture. Present study delineate the Agro-Ecological Regions in Dindigul District, Tamil Nadu based on different Soil condition, Temperature, Rainfall, Moisture Index and Length of growing period by using the technology of Remote Sensing and Geographical Information System (GIS). To effectively monitor and manage natural resources, Satellite Remote Sensing and GIS are the most efficient techniques which have been serving a newer magnitude. For sustainable development, the approach of mapping Agro-Ecological Regions based on multi-stage character of the comprehensive has been well conceived using Remote Sensing and GIS technology.

**Keywords: Agro-Ecological Regions, Geospatial Technologies, Dindigul district, Tamil Nadu.**

**0610519 LOKESH, G. B (Department of Agricultural Economics, University of Agricultural Science, Raichur-584104). GROUNDWATER RESOURCE MANAGEMENT IN MICRO WATERSHEDS: AN INNOVATIVE APPROACH WITH EMPIRICAL EVIDENCE**

By making local communities stakeholders in managing groundwater resources can ensure better health of aquifers and mitigate the adverse conditions during drought and crop failure. Participatory hydrological monitoring has been a strategy adopted by the project to transform individual groundwater users to water resources literates. Study has adopted the new approach by forming groundwater users groups in each micro-watersheds and their capacity building with advanced and scientific methods in irrigation wells location using GPS and installation of water meters for measuring water extraction, exposure visits crop planning, and waters saving technologies etc.,. The study covers districts of Hyderabad Karnataka region– Koppal, Raichur Yadgir district where, Sujala–III watershed development program is being implemented by the Watershed Development Department, Govt. of Karnataka. Results show that discussions/trainings were created awareness about economic importance of groundwater in terms net returns per acre inch of water, adoption of water saving technology (micro irrigation), crop planning and need of groundwater recharge structures. This is paper demonstrate the use of scientific tools with farmers participation in efficient, equitable and sustainable groundwater management at micro-watershed level for improving livelihood of farmers.

**Key words: Groundwater, Sustainable, Micro Watershed, Management, Irrigation. GPS**

**0610520 MOHAN, M. MONISHA AND MUTHUKUMAR, M (Centre for Geoinformatics, Gandhigram Rural Institute, Gandhigram, Dindigul, Tamil Nadu-624302). IDENTIFICATION OF COASTAL EROSION PRONE ZONES IN PONNANI COASTLINE IN MALAPPURAM DISTRICT, KERALA USING GEOINFORMATION TECHNOLOGY**

The coastal zone is a highly dynamic environment with many physical processes which is tidal inundation, sea level, land subsidence, sea level rise, erosion and sedimentation. This process plays an important role in the shoreline change and coastal landscape development. The coastal erosion played 70 % of the worlds beaches. The coastal erosion due to the backward movement of sands towards the ocean as a result of the wind, tides, waves and the ocean current. Recently, coastal zones are facing coastal erosion changes happing from natural and anthropogenic effect. The erosional process mainly affects the physical environment of the coastal areas. Therefore, the study of coastal erosional changes is important to identify the patterns of erosional changes over time. Nowadays the rapid advanced growth of Geoinformation Technology facilitates the study of coastal erosional changes. This study investigates identification of Coastal Erosion Proze Zones in Ponnani, Malappuram District Coastline using Geoinformatics technology. This study present preliminary result using satellite images from Lansat-5 and Landsat-8 to identify the coastal erosion changes from 1993 to 2019 at Ponnani coastal area in Malappuram District. The identification of erosional changes from satellite image is vital to analyze the erosion along the coastal area. Coastal erosional changes analysis provides essential information to determine the coastal changes trends. This study revealed the Ponnani facing active erosion with fluctuation rates.

**Keywords: - Coastal Erosion Prone Zones, Ponnani Coastline, Malappuram district, Landsat Satellites Imageries and Geoinformation technology**

**0610521 NAMASIVAYAM, Chinnaiya (Department of Environmental Sciences, Bharathiar University, Coimbatore-641046). RECYCLING OF AGRICULTURAL SOLID WASTES FOR THE REMOVAL OF ORGANIC AND INORGANIC POLLUTANTS FROM WASTE WATERS BY ADSORPTION PROCESS**

Industrial growth and associated technical sophistication in the last three decades or so has posed major problems of solid waste disposal. It has become essential either to find suitable ways for the safe disposal of the wastes or to suggest novel uses, considering them as by-products. Otherwise these will remain an accumulated waste, contributing highly to environmental pollution. The choice between recovery of valuable materials from waste and disposal of waste depends mainly on three factors: technology, economics and attitude.

In developing countries like India, industries cannot afford to use conventional wastewater treatment chemicals like alum, ferric chloride, polymer flocculants and coal based activated carbon because they are not cost-effective. Among the treatment methods adsorption seems to be an effective method. An inexpensive and more easily available adsorbent would make the removal of pollutants an economically viable alternative. Agricultural wastes like orange peel, banana pith, coir pith, peanut hull etc. are discarded in the agricultural sector. These wastes contain cellulose and lignin, which act as very good adsorbents. Namasivayam and coworkers have investigated to recycle these agricultural solid wastes as adsorbents with and without chemical modification for the treatment of industrial effluents. Physically and chemically activated carbons derived from coir pith, peanut hull and Jatropha husk; and wastes such as biogas residual slurry, banana pith and orange peel were found to be efficient for the removal of dyes, toxic metal ions and anions from industrial wastewaters. Results of batch mode adsorption studies using the above adsorbents and applications to the treatment of real industry effluents will be presented in this lecture. Kinetics and temperature effects of adsorption will be discussed.

**0610522 PASUPATHUI, S. AND MUTHUKUMAR, M (Centre for Geoinformatics, Gandhigram Rural Institute, Gandhigram, Dindigul, Tamil Nadu-624302). INTERLINKING OF CAUVERY AND VELLAR RIVER USING GEOSPATIAL TECHNOLOGY IN TAMIL NADU, INDIA**

Tamil Nadu is prone to several Natural Disaster such as drought, flood, cyclone, and landslide. An account of its Geoclimatic condition. The most frequent and common disaster are cyclone, drought and flood. So impact of flood and drought in Tamil Nadu can be reduced by interlinking rivers, which transfer excess of flood water to deficient or drought prone areas. The Geospatial Technologies provide suitable solution for linking of perennial and water deficient rivers of nearby states. In addition with it SRTM DEM and AWiFS dataset incorporate with Land use/Land cover, Geomorphology, Soil and Rain fall are use to identify the potential routes in Geospatial range for interlinking of the Cauvery and Vellar river in Tamil Nadu. The common drought prone areas in between these two river systems are Perambalur, Trichy and Ariyalur. To derive better link route map a similar grid has to generate in all the thematic layers. The implement of canal has to focus on transform surplus water to drought prone areas for. Solving the problem like water scarcity, utilisation of flood water in irrigation propose and also increasing recharge of groundwater.

**Keywords: - Interlinking of rivers, Geospatial Technology, Cauvery River, Vellar River.**

**0610523 PATIL, PARASHRAM JAKAPPA (Centre for Ecological Economics and Natural Resources, Institute for Social and Economic Change, Bengaluru-560072). FOREST ACCOUNTING**

This research is focused primarily on recognizing invisible forest ecosystem services and its contribution to the economy. Forest is just not stock of trees rather it is a base for land, water, animals, oxygen, food chain, etc. It is a life support system. These all services are invisible in terms of economic value. However, ecosystem services have strong monetary value. It is playing very significant role in an economic development. Yet it is not recognized and has not been assigned its economic value. Therefore, it is inevitable to identify and recognize such services and find

out its economic value which it contributes to the Gross Domestic Product. Present research explores forest accounting of Kolhapur district. It tries to reorient invisible ecosystem services accounting and its contribution towards economic development. It discusses about forest accounting theory and its concepts, forest accounting parameters, forest accounting and biodiversity, forest accounting challenges and sustainability, etc. It is a theoretical and practical analysis of entire forest accounting system with focus on serious research investigation.

**Key Words: Forest Accounting, Ecosystem Services, Economics, Diversity, Sustainability.**

**0610524 PERIYASAMY, P (Department of Economics, Kristu Jayanti College, K.Narayanapura, Kothanur, Bengaluru-560077). ECONOMIC VALUATION OF ENVIRONMENTAL DEGRADATION: A CASE STUDY OF SAGO INDUSTRIAL POLLUTION IN TAMIL NADU**

The present study is focused on economic valuation of environmental degradation due to sago industrial pollution in Tamil Nadu. Primary data were collected from 413 households and a greater number of processing sago industries identified villages covered by taluks, namely Salem, Mallur, Attur, Gangavalli and Panamarathupatti would be considered as sample frame by adopted stratified random sampling technique. Primary data have matched with the sago industrial pollution to estimate environmental degradation of water quality, human health impacts, loss of agriculture production, livestock populations in the study area. The present study broadly aims at valuing negative impact on sago industrial pollution based an individual perception of environmental degradation. This outcome of the study has suggested to improve the environmental quality and control the sago effluents.

**0610525 PUNEETH (.....). SPATIO-TEMPORAL ASSESSMENT OF AGRO-ECOSYSTEMS USING REMOTE SENSING AND GIS**

Agroforestry combines agriculture and forestry technologies to create diverse, profitable, and sustainable land-use Systems. Cultivation and conservation of trees in agricultural practices, is an important climate and agro-ecology smart solution with many other co-benefits. Monitoring and assessing the status of trees in the agricultural practices is a key requirement for the sustainable and effective management of the resources. Remote sensing and Geo spatial Technology tools provides wide range of mapping of natural resources from local scale to global scale. Classifying and mapping vegetation is an important tool and mapping of land use and land cover change in the regional scale will provide essential hypothesis in landscape feature change based on human activity. It would give robust evidence of its' negative or positive effect on the climate, ecosystem, natural hazards and socioeconomic dynamics and their relations can be established.

In this study, an attempt has been made to conduct three types of assessments in a transect located in a rural-urban interface of northern Bengaluru dominated by agroecosystem. Land use land cover change of the transect has been assessed for three decades which reveals the pattern of change in agricultural land. For this purpose, firstly to investigate decadal LULC change has been analysed where supervised classification technique is applied to Landsat TM and Landsat ETM+ (path 144, row 51). NDVI & SAVI techniques were performed for the same satellite images to find the decadal change in the biomass cover. By conducting field visits the physical characteristics of the vegetation in the agriculture fields (other than crops) were observed. Same characteristics are used to design an algorithm to map or delineate the field margin vegetation which is a significant component of agroecosystem using Worldview 3 satellite image. The LULC change pattern the severe increase in the built up and plantation (11.96% & 9.27% respectively). Agriculture, water body and barren land (-10.58%, -1.84%, -8.81% respectively) showing decrease trend. The results of field margin tree assessment showed that the vegetation around the farm land covers 7.49% of total agricultural land. The dynamic rural-urban interface is having immense impacts on the agroecosystem of the study area which needs to understood by analysing the sub-components of the system and drivers of change to facilitate sustainable management of agroecosystem.

