INTERNATIONAL INSTITUTE FOR POPULATION SCIENCES
(Deemed University)

WORKSHOP ON ENVIRONMENTAL SUSTAINABILITY AND MODELING

13TH – 15TH MAY, 2014

Organized by

Population - Environment - Settlement Project (POP - ENVIS)

Funded by Ministry of Environment and Forest (MoEF)

Compiled By

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Background

Realising the importance of Environmental Information, the Government of India, in December, 1982, established an Environmental Information System (ENVIS) as a plan programme. The focus of ENVIS since inception has been on providing environmental information to decision makers, policy planners, scientists and engineers, research workers, etc. all over the country. Since environment is a broad-ranging, multi-disciplinary subject, a comprehensive information system on environment would necessarily involve effective participation of concerned institutions/ organisations in the country that are actively engaged in work relating to different subject areas of environment. ENVIS has, therefore, developed itself with a network of such participating institutions/organisations for the programme to be meaningful. A large number of nodes, known as ENVIS Centres, have been established in the network to cover the broad subject areas of environment with a Focal Point in the Ministry of Environment & Forests. Both the Focal Point as well as the ENVIS Centres has been assigned various responsibilities to achieve the Long-term & Short-term objectives. For this purpose, various services have been introduced by the Focal Point. ENVIS due to its comprehensive network has been designed as the National Focal Point (NFP) for INFOTERRA, a global environmental information network of the United Nations Environment Programme (UNEP). In order to strengthen the information activities of the NFP, ENVIS was designated as the Regional Service Centre (RSC) of INFOTERRA of UNEP in 1985 for the South Asia Sub-Region countries.

Objective of the Workshop:

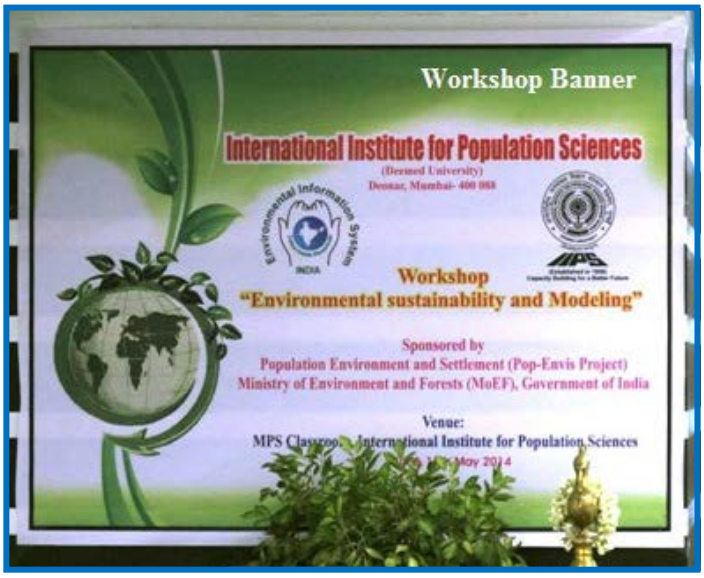
The principal objective of this workshop was to create knowledge and capacity building for the students and teachers on issues related to environment and population especially on solid waste management and environmental modelling.

Participants:

A total of seventy seven (77) students from M.Sc., M.Phil. and Ph.D. with various background ranging from Mathematics, Statistics, Social Sciences from different academic institutes in Mumbai including International Institute for Population Sciences (IIPS), Tata Institute of Social Sciences (TISS) and National Institute of Industrial Engineering, Powai participated in this workshop. Few faculties from IIPS also attended the workshop. Names of the participants are enclosed in **Annexure-I.**

Inaugural session:

The workshop was inaugurated on 13th May at 10 am with lighting the lamp by Prof. F. Ram, Director, IIPS, Dr. M. K. Kulkarni, Registrar, IIPS, and Dr. Aparajita Chattopadhayay, Pop-Envis Coordinator, IIPS, Mumbai.




Students receiving registration kit

Prof. F. Ram, in his inaugural speech, discussed the relationship between population and environment. With the interesting example of Maha Kumbh Mela, which takes place every twelve years in India, he explained how merely increased population may not be the cause of environmental pollution. In 2001 Maha Kumbh almost 28 million people took bath in the auspicious river Ganga whereas in 2013 the number increased slightly to 31 million but the amount of waste generated in 20001 was much more than in 2013. In 2013 the waste management was efficient, resulting less environmental pollution. He concluded that ***population, culture and things related to it, and technology***-these three are the most important aspects to manage environmental pollution or sustain it.