**0610526 SAHU, HIMANSHU SHEKHAR AND MUTHUKUMAR, M (Centre for Geoinformatics, Gandhigram Rural Institute, Gandhigram, Dindigul, Tamilnadu-624302). GIS BASED BASIN MORPHOMETRIC ANALYSIS OF THE CAUVERY WATERSHED**

Cauvery is the third largest river in south India flowing through the states of Karnataka, Tamil Nadu, Kerala and an Union Territory of Puducherry. The estimated Cauvery basin is about 81,155 Sq. km, originated in Talakaveri of Kodagu district, Karnataka. The elevation of Talakaveri in Westernghat is about 1276m and it flows 800Km in southeast direction until it reaches Bay of Bengal at Poompuhar, Tamil Nadu. The Geological history of Cauvery basin began with the drifting of Gondwana fragments (Indian plate got away from the Antarctica and Australia plate) in Late Jurassic or Early Cretaceous. The Cauvery Basin is an Intra-cratonic rift basin, initial rifting gave rise to the NE-SW horst and graben feature which follows further drifting and rotation caused the development of NW-SE faults. Ever since the formation the basin and river course path subjected to considerable modification during subsequent years. So, the analysis of the inter-relationship among basin parameters aid in understanding of basin slope, landscape, terrain characteristics, groundwater potential of the watershed region. Drainage network can be depict using Remote Sensing data False Colour Composite (FCC) of IIRS 1D (LISS III) combine with the survey of India toposheets and Morphometric analysis can be done by using ArcGIS software. The relationship among Linear aspect, relief aspect and aerial aspects of the basin can be interpreted using the Geology, Geomorphology and Tectonism activity of the basin.

**Key word: Cauvery watershed, Morphometric Analysis, Remote Sensing, GIS.**

**0610527 SANYAL, KRITISHNU AND DASGUPTA, SHYAMASREE (School of Humanities and Social Sciences, Indian Institute of Technology Mandi, Himachal Pradesh-175005). A NARRATIVE ANALYSIS OF FOREST OWNERSHIP PERCEPTIONS AND ITS IMPACT ON PARTICIPATION IN FOREST MANAGEMENT: A CASE STUDY OF GADDI COMMUNITY IN HIMACHAL PRADESH**

Out of the four ecosystem services provided by the forest, „provisioning“ is most discussed in the literature, followed by „habitat services and ecosystem functions“ and „regulating“ services. While the emphasis remains on economic valuation, the role of „cultural services“ that plays an important role in shaping the ecological identity, is rather unexplored. This paper explores the impact of cultural aspect on perceiving forest as a natural resource and extraction and use of forest products by the Gaddi community (seasonal migratory scheduled tribes) in Kugati, a remote, forest neighbouring village in Chamba district, Himachal Pradesh. Quantitative and qualitative data have been collected through structured interviews of 20 households and interaction with 33 other individuals in the village. An in-depth analysis of the qualitative data reveals the following: First, the respondents strongly believes in the need-based extraction of forest resources with a sense of integrity with the forest-land: “One can’t be a thief in his/her own house” - is how Gaddis perceive their right to extract forest product not leading to overexploitation. Mutual trust runs the system smooth without requirement of any local regulatory body or rule. It has been observed that resource extraction was independent of economic status or caste. Second, not only the tangible provisioning services, but people are also well aware of „habitat services and ecosystem functions“ and „cultural services“. However, „regulating services“ are less acknowledged. Third, community’s perception of forest as a resource-base is often different from the policy viewpoint that considers this forest as a protected property, owned by particular stakeholder(s), requiring restricted use and entry by them and all. As a result, existing practice of top down policy making has distanced the community from regulatory authorities leading to an overall reluctance towards the existing management mechanism.

**0610528 SEENIVASAN, R (Department of Mathematical Economics, School of Economics, M.K.University, Madurai-625021). A EARLY SUCCESSIONAL FOREST MANAGEMENT FOR BIODIVERSITY CONSERVATION ON PRIVATE LANDS AS A COUPLED HUMAN AND NATURAL SYSTEM**

Facilitating voluntary conservation on private lands is a crucial element of policies that seek to mitigate forest habitat loss and fragmentation around the world. Previous research emphasizes the role of social factors (e.g., landowner characteristics, economics) in forest management, but environmental outcomes of past management can also affect landowner decisions. Our objective was to evaluate how positive outcomes for wildlife and habitat might reinforce or amplify landowner efforts to manage forest habitats. Conservation science addresses the complementary goals of preventing future biodiversity loss while sustaining critical human foundations. In this paper we use two case studies focused on land management to discuss how private lands conservation can be more effective by



considering how planning and decision making reflects a coupled human and natural system (CHANS). The first case study focuses on conservation easements in the temperate forests of eastern United States; the second focuses on conservation opportunities in Midwestern agro ecosystems, in particular the value of agro forestry. For each case study we discuss the natural and human subsystems, how elements and interactions within and between subsystems (as organized by elements of CHANS) create challenges and opportunities for conservation, and the importance of considering relevant scales of subsystems. Review of these case studies demonstrates that additional insight gained by using a CHANS perspective, particularly given how the subsystems interact at different scales, improves identification of important points of social and ecological overlap, ultimately enhancing conservation research, planning, and practice. Our findings give insight into how private landowners respond to environmental effects of forest management. We conclude that positive environmental outcomes of these conservation programs are related to continued early successional forest conservation by private landowners.

**Key Words: Habitat Conservation, Persistence, Private landowners, Wildlife, Early Successional Forest Agriculture, Avian; Blue Ridge, Conservation Easements, Midwest; Piedmont, Scale.**

**0610529 SHUKLA, AMITABH (Rani Durgabati University, Jabbalpur-482001). A STUDY OF CONNECTION BETWEEN POVERTY CLIMATE CHANGE AND ROLE OF GOVERNANCE**

This paper endeavours to study poverty-climate change nexus and role of governance in managing the climatic conditions for the broader welfare of human being, as it has become abundantly clear that climate change is not only our greatest environmental issue, it may be our greatest human rights issue.

The World Bank now estimates that as many as 2 billion people will lack sufficient drinking water by mid-century as a result of climate change, with 100-400 million people experiencing severe poverty. A new report by GCCA and Realizing Rights delves into the interconnection between poverty and climate change.

However, the impacts of climate change on the poor will be context-specific, reflecting factors such as geographic location; economic, social, and cultural characteristics; prioritization and concerns of individuals, households, and social groups; as well as institutional and political constraints.

**0610530 VARKEY, AMRUTHA MARY AND MANASI, S (Institute for Social and Economic Change, Bengaluru-560072). STRUCTURAL BREAKS IN THE LAND USE AND LAND COVER PATTERN: A GIS BASED ANALYSIS OF BENGALURU PERI-URBAN**

The direct implication of peri-urban and sprawl is the change in land use and land cover of the region. The land use change is a dynamic process ,as it involves rapid spatial and temporal pattern change. This is an empirical study on structural changes in the peri –urban interface of Bengaluru. A structural break in the lulc pattern is observed in 2010 in Hoskote taluk. It shows a structural transition in the lulc pattern . Most of the farm land is transformed into built up , barren land in Hoskote has been converted as industrial clusters. The study analyses the structural breaks in the lulc pattern and what determines the structural breaks and how the lulc pattern differs before and after the structural break. The study focuses on the trends in the lulc pattern in Hoskote Taluk from 2000 to 2017. A significant structural break in three land covers is observed in the year 2010 because of the significant increase in the industrial, residential and commercial land uses. These findings have implication on the city planning in the context of changing peri-urban environment.

**Keywords: Structural breaks, Peri-Urban ,lulc ,chow test**

## 11. PATENT LAWS AND INTELLECTUAL PROPERTY RIGHTS

### 0611531 ARCHANA, K (Karnataka State Law University, Law School, Navanagar, Hubballi-580009). SUSTAINABILITY OF BIODIVERSITY CONSERVATION IN THE ERA OF IPR PROTECTION IN INDIA

Biodiversity is one of the vital issues that affect the survival of the mankind, whose livelihoods depend on the life forms and the ecology. By realizing the significance of biodiversity and the consequences of loss of biodiversity, several national and international initiatives were undertaken in the past. However, none of these enactments could reduce the rapid rate of biodiversity extinction, because of the half hearted attempts made to conserve the biodiversity and the focus on the economic development of the country. In the recent days, intellectual property rights protection is one of the means to achieve economic prosperity of the countries. Hence, the TRIPs Agreement emphasised IPR protection and expanded its horizons to include IPR protection to bio-resources, especially new plant varieties. While framing the Convention on Biological Diversity, the draftsmen carefully framed its objectives to include sustainable utility of the resources and access to benefit sharing by allowing the countries to use the bio-resources of other countries, along with the main objective of biodiversity conservation. However, the Act enacted to conserve wide variety of biodiversity, focused more on the mechanism of access to benefit sharing and procedure to be adopted for research, applying for patent based on bio-resources. As the Act is not the umbrella legislation in conserving the biodiversity, other legislations like Seeds Act, Protection of Plant Varieties and Farmers Rights Act etc., have their share in influencing the biodiversity conservation. Such over emphasis of IPR protection has serious implications on the biodiversity and it may directly impact on the sustenance of diversified flora and fauna, both wild and domesticated. In this background, the present paper critically analyses the difficulties in implementing conservation strategies in the light of IPR protection to bio-resources. It further analyses the meaning of sustainable use and development concept mentioned under the Biodiversity Act, 2002 and also explores the grey areas of the Act, which affect biodiversity conservation in India.

**Key Words: Convention on Biological Diversity, Biodiversity Act, 2002, TRIPs Agreement, Plant variety Protection and IPR**

### 0611532 MEENA, MANOJ AND MEENA, JIGYASA (Department of Law, University of Rajasthan, Jaipur-302004). PROTECTION OF TRADITIONAL CULTURAL EXPRESSIONS UNDER INTELLECTUAL PROPERTY REGIME IN INDIA: A STUDY OF TRIBAL FOLKLORES IN RAJASTHAN

According to World Intellectual Property Organisation (WIPO), the Traditional cultural expressions (TCEs) include music, dance, art, designs, names, signs and symbols, performances, ceremonies, architectural forms, handicrafts and narratives, or many other artistic or cultural expressions. The expressions of folklore are an integral part of the cultural and social identities of indigenous and tribal communities.

The constitution of India identifies the indigenous peoples as “tribes”. India’s tribal communities are extremely rich source of cultural expressions and folklore, contributing to India’s distinct cultural identity in the form of crafts, languages, rituals, health practices, customs, handicrafts, textiles, songs, hymns, religious practices, art, architectural designs, recipes, etc. They emerge from the daily life of a community and are shaped by the environment in which the community lives. Rajasthan is among the leading states in India in terms of tribal cultural expressions including folklore. It is the largest state in terms of geographical area and a home of major tribal communities including *Bhils, Minas, Gadiya Lohars, Garasias, Sahariyas, etc.*

The TCEs and folklore constitute heritage as well as culture. The protection of TCEs is essential for the preservation of cultural heritage, social identity and economic development of the indigenous and tribal communities in India. Protecting folklore contributes to economic development, encourages cultural diversity and helps preserve cultural heritage.

This paper reviews the issues concerning the protection of folklore through the intellectual property legal system, then explores two main issues in the protection of Tribal folklore. The first issue is the influence of traditional tribal culture on the Indian intellectual property regime and Indian society. The second concerns the deficiencies of the Indian intellectual property regime with regard to protection of tribal folklore. The paper also reviews the existing IP Law instruments at International level for protection of tribal folklores. After analyzing these issues, the work proposes a model law specifically for the tribal folklores and also provides suggestions for how the current intellectual property regime could establish a comprehensive legal protection system for tribal folklore.

**0611533 JYOTHILAKSHMI, R (Department of Mechanical Engineering, M. S. Ramaiah Institute of Technology, Bangalore-560054). INNOVATION AND INTELLECTUAL PROPERTY LAW- AN OVERVIEW**

The present study provides an overview of the various laws dealing with innovation and intellectual property rights scenario in India. The many facets of Intellectual rights are dealt with in particular legislations enacted by the parliament in India. These legislations operate on the basis of guarantee of the right to property provided by the Indian Constitution. The law framework along with providing insight into patents, Copyrights, trademarks, designs and remedies for violation of these rights in practice, also covers questions relating to the intersection of these rights in practice. This article also refers to seminal judicial decisions on these areas of law.

**Keywords: Innovation and intellectual property rights, TRIPS, IPR, Indian Law, Copyright Law, Moral rights, Trade Marks**

## 12. PEASANTS, LIVELIHOOD AND LAND USE

**0612534 ANIRUDHAN, S; SUNDARARAJAN, M; REJITH, R G; PRASANNA, M. AND ALEX, P. M (Department of Geology, University of Kerala, Kariavattom, Thiruvananthapuram-695034). IMPACT OF CLIMATE CHANGE AND SEA LEVEL RISE ON THE LIVELIHOOD OF THE COASTAL COMMUNITY OF KERALA**

Coastal structures all over the world are under vulnerable existence because of global warming and climate change. Impact of sea level rise on coastal land on any part is highly variable depending upon the lithological and geomorphologic make-up of the coastal land.

Present study provides a review on the influence of climate change in sea level change and the cause of extreme events in the state of Kerala. As the salinity migration fingerprint and water budget of the region will be altered, it will affect the livelihood of the local population in more ways than one. Majority of the coastal population depend on maritime activities. Most of them are engaged in fishing and income earned from such activities. The western coastal belt is particularly vulnerable, given the comparatively high density of population and the presence a large stretch of low-lying wetlands. Already the land erosion on Alappuzha and Kollam coast has triggered great concern. This aggressive invasion of the sea, portending a sea level rise, will eventually affect the dwellings of the fishermen. They will have to be relocated further inland, increasing the pressures of population. The hypersensitive mangrove ecosystems part and parcel to the coastal belt will be inundated and their regular salinity intrusion rhythm will be disrupted resulting in the waterbodies becoming more saline for more parts of the year. Mangroves and estuaries make the super productive marine nurseries and their disruption will wreak a havoc on the marine life. With increased hydrological pressure from the west, pressure of salinity in the paddy belt of Kuttanad wetland region can prove to be detrimental. With increased sea level the below sea level regions of Kuttanad will become more saline and less productive. At least five major rivers in the state end up in the Vemband lake, flood situations in Kuttanad is likely to be prolonged and deteriorated in the years to come as flood waters and runoff will be trapped in the lake for more periods of time. The mixed crops raised in the region include coconuts, banana, paddy, seasonal vegetables etc. though coconuts are more resilient and can resist increased levels of soil salinity, other crops are very fastidious when it comes to soil salinity.

**Keywords: Global warming, sea level rise, shoreline, Kerala, India**

**0612535 JOSEPH, JOICE K AND BAIJU, K. R (Development Coordinator, M S Swaminathan Research Foundation). SOCIO-ECONOMIC IMPACT OF LANDSLIDES ON THE LIVELIHOOD OF MARGINAL FARMERS IN IDUKKI DISTRICT, KERALA**

The frequency of disasters due to landslides in hilly areas, foothills of mid land and highland are increasing year after year. Landslides affect millions of people worldwide, but theoretical and empirical studies on the impact of landslides on the livelihood of farmers remain scarce, especially in India. Hilly regions of Kerala state experience different types of landslides of which debris flows are the most common. The victims of these mass movements are mainly the marginal farmers in the hilly areas. They mostly depend on agriculture for their daily needs and hence they are forced to stay on the vulnerable area. In this situation a comprehensive socio-economic impact assessment of landslides is very essential for the sustainable development of small and marginal farmers and ensures sustainable livelihoods. This abstract is a nutshell of an ongoing study which aims to elucidate the socio-economic impacts of landslides on the livelihood of marginal farmers from the southern Western Ghats of Kerala state. The study aims to examine four types of resource loss and gains following landslides to the marginal farmers by adopting Hobfoll's conservation of resource stress theory. It is to be done by geological analysis followed by a detailed questionnaire survey in the study area. The four types of resources potentially impacted due to landslides are namely economic loss of the object resources, condition resources loss, loss of personal characteristic resources and the loss of energy resources. The aims and objectives of this research developed from baseline studies, which includes to study the socio economic impact of landslides on the marginal farmers, develop an effective landslide mitigation plan for marginal farmers, develop a people participation approach in the effective management of landslides and related hazards and to study the scope of landslide insurance and permanent resettlement of landslide

affected marginal farmers. Thus the study would be predominantly a socio-economic analysis of mass movements on farmers with the technological inputs of Geology, Pedology and meteorology, providing the natural framework within which the analysis based upon. This study will discuss the causative factors of slope instability in Kerala part of Western Ghats, its impact on marginal farmers livelihoods and spotlights the gaps in landslide research with the view to stimulate a debate to arrive at the way forward. When the effects on community and consequences of landslides are better understood, the government can make more informed decisions about how to provide assistance and relief, adopt landslide prevention steps, mitigation and planning.

**Keywords: Marginal Farmers, Landslides, Livelihood, Western Ghats**

**0612536 PRINCY C P (.....). AN ANTHROPOLOGICAL OVERVIEW OF CHANGING LIVELIHOOD PATTERNS OF KORAGAR: A PVTG OF KERALA.**

Koragas are the distinct primitive tribes inhabited in the northern tip of Kerala and south Cannara District of Karnataka state. Koragar is one of the PVTGs of Kerala. Social and economic status of a community is directly depending on their livelihood patterns. Socio-economic lives of Koragas are more miserable than other PVTGs of Kerala. Hence this presentation paper is concerned about the changing livelihood patterns of Koraga community in Kasaragod district. Traditionally Koragas were slaves, mat makers, cane splitters, agrestic labours in the chronicles of different periods, the Koragas familiar to do diverse kinds of works like basket making, skinning with the use of dead animals, sanitary works etc. But not specializing in any one item alone except basket making. Presently they are engaged with different kinds of wage labouring, basket making, anganwadi workers, ash workers, tribal promoters etc. According to the forest act Koragas are prohibited to enter in the forest areas. So the collection of raw materials for the basketery became difficult. Introduction of various plastic basket products in the market for cheap rate is due for setback in their traditional occupation. Considering these challenges, became the main reasons behind the livelihood changes. The economic sources from the basket making is very less in present periods. Consequently this made a degradation in their socio-economic life. In this changing scenario the present study is strongly relevant. The anthropological research methods applied for the research like interview, group discussion, handicraft visual documentation and participant observation.

**Keywords: livelihood, social status, economic status, basketery.**

### 13. PEOPLES (DALITS, TRIBES, WOMEN, PEASANTS, ETC) STRUGGLES AND MOVEMENTS FOR EQUITABLE DEMOCRATIC SOCIETY

**0613537 BHAUMIK, SUDARSHANA (Block Rasaraj, Mohan Garden, Garia Main Road, Kolkata-700103). LITTLE KNOWN WORLD OF PROTEST AND COMMUNITY CONSCIOUSNESS: ENGAGING POPULAR RELIGION WITH THE POWER STRUCTURE OF CONTEMPORARY BENGAL**

In recent decades the craft of writing the history of South Asian religions has drawn into the fire of identity politics. This has been the case especially in India where at one extreme the religious population of Hindu nationalist and at the other the post modernist theory formations of the Subaltern School both rejected out of hand the validity of critical historical method. In the first case, the Hindu nationalists who have internalised the theories of such modernist scholars as Max Muller and James Frazer concerning the pristine origins and subsequent decay of every religion- assume the truths of Hinduism to be eternal and unchanging and therefore not to subject to historical scrutiny. Secondly the Subaltern School rejects on ideological grounds the validity of the historical enterprise by denying on the premise that the very concept of history is Eurocentric. Religion became crucial in the transformation of the public spheres in British India and in post colonial nation states of India. Many of the leading political parties and social movements mobilize people around religious issues. Social Scientists and historians of India are currently engaged in a debate about the extent to which the present prominence of issues of caste and community in contemporary Indian politics is continuous with pre- colonial past or instead represents a transformation brought about by colonialism. This debate is complicated by the fact that scholars of traditional Indian history and society are also divided about what the relation of religion and politics was in ancient times. In this paper an attempt has been made to discuss the little known world of protest and community consciousness among the subaltern and the lower castes. Further the paper would argue how these marginalized groups are engaging popular religion with their power equation which had been exposed in the contemporary politics of Bengal.

**Key words: subaltern, marginality, indigenous, kartabhajas, matua etc.**

**0613538 CHANDRASHEKHARA H. R (Department of Social Work, Bengaluru Central University, Bengaluru-560001). DEVADASI WOMEN'S STRUGGLE FOR LIBERATION IN KARNATAKA**

Legally and formally prohibited since many years, the practice of dedicating girls to Devadasi system even still survives in south India in big numbers. The latest data available in official figures for the some districts in Karnataka around 46660 and above. The practice of Devadasi, in which a girl is ceremoniously dedicated or married to a temple, continues in several southern states including Andhra Pradesh, Telangana, Tamil Nadu, Kerala and Karnataka. Literally meaning "female servant of god," Devadasis more in numbers belong to the Dalit community. When a girl is dedicated to or married not to a mortal man but to an idol, deity or object of worship or to a temple some rite is performed. This dedication ceremony is more or less similar to the marriage ceremony. The expenses are borne either by the would be companion or urban brothel where these girls would be expected to join their brothel, (Jogan Shankar, 1994). This system of patronage has given way to commercial prostitution in the populated big cities. The Matangi complex could be the link which explains the relationship between the iconographic representation of the goddess, myth and the experience of the contemporary Devadasi (Tarachand, 1992) warped minds in the society encouraged the practice as it would ensure free supply of unattached young maidens. Predatory male also were not long in devising ingenious ways for heightening their pleasures (Uttam Kamble, 1984).

In this paper an attempt has been made to explore the problems of liberation of Devadasi in Karnataka. In Koppal 6035 Devadasis are there in accordings Govt data. Presently Devadasi women's situation is very pathetic, socio-economic and political status are very low compared to others and their children's educational status is very less. This paper has raises the issues to be addressed, implementation of the Devadasi schemes, promoting primary and higher education and creating job opportunity for young Devadasi and Devadasi's children. Some can be resolved legally and other by departments by eradicating the entire system. Devadasi women should continue their voice for their liberation through effective movements at village level to state level.

**Key words: Devadasi, Dedication, Rehabilitation, Liberation, Struggle, Untouchable.**

**0613539 KUMAR, ASHOK (Babasaheb Bhimrao Ambedkar University, Lucknow-226025). DALIT MOVEMENT AND STRUGGLE FOR EQUITABLE AND DEMOCRATIC SOCIETY**

Alienation, torture, atrocities, cruelties, brutalities together constituted the term 'Dalit'. During the 19<sup>th</sup> & 20<sup>th</sup> century the struggle led by the Indian revolutionaries in the course of pre-independence period getting into grips with the outsiders while the country has much menace to look into within itself. The term Dalit means "Broken or Downtrodden" also known as 'Harijans' i.e. children of God, coined by Mahatma Gandhi in 1933. Occupying the lowest rank in the Hindu caste system, they are called *avarna*, those whose place is outside the chaturvarna system.