Inauguration Ceremony

Dr. Aparajita Chattopadhyay, Coordinator POP-ENVIS, welcomed all the guests and participants, elaborated the objectives of the workshop and introduced the experts to the participants. She told that this is the first workshop after rejuvenation of POP-ENVIS project 2013 June onwards. She also explained the objectives and future plans of the project.

Envis Coordinator briefing the project


Director's speech on Workshop

Objectives

1. Creation of website on Population and Environment with regional language interface.
2. Monthly compilation of News items on Population and Environment.
3. Identification of information/data gaps in the specified subject areas and action taken to fill these gaps.
4. Database creation on Population and Environment.
5. Contribution of news items for ENVIS newsletter on monthly basis.
6. To establish and operate a distributed clearinghouse to answer and channel queries related to the allocated subject.
7. To establish linkages with information users, carriers and providers from among government, academia, business and Non-Governmental Organizations (NGOs).

Future Plans:

Include tree plantation and voluntary service to people. The three main aims of POPENVIS for the future work are:

1. Site suitability analysis for waste disposal in Mumbai and field level survey to understand the

problems people face who are working with the solid waste.

2. Organizing workshops to create community level awareness by disseminating information related to Population and Environment to local schools and colleges.
3. Generating environmental awareness and health check to the slum dwellers.

In this context she shared and discussed one of the POP-ENVIS funded student's initiative on Knowledge Dissemination and Interaction with Slum Dwellers at Mankhurd, Mumbai.

Teaching Session:

Experts for the workshop were Dr. Amiya Kumar Sahu, Dr. D.B. Naik, Dr. T. Jayaraman, Dr. Samapti Guha and Prof. Faujdar Ram. The workshop was conducted as per the schedule (see **Annexture I**).

Dr. Amiya Kumar Sahu (10:35am- 12pm)

Dr. Amiya Kumar Sahu, President and founder of National Solid Waste Association of India (NSWAI) delivered the first lecture of the workshop on **"Integrated Municipal Solid Waste Management for Sustainability, Environmental Impact and Assessment in Municipal Solid Waste".** In this lecture he pointed out several important aspects of solid waste management. According to him the chain is like ***Generation, Segregation, Collection and Storage, Transportation, Treatment and finally Disposal*** for solid waste management. Solid waste is going to increase with time as the sources of this are households, vegetable market, restaurants, hotels, and commercial places etc which are likely to increase with time. Hence holistic approach is needed to address this problem.


Dr. A. K. Sahu with Director


Dr. A. K. Sahu's Lecture

'***Segregation at source'*** of wet, dry and toxic materials is key to success of solid waste management. This segregation is necessary at each level of waste collection: household, community and finally at disposal points. After collection and storage of this waste it should be properly transported for recycling. For bio-degradable waste composting by different methods (Vermicomposting, Window, In-Vessel, Bio-bin) can transfer these into useful compost. Construction and Demolition waste can be used in reclamation, recovery of sand. Plastic, Metal, Glass, Paper waste can be recycled by different methods like Refuse Derived Fuel (RDF) using boiler, Biomethanation, Glasification, Pyrolysis, Incineration etc.


Students and scholars active participation


Students and scholars active participation

He further suggested '***4R Principles for Zero Waste***' by Reduce, Reuse, Recycle and Recover. *Zero waste is a rather concept which consider waste as resource*. Though zero waste may seem to be a linear system in real it is a cyclical one leaving no waste to dispose hence no landfill. He concluded with the hope that this concept can be a reality as well as will be responsible for sustainability if the stake holders (Municipality, financial institutes, NGOs, Private sectors, Service users), Factors (Technical, Environmental, Financial, Policy/Legal, Institutional and most importantly Socio-cultural) and the Waste System work in sync.


Query asked by student


Query asked by student to Dr. A.K.Sahu

Question Answer Session (12:30pm-1:30pm)

The question –answer session was quite interactive with a lot questions coming from the participants and lasted for almost one hour. Some of the questions are:

Q1. Bornoli: How the typical Indian mind set can be inspired to dispose garbage properly?

Q2. What is the percentage of pollution contributed by Household waste?

Q3. What is sick building syndrome?