Umpteen movements have been driven into force by many social reformers like Dr. B.R. Ambedkar, Periyar E.V. Ramasamy and Jyotiba Phule for bringing the dalits on an equal footing to the then called upper classes, mainly Hindus, in the society. Leave the adults for a moment even the children of dalits were born with a fate to not get educated and to take up the menial work performed by their forefathers by ages. The females of the depressed classes or dalits were highly exploited by the men of the rich upper class Hindu families. Dalit women faced verbal, physical and sexual exploitation in private and public places. According to the Tamil-Nadu government official, the raping of Dalit women exposes the hypocrisy of caste system as "no one practices untouchability when it comes to sex." Dalits were not allowed to use common water tanks, were forbidden from entering Hindu temples, were made to live at separate places outside the villages and at some places were made to wear bells to alert upper class of their arrival so that their shadow does not cast upon the upper caste people, made them to break out of such kinds of age-old prejudices. The idea of equality forced them to protest in the form of movements. Albeit some stringent measures have been taken up, the system still bereft in some sphere in bringing the backward classes in an equal arena in the society and this is what leads to the transformation of meek harijans to angry Dalits. Hence, they began to protest with the help of literatures, or forming organization like the Dalit Panthers, which came to be recognized as the Dalit Movement. This paper is an attempt to bring forth the various aspects of Dalit's lives that led to the movement.

**Keywords: Dalits, Depressed, Equality, Exploitation, Protest, Marginalization, Movement.**

**0613540 MONDAL, SAPTAK AND ROY, SOUMYAJYOTI (Jadavpur University). IDENTIFYING THE SOUND OF THE SUB-ALTERNES: LOOKING INTO THE 'OTHER' FACTORS OF THE LALGARH CONTENTION**

The Operation Lalgarh was one of the most embarrassing instances of repressive acts carried out by the State Machinery of West Bengal under regime of Communist Party of India (Marxist), encompassing eighteen police stations of three Maoist affected region of West Midnapur, Bankura and Purulia. Lalgarh comprises Binpur I, some parts of Binpur II, and blocks of West Midnapur and is located sixty kilometres from Midnapur town in West Bengal. The place is majorly inhabited by Santhal Tribals along with people from Scheduled castes and Other Backward Castes, who depend on small land holdings and rain fed agriculture for subsistence. The 'shaal' leaves acquired from the forests are made into plates by the women, which prove to be a major source of income for the community. The region has a long history of negligence by the unperturbed State Government which proved to be a fertile soil for the groundwork of CPI (Maoist). When a landmine explosion, allegedly by the Maoists occurred on the way of the then West Bengal Chief Minister Buddhadev Bhattacharjee, the adivasis got caught up in a three pronged onslaught by the state, the CPI(Marxist) and the Maoists. The following suppression by the repressive State Machinery was so violent that it resulted in a spontaneous resistance by the people.

Marx made an extremely profound statement that the "destruction of the bureaucratic- military state is the pre-condition for every real people's revolution." Lalgarh had witnessed the casuistry and duplicity of the Parliamentary Left, and a total clamping down of the state machinery, which vehemently manifested their dubious take on the people from the marginal stratum of the society and to the caste or class they belong. The report of "Pulishi Santrash Birodhi Janasadharaner Committee" (PSBJC) documented diverse types of nefariousness on the part the "Harmad Vahini" , apparently the alleged CPI(M) cadres, abetted by the Central Reserve Police Force

(CRPF), destroying all constructive endeavours initiated by the PSBJC. And with this, the government sent a strong epistle to the common people of Lalgarh, that they would rumple down any form of dissent and obliterate them essentially. Thus submerging it into a diabolical state of violence and anarchy. With this, comes the disabological dichotomy, involving the question of human and democratic rights, with the vehement killing spree which they engage in, and the ardent anarchy, created a social and political numbness in the region, axiomatically drawing in the State forces. Lalgarh, thus, is a rich political experience embellished by several other nuances and 'other' aspects playing their part rambunctiously but failing to achieve the exposure.

Parliamentary processes failed to circumscribe and address the shortcomings of the particular aspect as it has always been. Knowing that the Indian Parliamentary politics had always failed to address the major internal crisis; acknowledging the immaculate immaturity of the non-parliamentary forces functioning in the region, was the spectacle of bizarre brutality arbitrary and necessary on the part of the opposition? The binary barrage created to hegemonise the oppressed people and completely obliterate the 'other' factors engaging in Lalgarh by the dual endeavours of populist, liberal, corporate media and the ideological State apparatus, is also an ardent non-negligible factor. The paper intends to throw light on these aspects and develop a discursive discourse accordingly.

**0613541 SANNIGRAHI, KRISHNA (Department of English, Savitribai Phule Pune University, Pune-411007). SCIENTIFIC STUDY OF FEMINISM IN THE DEMOCRATIC REPUBLIC OF INDIA**

Liberty, equality and fraternity are the corner stones of any democracy. However, even after so many years of Independence, we neither have actual liberty nor equality in any sphere of life. The social fabric is rife with innumerable discriminations and the most apparent is economic or class discrimination. However, if we further explore the layers of discrimination in our society then we can see that instances of caste and gender discrimination are also present pertinently. The area of the intersection of caste, class and gender is the darkest as these women are the victims of triple subjugation. Even though there are a few examples of women who have tried to get over the discrimination of gender and caste with the help of economic or political power, yet there are innumerable examples of such women, majorly belonging to the lowest rung of the society, struggling to combat these discriminations. Feminism, which has had a socio-political origin, strives to establish equality among all genders. The wave of Indian Feminism was mainly influenced by its Western counterpart and was mainly Brahmanical in nature. The nexus of caste, class and gender did not find space in this discourse leading to the formation of Dalit Feminist groups. However, if we try to categorically study Indian sociological history then we can see that there are instances of innumerable social reformers and thinkers who have immensely contributed in paving the path for equality based on caste, class and gender. Philosophies of some of the pioneer social thinkers like Mahatma Phule and Dr. B. R. Ambedkar who spoke about the need for education, rationality, annihilation of caste and the concept of Dhamma have been instrumental in bringing about emancipation of women. So, the paper would try to explore the history of Feminism in India with reference to the movements and social thinkers who have worked vehemently to bring about women empowerment and trace how feminism has charted its way to the modern times. Primary data in the form of books written by the eminent social thinkers will be referred to and the secondary data from the surveys conducted, interviews and articles on this area will be considered. Prominent libraries will be visited to study the historical records and related data. If real equality has to be attained, be it social, political, economic or gender based, then there should be a change in people's way of thinking. Any kind of social change is not sudden but gradual. Legal and economic empowerment can give women a better footing but in order to bring about a perceivable change in the perception of people, in order to rise above all prejudices, it is important to raise our individual and social consciousness which can be expediated to a great extent by following the principles of Pradnya, Sheel and Karuna.



#### 14. PEOPLES HEALTH AND QUALITY OF LIFE

**0614542 CHATTERJEE, ARNAB AND GHATAK, SANDIP KUMAR (Department of Nutrition, Asansol Girls' College, Asansol-713304). SYSTEMATIC ANALYSIS OF FINANCIAL AND ECONOMIC CRISIS IN PUBLIC HEALTH-NUTRITION**

Malnutrition is one of the major global concerns; irrespective of developed or developing country there is hardly any country which remains unaffected by its consequences. Malnutrition plays the major role in causing ill health which is having enormous economic and human capital costs especially in low middle income countries (LMICs) like India. In spite of remarkable progress in Indian economy still illiteracy, malnutrition, poor hygiene and sanitation are the major constraints of the country. The cause of malnutrition is multifactorial; but importantly a common cause across all forms of malnutrition is a suboptimal diet. Since 2006 international prices of basic food commodities increased steadily, Indian market is not an exception. Higher pricing of the food considered to be the leading cause of lesser dietary diversity among the population. In this context reassessment and reanalysis of the policies regarding the scaling up nutrition through budgetary allocation needs to be assessed for the further formulation of new strategies to combat malnutrition.

The present paper is an analytical paper, based on studies published in PubMed, Google Scholar, Cochrane library, scrutinizing the bibliographies of the relevant articles published in English since 1950. After the first-stage screening of titles and abstracts forty seven studies were sorted, from which thirty two full-text articles were obtained through second-stage screening. Finally, twenty one studies were included in this paper, based on their research question, inclusion criteria and its study design, population, intervention and outcome were considered.

The secondary data analysis showed LMICs especially India where the careful analysis of data sets revealed that in the last decade the rate of reduction of the two key child undernutrition indicators; stunting & wasting are 1 percent point per year, 0.68 percent point per year respectively. These data put a serious question mark in effectiveness of policies taken to address this insurmountable situation. Studies revealed that the rationality of the investment on nutrition intervention or scaling it up to improve the conditions analysed by the different stakeholders across the globe. And a positive correlation was found.

The Global Nutrition Report 2015 suggested investment in nutrition, there is a benefit cost ratio of 16:1 for 40 low and middle-income countries. Even effective investment on establishment of strategies like real time data generation, disaggregation, and proper nutrition programme designing and delivery mechanisms showed tremendous improvement in nutritional status. This paper would conclude with the suggestion that budgetary allocation on proper target oriented nutrition intervention related programme could reduce the intergenerational cycle of undernutrition or would help in the development of policy for achieving the country's vision 2022 "Kuposhan Mukh Bharat".

**Keywords; Nutrition, Budget, Public health**

**0614543 GARG, SHALINI AND AGRAWAL, PUNAM (University School of Management Studies, GGSIPU, Dwarka, New Delhi) A STUDY OF THE EFFECT OF INFORMATION TECHNOLOGY ON WORK LIFE BALANCE AND EMPLOYEE'S HEALTH**

The aim of the study is to examine the status of Work life Balance in the current technological world. The informational technology has become the most important part of the work place. The concept of the "work life balance" is changing rapidly with the current state of information technology. The boundaries between the work and home are dissolving. The arrival of mobile technologies and the portable Wi-Fi system are merging these two world i.e., work and the home. The paper aims to study the effect of telecommuting, e-mail, Flexibility on Work life Balance and the Health of the employees.

The existing literature on the information technology and its effect on health and the work life balance of employees were studied

The findings emphasize the important role of information technology on employee. It was found that the information technology has been successful in making the life of an individual comfortable but it has negative effect on the employee's health and the work life balance. It has blurred the gap between the individual personal life and the work life.

**Keywords: Information Technology, Work –Life Balance, E-mail, telecommuting, health, flexible**

**0614544 GUPTA, ANUSHRUTI (Chacha Nehru Childrens Hospital, Delhi-110031). MENTAL HEALTH OF CWSLD: POLICIES AND PRACTICES**

The condition of mental health has been understood by educational functionaries as mental disability (Psychotic) rather than mental disorder (neurotic). The neurotic conditions such as feelings of anxiety, worry, fear, anger, frustration, envy, jealousy, guilt, depressed mood, and loneliness go untreated. These could be the product of educational experiences such as fears of failure. The fear of failure is so integral to educational processes that it is next to impossible to be eliminated in spite of many reformative examination policies. Secondly the mental health definition has also been changing from one policy to another in India. Thirdly the social stigma attached with the word 'mental' makes it difficult to be diagnosed and treated. Situated in these three contexts, the specific learning disability has fourth disadvantage of being invisible condition. A child with specific learning disability (CwSLD) faces double disadvantage of non identification of disability on account of SLD as well as negative educational experiences. In this paper, policies of the Ministry of Human Resource Development and Ministry of Health are analyzed from the perspective of diagnosis of the SLD condition, provisions made available to achieve educational targets in educational settings. The analysis brings out gaps in percolation of the policy from health sector to education sector. Due to this fragmentation in policies and their implementation a CwSLD is facing mental health issues. The experiences of CwSLD are presented through case studies. The findings reveal that policies and practices are far from being effective both in terms of diagnosis of SLD condition and also for diagnosis of mental health of SLDs. The paper is educative for health and educational functionaries for diagnosis of both the conditions i.e SLD and Mental Health and to provide provisions in educational settings.

**0614545 JASROTIA, AMITHY (Department of Sociology, University of Rajasthan, Jaipur-302007). MENSTRUAL BEHAVIOUR, MANAGEMENT AND PRACTICES AMONG THE ADOLESCENT GIRLS IN EDUCATIONAL INSTITUTIONS: A SOCIOLOGICAL STUDY OF UNIVERSITY MAHARANI COLLEGE, JAIPUR**

The study was done to understand the menstrual behaviour and practices among the adolescent girls of one of the famous colleges of Jaipur city. Literature showed that girls in the educational institutes often face problems during their menstruation due to lack of menstrual knowledge, poor access to sanitary products and non-facilitating institute environments. The present study covered different aspects of menstrual behaviour like hygiene and its management, cultural aspect, perceptions about menstruation, restrictions faced during menstruation and attitude towards it. It also investigated the relationship between cause and effect of the social phenomenon. The respondents of the study were adolescent girls of University Maharani college from the age group of 18-23 years. The age kept in mind so that they could better present perspective on menstruation and can give answers like why it is necessary and how to manage it, what are their perceptions on this and do they follow any kind of restrictions while menstruating?

The sample for the study was 30 girls so that in-depth understanding can be built. The study was purely exploratory in nature. The study conducted with the help of an interview schedule. The study concluded that cultural and social practices regarding menstruation is very much depended on female's education, family-background, socio-economic status, and her cultural and belief system. During field study it has been observed that the handling of the menstruation, as a biological phenomenon, has close relationship with the background of the female individual. Menstruation being normal physiological phenomenon affects every woman but the experiences vary on the basis of region, culture, community as well as from women to women. The knowledge about menstruation and menstrual health care seeking behaviour found to be satisfactory as no severe menstrual problem is associated with any of the respondent being studied. Girls are aware of precautions to be taken while menstruating and prefer doctor's prescribed treatment in severe health conditions. Although girls confirm it as a normal physiological

phenomenon but still there is an urgent need to educate girls and their parents especially mother in order to change myths and misconceptions regarding menstruation and to build a wider view on importance of menstruation so that they can properly manage it in more dignified way.

**0614546 JENA, SASMITA (Jawaharlal Nehru University, New Delhi-110067). DETERMINANTS OF INSTITUTIONAL DELIVERY AMONG RURAL AND URBAN POOR WOMEN IN ODISHA.**

One of the key causes in reducing maternal mortality is access to quality antenatal and natal care. Institutional delivery is a source for reducing maternal mortality and thus improving overall maternal health. Percentage of institutional deliveries is one way to estimate coverage of antenatal and natal care services within a country. These are the main objectives of this study, to analyze the status of institutional delivery among women in rural and urban poor areas of Odisha, to study the determinants of institutional delivery among rural and urban poor women in Odisha and to compare institutional delivery among women in Khordha and Sundargarh district of Odisha. For the present study the data was collected in the rural area (Kesura village) and urban poor area (Saliasahi) of Khordha district. In Sundargarh district rural area (Dolposh village) and urban poor area (Ganjubasti) was selected for the present study. Total 800 women in the age group 15-49, those who have delivered a baby five years before at the time of survey in a household would be selected & interviewed. 200 women interviewed in Kesura village and 200 women interviewed in the Dolposh village. 200 women interviewed in Saliasahi urban poor area and 200 women interviewed in Ganjubasti urban poor area. The study was conducted during 2011-12. The household sample will be drawn through systematic sampling technique. Eight Focus Group Discussions were conducted among working and non-working women in the study area. The data was collected and analyzed by using SPSS. From the study it has been found that women belonging to ST category were less likely to have institutional delivery compared to their counterparts. This was because of illiteracy among ST women. They had less knowledge about the benefits of institutional delivery. From the study, it was found that they had fear of operation and so they were not going to hospitals for institutional delivery. They also believed in their own culture. In the study area, ASHA and Anganwadi workers were facing some difficulty in motivating ST women to go for institutional delivery. Institutional delivery is high among women who had one child compared to those who had more than 3 children. Women from BPL families were going less to hospitals for delivery compared to APL families. Women from lower standard of living had less institutional delivery compared to women from medium and higher standard of living.

In the study area, a majority of the deliveries were being conducted by traditional birth attendants, called midwives. These women are illiterate and follow traditional methods in conducting delivery including unhygienic ways and thus contribute to high infant mortality. The major factor for less institutional delivery among respondents from Kesura, Dolposh, Saliasahi and Ganjubasti was inadequate time to go hospital. In some cases, the problem to reach medical facilities was because of non-availability of transportation and in some cases the absence of husband or other family members. In Kesura, the major two factors that affected institutional delivery were high health expenses and poor services at the hospital. In Saliasahi, some respondents said that their in-laws were not allowing them for institutional delivery and some told that due to fear of operation they were not going to hospitals for delivery.

**0614547 MAJUMDAR, SAIKAT (Department of Health & FW, Public Health Research, Government of West Bengal). HYPERTENSION STATUS OF RURAL POPULATION IN BIRBHUM DISTRICT, WEST BENGAL**

Non-communicable diseases (NCDs) are the leading cause of adult mortality and morbidity globally. Among the NCDs, hypertension is one of the important components which are a major chronic lifestyle disease and most prevalent NCD in India. The increasing trend of hypertension is very soon going to be built up as a colossal problem not only in the urban areas of India but also in the rural areas. The objective of the study was to assess the socioeconomic and behavioural risk factors associated with hypertension among a sample male and female population in rural areas of Birbhum district, West Bengal. 733 adult individuals (311 males and 422 females), aged  $\geq 18$  years, were included in the study in 2 blocks (Suri-1 and Rajnagar). Hypertension was defined as mean systolic blood pressure (SBP)  $\geq 140$  mm Hg or diastolic blood pressure (DBP)  $\geq 90$  mm Hg, or if the subject was undergoing regular antihypertensive therapy. The study was done by a Non-Government Organization, which is registered under

Society Registration Act. Prior permission and ethical approval were obtained before data collection based on a structured pretested questionnaire. BP of each participant was measured using a digital sphygmomanometer (OMRON, Model- HEM-7111) after participants had been sitting quietly for at least 10 min. Three consecutive measurements were taken 5 min apart on the right arm, with the person in a sitting position. The survey period was between the months January to December 2018. It is seen that incidence of hypertensive was higher though the patients were aware regarding hypertensive. We have done the same study among the participants who were hypertensive in 2016. Among them 43.38 % were hypertensive and 47.20 were pre hypertensive and the rest 9.41 % were normal. Among the participants 12.28 % were addicted to alcohol and 25.85% were active smokers. Again among them diabetic prevalence was 9.69 %, 1.77% was suffering from kidney diseases, 4.37 % & 1.77 % were hospitalized due to stroke and myocardial infarction. An elevated level of hypertension exists among a select group of the rural Indian population. Lack of awareness of the disease and very low rate of control of hypertension among those who were treated became the major issues. These findings emphasize the need for dissemination of knowledge about the disease and counseling of the patients during treatment continuation.

**Key Words: Non-communicable, hypertensive, blood pressure.**

**0614548 NAAZ, FALAK; JASMINE, ELIZABETH AND SOANS, SONIA (Indian Institute of Psychology and Research, Bengaluru-560095). LIFE SATISFACTION AMONG TRANSGENDER AND CISGENDER PEOPLE**

The present paper aimed at understanding and highlighting the differences in life satisfaction among transgender and cisgender population. It highlights gender differences in life satisfaction among transmen, transwomen, cisgender males and cisgender females. The paper is based on a study conducted by the author on a sample of 120 unmarried working adults belonging to the age range of 18-60 years. The sample population was divided into 60 transgender people and 60 cisgender people. 30 among this group were transmen, 30 were transwomen; similarly 30 people were cisgender males and 30 cisgender females. Life Satisfaction Scale (LS Scale) by Dr. Promila Singh and George Joseph was used, which measures the life satisfaction of employees with respect to taking pleasure in daily activities, considering life meaningful, holding a positive self image, having a happy and optimistic outlook and feeling success in achieving goals. The data was subjected to descriptive statistical analysis and t test was used to compare if there was any significant difference between the mean scores. Results showed that there is no significant difference in the level of life satisfaction between transgender and cisgender people. Although there is no significant difference, the mean life satisfaction scores were found to be higher for transwomen compared to transmen and higher for cisgender males compared to cisgender females. This seemingly higher life satisfaction of some of the groups highlights the fact that gender identity does influence life satisfaction. It also throws light upon the fact that there is a need for further studies with a bigger group as well as smaller qualitative studies to understand the reasons for differences in life satisfaction.

**Key Words: Cisgender, Cisgender females, Cisgender males, Gender, Gender Identity, Life Satisfaction, Transgender, Transmen, Transwomen**

**0614549 NISARGAPRIYA T S; ELANGO STANISLAUS AND SHILPA (Department of Social Work, Bengaluru Central University, Bengaluru-560001). A STUDY ON THE IMPACT OF HOUSEHOLD FOOD INSECURITY ON NUTRITIONAL STATUS OF DALIT WOMEN IN KARNATAKA**

Malnutrition is major health problems among the Dalit women who aged between 15 to 49 (reproductive age) in Karnataka. Therefore, the present study aimed at knowing the impact of Household food insecurity on nutritional status of Dalit women in Karnataka.

The main objective of the present study was to assess the socio-economic status and its impact on the nutritional status of the Dalits women in Karnataka and also to analyze the impact of food insecurity on the nutritional status of the respondents.

Descriptive research design was adopted, stratified sampling procedure was employed for selecting the revenue regions of Karnataka state such as, Mysore, Kalburgi, Belagavi, and Davanagere, from each division two district were selected, from two districts two taluks were selected, from each taluk 24 malnourished dalit women were selected. Overall 384 respondents were selected as respondents by using purposive sampling technique. Data was collected by using interview schedule using Kavith Gaur's socio-economic scale.

The study found 44.03% of the respondents were belong to the age group of 21 to 25 years. Majority 73.2% of the respondents were unmarried, having higher responsibility in household tasks. It was found that, 34.6% of the respondents were illiterate. 48.7% of the respondents were earning Rs.1000 to 4999 as monthly income. Majority 65.8% of the respondents do not have toilet facility they go for open air -defecation. Majority 62.3% of the respondents were living in overcrowded family. It was resulted that socio-economic status of the respondents is low. Socio-economic status influence the nutritional status of the respondents. It was found that, 51.8% of the respondents suffering from severely malnourished. It was observed that, household food insecurity has significant negative impact on the nutritional status of the respondents. Hence, the social work profession is committed to maximize the wellbeing of individuals and society. The problem of malnutrition among Dalit women can be solved by integrated-programme action implemented at individual, family and community level. Social work interventions through different methods of social work can be clearly envisaged.

**0614550 QUTAB, SHAHANA (School of Management, IILM University, Sector 53, Gurugram, Haryana-122003). TRENDS IN HEALTH INSURANCE ADOPTION BY RURAL POOR POPULATION OF INDIA AND THE SOCIAL INTERVENTIONS – A REVIEW**

The review paper analyses trends in adoption of health insurance and healthcare by the rural poor population of India. Existence of health insurance is a vital step towards achieving universal healthcare and health coverage. Health is a luxury for many in India especially in the far-flung rural regions of the country fraught with poverty. Health is also an important indicator of economic and social development of a nation. Many schemes and initiatives of government, NGOs, civil society and others, for propagation of health for all, are important steps in improving overall health quotient in India. Health insurance is one such initiative that improves the health standards of the people especially those belonging to the poor and marginalised. It limits or removes direct financial burden on healthcare consumers. The present paper was written based on exhaustive review of literature that covered past and present scenario of healthcare and health insurance schemes including Pradhan Mantri Jan Arogya Yojana (PMJAY) also known as Ayushman Bharat Health Insurance Scheme. Prevalent trends that were highlighted in the literature emphasised the fact that health insurance awareness is less among the poor and rural population of India. The service delivery of Healthcare and health insurance is lacking overall. The literature also highlighted that targeted community awareness campaigns with regards to health insurance positively affected the healthcare utilisation of rural population. More significantly, healthcare of females among the rural poor showed positive improvement by adoption of health insurance. To conclude, the review of literature stressed on the importance of health insurance in India for bringing equity in healthcare. Community interventions and awareness campaigns need to be designed and implemented strategically, keeping in mind the needs, beliefs and social behaviours of the targeted community. Improvement of service delivery of social and developmental initiatives in healthcare, especially health insurance, will generate long lasting positive social behaviours, benefitting the community and nation.

**Key words: Healthcare, health insurance, awareness, social behaviours, development communication, PMJAY.**

**0614551 RATH, KRISHNA CHANDRA AND ANSARY, RABIUL (P. G. Department of Geography, Utkal University, Vani Vihar, Bhubaneswar-751004) MAPPING PATTERN OF GEOGRAPHICAL DISTRIBUTION OF HEALTH CARE FACILITIES AND HEALTH OUTCOME IN ODISHA, INDIA: A COMPARATIVE STUDY**

In order to achieve universal health coverage (UHC), the countries have relied on different approaches. States' interventionist healthcare systems have remained more prevalent in most socialist countries. Although, the

state Odisha is considered as one of the poorest and backward state in the EAG region of India but in recent time it achieved rapid improvement in social and human development indicators.

The major objectives of the study are

- I. Mapping and identify regional pattern of health care facilities (physical infrastructures, Man power, equipment,) in Odisha with special focus on study districts.
- II. Mapping and study population health outcome in Odisha with special focus on study districts.
- III. To study relationship between available health care facilities, utilisation and health outcome.

Thus, with this background present study tries to answer the following research questions which are as follow,

NFHS different rounds /Census of India/World Health Indicators/WHO/NSSO and other relevant information to be collected from existing literature.

According to the NFHS-4 (2015-16) report in term of child health indicators the state is performing better than the national average. The Under-five mortality rate of the state is 50 while the national average figure is 51 per 1000 live birth. On the other hand in term of Infant mortality rate, it is lower (40) than the national average (41). No doubts among the EAG States, Chhattisgarh Odisha, and Uttaranchal have performed better in nutritional status of under five year children compared to other major developed states i.e. Gujarat and Maharashtra where per capita income is almost double than Odisha (Ansary and Hooda, 2019). The prevalence rate of stunted children in Odisha is 34.1% which lower than Gujarat (38.3%) and Maharashtra (34.2%). The analysis of nutritional status at the district level indicated malnutrition in some of the agriculturally developed districts (Karnal, Panipat, Sonipat, Rohtak as well as in Gurugram) of Haryana is even higher than the state average of Odisha. The prevalence rate of underweight children in Odisha is also lower than the state Gujarat and Maharashtra. In term of Ante-natal, post-natal care, full immunisation, institutional delivery the state also showed tremendous progress than the national average in between NFHS-3 (2005-06) and NFHS-4 (2015-16). On the other hand in term of health infrastructures (both access point and man power) the state is lagging behind among the states as well as national average. Also there is regional concentration of health care service points. Although, our public health system is three tier system (primary, secondary and tertiary) but primary health services are life line of population serving for more than 90% population. In primary health services Sub-centre, PHCs, CHCs are the major access point for the rural population. The rural health statistics (2016) and district census hand book (2011) reported in Odisha many of the referral point as well as man power serve beyond standard norms prepared by National health bureau. It is also noticed from the literature patient man power ratio as well as patient health care service unit is higher in Odisha than the national average figure. The districts in the south western part of the state lagging behinds in term of available health infrastructures and man power with compare to the coastal Odisha. The study also found positive relationship between health outcome and available health infrastructures and man power and negative between poor road communication and socio-economically backward districts. The study also found there existed differences in health outcomes of the population with different socio-economic and demographic backgrounds.

**0614552 ROY, NIBEDITA (Centre for Social Medicine and Community Health, Jawaharlal Nehru University, New Delhi-110067). UNDERSTANDING QUALITY OF LIFE AMONG THE FEMALE SEX WORKERS IN SONAGACHI, KOLKATA**

The “problem” of sex workers and their health is situated at the nexus of different competing perspectives and moral paradigms that define their health priorities for sex workers in research and policy. Sex workers’ own perspectives are hardly given its due importance in analysing the issue, thus, contributing to research and policy which silences sex workers’ priorities. With the advent of HIV/AIDs epidemic, Sonagachi, the Red Light Area (RLA) of Kolkata, became the first place where the HIV/AIDs intervention started and sustained for more than two decades. It’s to uncover how the intervention has shaped the lives of the sex workers.

While HIV/AIDs among the sex-workers has been identified as a serious occupational health problem for them, there may be other issues related to their overall wellbeing which needs to be explored. With this backdrop, the study attempts to understand the quality of life from the lived experience of the female sex workers (FSW).

While quality of life (QoL) is mostly understood in quantitative terms, little emphasis has been placed on their lived experience. Thus, to address this gap, an attempt has been made in this study. The methodology for the primary field work rested within the qualitative research paradigm. Using chain referral sampling, 30 FSWs and a few other stakeholders are selected as research participants. From the in-depth interviews, personal narrative analysis are done to develop themes.

The findings of the study highlights that despite multiple levels of vulnerability not only in their work, but also in their life; the experience of resilience give interesting insights about their QoL. Further, the argument of present paper revolves around the following determinants of viz., income, wealth and assets; nutrition; employment and livelihood activities; education; access to services and amenities; stigma, agency; dignity and social networks. Thus, it was found that the QoL among the sex workers involve complex interaction of these factors. The study has the potential to contribute in the overall understanding of wellbeing among the vulnerable community.

**0614553 RYMBAI, MOTIKA S AND THANGKHIEW, DARISHISHA. W (North Eastern Hills University, Shillong - 793022). NRHM AND HEALTH SPENDING CONVERGENCE IN NORTH EASTER STATES OF INDIA**

The north eastern region of India comprise of eight states for which seven states fall under small and special category states. The north eastern states consist mainly of rural regions with more than 85 percent of population living in rural areas. This demographic distribution leads to ensure availability and accessibility of healthcare to greater extent. Though, the North Eastern region comparatively does well on many health indicators than most of big Indian states, but its health infrastructure and accessibility is still a grave concern. Therefore the study aims to find the overall efficiency and quality of the health expenditure in the north eastern states and tries to analyse whether the NRHM Act 2005 turn to be instrumental for streamlining the health expenditure of these states or not. The study uses the log linear dummy model to identify the convergence of North Eastern states in terms of health expenditure. The findings of the study turn to be unique and surprising. The study found that except Assam and Manipur the per capita health expenditure of North Eastern states is inelastic. Further, the study found that the North Eastern states does converge post NRHM. The growth of health expenditure for small states of North east turns to be higher than big states after the implication of NRHM.

**Key words: Health expenditure, NRHM, Convergence, Elasticity, North East**

**0614554 SABNA, E S (National Institute of Advanced Studies, IISc campus, Bengluru-560012). ROLE OF SCHOOL IN MENSTRUAL HYGIENE MANAGEMENT: A STUDY IN BANDARSINDARI VILLAGE**

Schools are the agent of creating a pro social environment focussing on equal treatment irrespective of gender (National Curriculum Framework, 2005). Adolescent girls in rural areas find hard to come out of the difficulties of the age which increases with attaining menarche when the community consider them inferior, school is the place which can promote facilitating environment. Their challenges increase in school when there is lack of access to water and privacy to clean oneself due to improper infrastructure and absence of gender sensitive environment. In short, the unfavourable school environment interferes with practicing basic human rights in managing menstruation with dignity in school (Aniebue et al. 2009; Wateraid 2009). The research paper describes and analyses environment of school including school administration, teachers, infrastructure and adolescent girls towards hygiene, safe, proper management of menstruation using qualitative research methodology. The objective of the paper is to find the facilitation and hindering factors in school towards Menstrual Hygiene Management. The effectiveness of the role of government programme is also studied in the research. The study is conducted in co-educational senior secondary government school, Bandarsindari village, Kishangarh block, Rajasthan. For the study, qualitative method is used wherein interview schedule for adolescent girls, interview schedule for teachers, focus group discussion guide and school profile are used to collect data. In total 20 respondents were selected for the study using certain inclusion and exclusion criterion which involves 6 adolescent girls for interview, 7 teachers for interview and 7 adolescent girls for FGD. All the respondents were selected through purposive sampling. The collected data, in the form of narratives are analysed thematically. Major findings reveal that girls miss their classes

due to poor infrastructure, insensitive and unfavourable environment. Girls miss school due to physical discomforts. None of the girl was found to miss school due to psychological and emotional challenges. The proximity of girl's house has helped them in overcoming menstrual discomfort when and if necessary. Even none of the teachers feel comfortable being in school during these days. The implication of the study conducted in school setting in a rural area of Rajasthan reflects poor management of menstrual hygiene due to ignorance, lack of awareness and knowledge on behalf of teachers as well. The cultural/ religious practices/beliefs also played a role in it. Due to government initiative of free distribution of sanitary pad the accessibility of the product has been addressed properly.

**Keywords: Menstruation, Menstrual Hygiene Management, teachers, school administration, adolescent girls.**

**0614555 SAHU, SMITA (Department of Food & Nutrition, Budge Budge College-700137). DIET-HEALTH-ENVIRONMENT TRILEMMA IN THE ANTHROPOCENE EPOCH- A SITUATION ANALYSIS WITH ECOLOGICAL PUBLIC HEALTH APPROACH**

Diet is the inextricable link between both human and planetary health. Humanity encountered unprecedented but unequal progress over the past century while obtaining healthy diets from sustainable food system has become a global challenge. Unhealthy, suboptimal diets pose a greater risk to morbidity and mortality than combination of unsafe sex, and alcohol, drug, and tobacco use do. Ecological catastrophe has wide impact on nutritional status, public health and planetary health. This systematic analysis explores the evolution of the food system and public health portraying discord between the two.

This secondary data based study is an analytical paper based on studies published in PubMed, Google Scholar and scanning the bibliographies of the relevant articles published in English since 1990. After the first-stage screening of titles and abstracts ninety seven studies were sorted, from which forty two full-text articles were obtained through second-stage screening. Finally, twenty one studies were included in this paper, based on their research questions, inclusion criteria and study designs.

Current food systems have been shifted from being supply driven to demand driven involving everything from subsistence farming to multinational food companies. People today eat less meat than the hunter-gatherer ancestors but suffer more diet related diseases such as diabetes, cardiovascular diseases as the nutritional composition of recent domesticated meat differs to that experienced by pre-agrarian foragers. The monoculture-intensive, yield-oriented agricultural revolution triggered by the major food crisis resulted in less diversified diet compromising the quality of food. Then the industrial revolution came up with new variety foods such as refined sugars, cereals, and vegetable oils which have augmented the burden of inflammatory disease. Deviation from circadian rhythms in terms of eating patterns, sedentary or obesogenic lifestyle as well as excessive adherence to processed and junk foods serve as the third major transition. The biocultural adaptations to new foods during this anthropocene have influenced human evolution and led to a mismatch between ancient genes, contemporary diet and lifestyle contributing to the diseases of civilization- metabolic and degenerative disorders. Selection for higher yield variants and elevated atmospheric CO<sub>2</sub> often result in lower protein and micronutrient content of staple food crops. The fiber, micronutrient, and polyphenolic antioxidant potential of the ancient Paleolithic diet was up to three times that of the conventional diet. Reliance on homogenous diets and artificial selection of crop plants or livestock has come along with a plethora of adverse consequences for public health, nutrition, genetic diversity and the environment.

Government policies need to shift from politically popular national priorities such as only increasing the supply and reducing the costs of food to the supply of high-quality, nutrient-dense foods rather than the energy-dense varieties. Despite the over-reliance on GDP growth as the main indicator of human progress, the focus should be on better metrics for assessing human progress considering the integrity of natural systems.

**Keywords: Diversity diet, planetary health, sustainable diet.**



**0614556 SARAVANA, K; STANISLAUS, ELANGO AND NISARGAPRIYA T. S (Department of Post-Graduate Studies in Social Work Bengaluru Central University, Bengaluru-560001). NUTRITIONAL STATUS AND QUALITY OF LIFE AMONG THE MIGRANT LABOURERS: A STUDY IN KARNATAKA**

Rural to urban migration is increasing in India for both short and long-term movements. Nearly half of the migrants find their destination in the construction sector. Bengaluru and other sub-urban areas in Karnataka have emerged as the main hub for the south Indian migration, people migrate due to the various push and pull factors. Migrants seek immediate job for their livelihood. The migrant people employed at housekeeping, textile industry but the highest amount of migrant easily employed at unorganized sectors specially construction industry at Bengaluru, and it attracts people from within the State and from other States also. These migrants suffer from lack of good housing, basic hygiene, health amenities, stressful working conditions, and poor social life. Quality of life (QoL) among a migrant is an essential footstep to understand and progress health status, well-being, and mental health of the population. In the present study, researcher focusing on nutritional status and Quality of life of migrants in Bengaluru, a cross-sectional study was conducted to measure QoL among migrant in Bengaluru. In the primary investigation, it was found that, the migrants had poor physical health was significantly associated with higher income. Strict mechanism for application of legislation is required for wellbeing of migrants.

**Keywords: Migrants, Construction, Workers, Quality of Life, Social Wellbeing, Nutrition**

**0614557 SOORMA, BHAVINI; DAMODAR, SUNITA K AND NACHIKETH B (Department of Psychology, Indian Institute of Psychology and Research, Bengaluru-560095). HANDICAP DIMENSIONS AS PREDICTORS OF QUALITY OF LIFE AMONG PERSONS WITH SPINAL CORD INJURY**

Spinal cord injury (SCI) is a devastating life changing injury which hampers the daily functioning and independence of an individual as it restricts the individual at all levels, physical, psychological and their social and environmental interactions as well. The present study aims to explore the effect of each dimension of handicap on quality of life in persons with spinal cord injury. For an individual suffering from a spinal cord injury, handicap is an important social indicator of the impact the disability has on the individual's day-to-day functioning. A sample of 30 persons with spinal cord injury (both paraplegic and quadriplegic) between the ages of 18-40 years were chosen through non-random purposive sampling and snowball sampling. The sample assessed, included individuals who had suffered injury for 3 months- 12 months, at the time of assessment. The Craig Handicap Assessment and Reporting Technique (CHART) was used to measure the degree of handicap and to measure the quality of life, Quality of Life Index (QLI, Ferrans and Powers) was used. The findings revealed that three dimensions of handicap, namely, occupation, social integration and economic self-sufficiency are predictors of QOL in persons with SCI. The results are of consequence in that they can facilitate in designing interventions for persons with disability to help them cope better and to strengthen their self-belief by understanding their perception of life after injury. The study also finds in its scope that, comparative studies can be undertaken to study the level of handicap and Quality of life among persons with spinal cord injury who have become community integrated and those who continue to be in hospital. A better understanding of handicap dimensions and quality of life of persons with spinal cord injury can be provided by taking the research forward via a longitudinal qualitative inquiry which can facilitate what the persons with disability want, thereby linking it to development of individualized rehabilitation programs for persons with spinal cord injury.

**Keywords: Spinal Cord Injury, Dimensions of Handicap, Quality of Life**

**0614558 SRUTHI, K (Kannur University, Kannur, Kerala-670002). SOCIAL CUSTOMS AND ITS IMPACT ON HEALTH STATUS OF MUTHUVAN WOMEN**

Muthuvans are the tribal group residing at Adimali and Marayur Panchayaths of Idukki district. Their settlements are inside the interior forest and they are less adaptable to social changes. As the tribes have minimal communication with the mainstream society, the progressive changes happening as part of social evolution has less

impact on their life. They tend to follow age old socio-cultural rules and traditions of their ancestors. Muthuvans separates their kids from the family at the time they attain the age of eight to ten. They are then brought up in special dormitories along with other kids. These dormitories are called Chaavadi and Thinnaveedu. A girl child can usually stay in these dormitories until she got married. Thinnaveedu also provide shelter for women at the time of menstruation. However, Thinnaveed's are away from their tribal settlements and in most cases they may not have any basic amenities, which may include adequate water supply or electricity. This paper is an attempt to discuss the impact of different regressive traditional rules and pollution concepts on the mental and physical health of Muthuvan women.

Primary occupation of this community is agriculture. They are very enthusiastic in farming activities. Women play a significant role in these agricultural activities and also deals with the responsibility of household chores. Although the participation of women in labour and shares almost equal responsibilities in family life, they enjoy a lesser social status than men. The tribal traditions reflect a patriarchal predominance is evident. The second issue discussed in the paper is the deteriorating health conditions due to intensive labour and poor health care owing to the traditional customs. The study is conducted at Marayur Panchayath and data is collected mainly through interviews, group discussions and participant observation.

**Key words: cultural rules, mental and physical health, women status.**

## 15. POLITICAL ECONOMY OF INDIA

**0615559 MAHESHWARI, VARSHA (Division of Economics and Agricultural Economics at A. N. Sinha Institute of Social Studies, Patna-800001). A NEOLIBERAL STRATEGY OF DEVELOPMENT IN INDIA: A CRITICAL REFLECTION ON SEZS**

It is a critique of affirmative objectives of Special Economic Zones (SEZs) in India, in context of Investment, Employment and Exports. We have presented an absolute and relative picture of the aforementioned independent variables regarding SEZs to explain its performance through descriptive analysis. A brief illustration has been done on account of economic reforms undertaken during planning period with respect to export-oriented growth strategies to promote industrialization to attain a long-term objective of export promotion, foreign investment and employment generation in India. Consequence of the analysis showed that, the purposeful establishment of zones does not realize its determined objectives. With an increasing amount of investment made in crores during reforms is not equivalent to exports. And also, there is fall in employment elasticity irrespective of the rising numbers of SEZs in India over the years. Thus, SEZs as a neoliberal development scheme for increasing investment, employment generation and exports has terminated its mission for development in India.

**Keywords: Development, Neoliberalism, Special Economic Zones (SEZs)**

**0615560 RANJAN, ALKA (Indian Institute of Psychology and Research, Bangalore-560095). THE POLITICAL ECONOMY OF MENTAL HEALTH IN INDIA: RECENT TRENDS**

India is undergoing the globalization process. India is in a transition state and it is now an emerging economy. It has undergone widespread changes in its economic and political processes. This has had an impact on mental health of the Indian people. There have been changes in lifestyle, economic policies and laws. A systematic review of literature is conducted to study the mental health trends in the political economic context in India.

**Keywords: political economy, mental health, India**

**0615561 SINGH, MUDIT KUMAR (Department of Commerce and Business Administration, Central University of Allahabad, Prayagraj-211002). NETWORK-BASED SOCIAL CAPITAL AND MICROFINANCE IN SOUTHERN RURAL INDIA**

Microfinance interventions through collective action model of self-help groups (SHGs) are very popular in the developing countries. Scholars have argued the role of social networks and the social capital embedded in the social networks in formation of SHGs that helps empowering marginalized sections of the society. These groups provide a good basis of studying formation of social capital in the stratified societies of developing countries such as India. This paper has used a field survey data of 75 southern Indian villages to study the role of network-based social capital in microfinance interventions. The results indicate that caste and religion are the two most important factors binding community together on any given network. In case of building SHGs, these homophily effects disappear and only gender based peer-effect operates in forming SHGs.

**Key words: Microfinance, social networks, social capital, dyadic-logit regression, India**

**0615562 SINGH, SMRITI SAURABH (Division of Economics, A. N. Sinha Institute of Social Studies, Patna-800001). RIGHT TO FOOD IN INDIA AND RIGHT BASED APPROACH TO DEVELOPMENT**

Hunger and destitution have been the central concerns of every nation, institution, state, international institutions and development policies. The current wave to address the issue of hunger and undernutrition in the world as well as in India is rights based approach of development shaped by and with Right to Development. The Declaration on the Right to Development Article 1 states: "The right to development is an inalienable human right by virtue of which every human person and all peoples are entitled to participate in, contribute to and enjoy economic, social, cultural and political development, in which all human rights and fundamental freedoms can be

fully realized” (Article 1.1 Declaration on the Right to Development). Right to Food is part of an overall goal of achieving Right to Development by its definition. Policies are always subjected to critique and improvement; to attain the goal. This paper is exploring National Food Security Act, 2013 (NFSA, 2013)/ Right to food (RTF) in India reflecting various facets of this policy, inter alia, politics and governing; State’s will towards food security for Indians. This paper is also presenting critical analysis of NFSA, 2013/RTF of India to explore whether NFSA, 2013/RTF satisfy the Principles of Right to Development (RTD) and rights based approach of Development. It is examining Right to food on the Principles of Right to development i.e. Equitable, Non-discrimination, Transparency, Accountability and Participation (famous as ENTAP). The methodology used for this analysis is Foucauldian led discourse analysis with tool of Problematisation and employed framework is “What problem represented to be (WPR approach)”. It is reflected from the analysis that State’s will towards attaining food security in India is not in letter and spirit. Investigation with the lens of ENTAP concludes that RTF is weakening rather than being strengthen and it does not satisfy the principles of Right to Development also. RTF has definitely legal edge but its framing and other associated norms like technology load, ignorance of pivotal facilitator to NFSA (i.e. agricultural development, agencies, and judicial support), global economy influences and sustainable provisions to livelihood are keys to success. We put forth the question whether RTF in India satisfies Rights based approach of Development to attain Food Sovereignty through achieving success in affective implementation of Right to Food in India or do we need to propose amendments in this manouvring?

**Keywords- Problemtization, Development, Right to Food**

## 16. POPULATION, POVERTY AND MIGRATION

### 0616563 ANSARY, RABIUL AND DAS, BHASWATI (Utkal University, Bhubaneswar). CIRCULAR MOBILITY OR MIGRATION: A CASE STUDY FROM INDIA

Developing countries like India the poor people living in destitute condition in the absence of sustainable livelihoods last hope left is to migrate from their usual place of residence for either survival strategy or stopped to slide into further poverty. In this present we try to finding out how meaning of migration changed over the time and space? This study examines how factors associated with place of origin and destination along with aspirations shape the different forms of geographical labour mobility in developing countries like India. This study is based on a primary survey of 450 respondents in five sub division of the district, Murshidabad (West Bengal, India). The present theoretical perspective found how poverty, regional deprivations, regional inequality under development intensified regional and income inequality which lead people to circulate. It is observed from the analysis that the economic push is one of the most important reasons for the present form of mobility from Murshidabad district. In economic push in search of employment/better employment and less number of work days and low wage rate are the most important pushing factors acting in the study area followed by decaying of traditional craftsmanship and landlessness. Respondents engaged in Circular Mobility lack of market, less profit margin and high competition in local market is the main push. The analysis of factors associated with place of destination among the compared group indicates those who are in Circular Mobility reported local demand for the products, higher profit margin in the business and cultural affiliation and geographic proximity are major pull factors. Migrants reported employment throughout the year and regular income and high wage rate/wage differences is acting as the pull factors for the selection of particular destination over the others. Among respondents major aspirations are to build pucca houses, educate children and to run business/ enterprise at their own village/district. The analysis of determining role of socio-economic and demographic factors for the present form of mobility from the study area observed life cycle' of human being as an important determinant for selecting type of mobility as migration as a process is always very selective. At the individual level, life cycle (present age of the respondents) is the important determinants for cycles of mobility from the Murshidabad district. At the household level, the family size, number of dependents, and number of daughters/sister at marriageable age are also important determinants for respondents opted for cycles of mobility. At the community level, the determining role of religion (Muslim community), social groups (Other Backward Classes) and social network (relatives) played a significant role for cycles of mobility from the study area. The study suggests large schemes to create the atmosphere of small and medium scale industries in the district which will halt further migration and promotion of sustainable development in every sphere of life.

### 0616564 GUPTA, PRITI (Department of Economics, Ramesh Jha Mahila College, Saharsa, Bihar-852201). IMPACT OF MIGRATION ON HIV TRANSMISSION: A STUDY OF MIGRANTS FROM UTTAR PRADESH

Migration is a growing phenomenon that has important development implication for both sending and receiving areas. From the last some decade migration is increasing rapidly and that is one of the most visible manifestations of the globalization process. For sending countries, it provides remittances that lead to increase income and reduce poverty, resulting improved health and enhance education that promote overall development. In spite of its potential positive effect and well being, there are some issues which increasing and affecting both, sending and the receiving areas. The gains from migration come at substantial social and health cost of migrants and their families. At the place of destination, migrants have to face challenges like integration in different society, job competition, loneliness, lack of familiar atmosphere etc, these all situation make migrants more prone for the different kind of hazardous disease especially for HIV infection. Health of the migrants, especially regarding to HIV/AIDS among migrants is one of the emerging issue that can't be neglected to receive the profit from migration for the development. With the help of primary data this paper tries to explain the relationship between migration and HIV/AIDS infection among migrants who are from Uttar Pradesh. Total 156 HIV migrant patients have been taken who are from Uttar Pradesh. Findings indicate that at destination, sexual practices most often associated with increased HIV risk with limited condom use, heterosexual relationship, illiteracy and low HIV knowledge etc that increasing the HIV infection among migrants. Hence to overcome the problem study suggests recommendations that focusing to build new contextually tailored interventions and policies.

**Key Words- Migration, Illiteracy, Awareness, Vulnerability, Heterosexual Relationship, HIV/AIDS**

**0616565 SUPRIYA, BINITA (Department of Political Science, Govt. Sanskrit College, Kameshwar singh Darbhanga Sanskrit University, Darbhanga, Bihar). A STUDY OF INTERCONNECTIONS BETWEEN ILLITERACY, POVERTY, POPULATION AND MIGRATION IN MUZAFFURPUR DISTRICT OF NORTH BIHAR**

Bihar is the fourth largest producer of vegetables, sixth largest producer of Wheat and third largest producer of Rice grain, biggest producer of tobacco and dairy at national level and the largest producer and supplier of juicy fruit 'Shahi Litchi' and 'Mango fruit' in the world. In spite of all these there has not been any significant influence of the agricultural production on poverty alleviation. Muzaffurpur is a strong districts in terms of fertile land, man power supply, major political participation in Loksabha Assembly, 50% reservation for women in Panchayati Raj, Major youth population, even though District has the lowest per capita income in the country at Rs 5,772 against the national average of 22,946 and average female literacy rate is 54.67% and male literacy rate is 71.28% in district. The NHFS-4(2015-16) data shows that hardly 29.8% of women in the district had completed more than 10 years of schooling. Almost half of the women aged 15- 49 years (48%) had never been to school. Due to acute poverty 48% children fewer than five are wasted and stunted. If we collect data of the last few years, then the poverty alleviation and Literacy programme has become just a game of statistics, why the policies of the government are weak and where they are weak, this is a concern for holistic development for rural people of North Bihar.

## 17. RURAL TECHNOLOGY, SOCIAL ORGANISATIONS AND RURAL DEVELOPMENT

### **0617566 RAGHAVENDRA, S.V (TTBD dept. CSIR-Central Food Technology Research Institute, Mysuru Karnataka-570020). POTENTIAL FOR CSIR-CFTRI FREE TECHNOLOGIES IN RURAL SECTOR**

Indian rural sector is characterized by many problems like rising unemployment, marginal and depleting land holdings, migration of labour leading to widening of rural urban divide, lack of basic amenities, reducing income levels, inaccessibility to education, technology etc. hampering the balanced regional development in turn affecting the economic development of the nation. Hence all the government plans programmes and policies are aimed at developing of rural sector which is vital sector contributing to the economic growth of the country. Alternatively rural India is bestowed with several sectoral advantages like large scale availability of raw materials, low cost of living compared to urban counterparts, presence of cheap labour, vast untapped markets, steady demand for goods and services which when utilized conscientiously by making use of the government support extended on a time bound manner can result in starting of new business units, rural enterprises that can contribute to the economic progress. Among the avenues available Food processing sector offers immense opportunities for overall development of the rural economy like utilization of raw materials (horticulture and agriculture products), value addition to the products thereby reducing wastage, providing employment opportunities and openings for skill development of the masses making them employable.

CSIR-CFTRI a constituent laboratory operating under Council of Scientific & Industrial Research, Department of Science & Technology, Government of India has been playing a significant role in the development of food processing sector in rural areas of the country. Among the several activities undertaken by the Institute in this direction the free technologies of the Institute have a huge potential in catalyzing rural growth. As availability of raw materials is a key factor in running of the rural enterprises these technologies offer wide options among the commonly available raw materials and natural resources. Free technologies available with CFTRI are Amla candy, Composite ragi bread, Fruit spreads, Ginger dehydration and bleaching, Green chilli sauce, protein enriched buns, Ready to use idli batter, Ready to use dosa batter, turmeric curing and polishing, cereal flakes rice, refining of millets, rice milk mix, Hand operated papad press, Leg operated papad press, pedal operated miller dehuller. These technologies are based out of naturally present fruits & vegetables, cereals, spices and basic machinery that are of day today usage and application to the society thereby offering reasonable demand and business potential to the aspirants who are willing to use them and start their food processing units. The technologies can be availed at no investment from the institute while visiting the website and going through the registration procedures.

This paper throws light on free technologies available with CSIR-CFTRI their utility, registration procedures and other activities undertaken by the Institute pertaining to the free technologies.

**Key words: CSIR-CFTRI, rural sector, free technologies,**

### **0617567 SARKAR, SHARMISTHA AND MUKHOPADHYAY, SAYANI (Department of Geography, Asutosh College, University of Calcutta-700026). SUSTAINABLE LIVELIHOOD THROUGH HANDLOOM INDUSTRY- A COMPARATIVE STUDY BETWEEN WEAVERS CO-OPERATIVE SOCIETIES AND HANDLOOM CLUSTERS IN HUGLI DISTRICT OF WEST BENGAL**

Integrated Handloom Cluster Development Scheme (IHCDS) is being implemented by the Development Commissioner for Handloom , Ministry of Textile, GOI, since year 2005-06. The main aim of this holistic approach is to make these age old traditional handloom clusters of our country globally competitive. There are number (7) of clusters established under this scheme in this district. The study is mainly conducted in different weavers concentrated areas of Hugli district taking 118 weavers as sample size. The main objectives of this paper is to find out the main differences between the functions of traditional Primary Weavers' Co-operative Societies (PWCS) and the modern Handloom Clusters, in terms of their production and marketing strategies . The paper also intends to bring a comparative analysis on the economic condition between the weavers under the Handloom Cluster and weavers under Primary Weavers' Co-operative Society, because there is a huge gap in wage level between these two

organisations. As an example, after weaving a 'Naksha Paar Boro Buti' saree a weaver of PWCSs can earn a paltry amount of Rs. 114.00 to 171.00 whereas, a weaver of Handloom Cluster can receive as much as Rs. 233.00 to 285.00 due to difference of quality of sarees between the organisations. It can be said that though there are plenty of skilled weavers under PWCSs but unfortunately they are only doing their traditional practices without assessing the market demand, therefore, the market sphere of the PWCSs shrinks day by day. But on the other hand, different contemporary designed sarees are produced from the Handloom Clusters which has huge demand in the market. Therefore, there is sharp difference in the production, profit and employment generation between these two organisations. The paper also highlights the main hindrances of the PWCS which compelled the weavers to do traditional designs. At the same time the SWOT analysis has been done to identify potential market and also some measures are suggested for future development of the industry as a whole.

**Key words: Handloom Cluster, Primary Weavers' Co-operative Society, Modernisation.**



**18. SCIENCE COMMUNICATION AND SCIENCE POPULARIZATION**

**19. SCIENCE, TECHNOLOGY AND SOCIAL DEVELOPMENT**

## 20. SOCIAL PROCESSES, SOCIAL STRUCTURES AND SOCIAL ALIENATION

**0620568 BHAWNA AND JHA, PASHUPATI (Department of HSS, IIT Roorkee, Uttarakhad-247667).  
STRUCTURAL AMBIVALENCE: ENGLISH WITH INCLUSION**

This paper aims to study Indian English, from various perspectives of inclusion in the process of conceptualizing language as multilinguality. The Indian spirit of creativity, which contains a rich past, has been long created by the timeless works of great Indian Literary figures, is shifting to Indian English. English has been absorbing its root in Indian regional languages. Like the history of the growth and maturation of all other regional languages, Indian English has a nascent history of one century. Indian English, unlike other regional languages, binds in it the southern national effect to the northern. Indian English, having suffered with a backlog of regional identification is counterproductive to the response where an exclusive nationalistic approach tries to legitimize Hindi with several national agendas. It has been thoroughly translating for the Western world. The homogenizing effect of translation is a worldwide phenomenon nonetheless infinite plurality lies in its diversity. The social structure and cultural milieu transcendence thereroot to flourish a change, effective to speaker of Indian languages. The Draft National Education Policy 2019 (DNEP19) is a retrograde to this forward moving step. This policy takes a step to discourage English language by evoking the national spirit through Hindi or national vernacular languages is rather an absurd idea when English became part and partial of the life of Academics and enlarging public sphere. The enigma of English is all at the center. Indian English becomes an integral part of our social structure with existing fact of conferring Janepeeth Award onAmitavGhosh, who is a leading figure in Indian English Writing.As a student of language and literature, the act of writing to me is to explore the inclusive-selfthrough the structure of Indian English Writingwith a liberal thinking process. The paper explores the idea of inclusive-self in three parts. The first deals with the process of cultural hybridity to contextualize Indian English by reviewing and analyzing the works of Homi K. Bhabha, Braj. B. Kachru, B.N. Patnik, RamakantAgnihotri and others leading critics of this area. The second part throws light on the process of creativity in Indian English in enlarging public sphere. The third and the most important part keep the idea of language inclusion through the process of creativity in current National Education Policy system.

**Key words: Language Inclusion, Indian English Creative Writing, DNEP 2019.**

**21. UNITY OF SCIENCE/SCIENCE OF NATURE-HUMANS-SOCIETY**