Dr. A. K. Sahu answering students

Group photo with Dr. A. K. Sahu

Dr. D.B. Naik (2:50pm-5:15pm)

In the evening session of the first day of work shop Dr. D.B. Naik, Head, Applied Radiation Chemistry Section, Radiation and Photochemistry Division BARC, Trombay , delivered a very interesting lecture on ***"Towards clean Environment"*** with some spectacular practical as well. He particularly emphasized on recycling of thermocol (Styrofoam) and papers. Thermocol is not often recycled because of its low scrap value and it does not bio-degrade and also resistant to photolysis. Thermocol is usually disposed through volume reduction by thermal compacting or can be broken into small pieces (granulation) and remoulded into fresh items. But Dr. Naik has found a new way of disposing thermocol by reducing its volume. Acetone can be used to reduce its volume by 97-98%. He showed that one third part of a large bottle of Acetone can absorb almost two bag-full of thermocol. Once thermocol is reduced in volume a semi-solid (clay like substance) substance is formed which can be given different shapes and used as decorative items. Similarly small paper pieces which are not usually sold out can be stored and then soaked in water to form a paste like substance. This again can be given different forms (Lord Ganesh, nameplate, incense stick stand, decorative items, small basket etc.) using some adhesive (like fevicol) and can be used as decorative pieces.

Dr. D. B. Naik's Demo on making crafts using thermocol and waste

Crafts made from waste thermocol

Student's involvement in making crafts

Student's involvement in making crafts

Close interaction with Dr. D. B. Naik

Query were asked by faculty

Group photo with Dr. D. B. Naik

Second Day (15th May 2014)

Second day of the workshop had three lectures delivered by Dr. T. Jayaraman, Professor, School of Habitat Studies, TISS, Mumbai, Dr. Samapti Guha, Associate Professor, School of Management and Labour Studies, TISS, and Dr. F. Ram, Director and Sr.Professor, IIPS, Mumbai.

Dr. T. Jayaraman (10:15am-1:00pm)

Prof. T. Jayaraman discussed on ***"Modeling for Climate Change".*** Set of variables are studied in climate change like temperature, distribution of temperature over the year, perspiration etc.

These variables are affecting climate and it further is affecting human society and nature. These impacts can be social, cultural or environmental. According to Prof. Jayaraman environment is somehow anthropocentric issue hence anything that is affecting environment is of human interest. As wellbeing of human being is very much dependent on Environment and Climate Change its study has gain a lot importance in recent times. According to Intergovernmental Panel on Climate Change (IPCC) report there is three parts of this issue to be discussed-

1. Science of Climate Change

2. Impact of Climate Change and

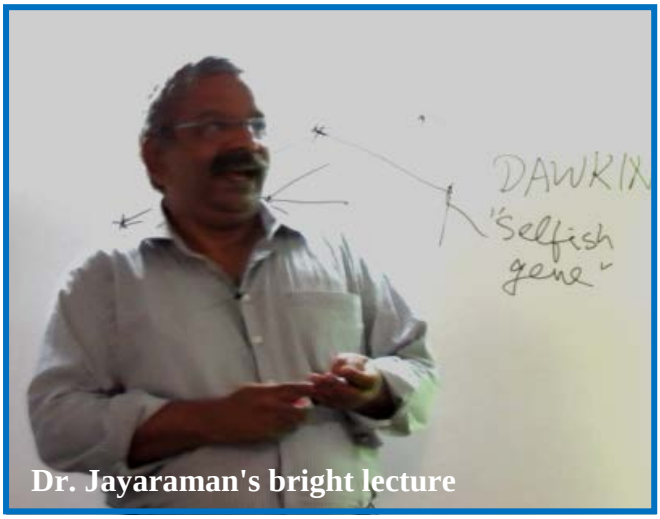
3. What Human do to stop emitting Gas to Nature.

Dr. Jayaraman interacting with Envis Coordinator and Faculty

To understand relationship between climate change, environment, nature and human being mathematical modelling is used. There are different kinds of human, environmental problems that are dealt by mathematical equations; of which some are simple and solvable and some are complex in nature. Real need for Modelling arises due to the complex problems where one has to consider all the possibility that may happen in this complexity (eg. Evolution cannot be reversed and it is a complex and one directional in time phenomena). There are usually two types of modelling used in economics

1. Optimization: Obtaining a solution to a set of algebraic equations with some constraints (inequalities) eg. Problems dealt in Linear programming like assignment or transportation problem

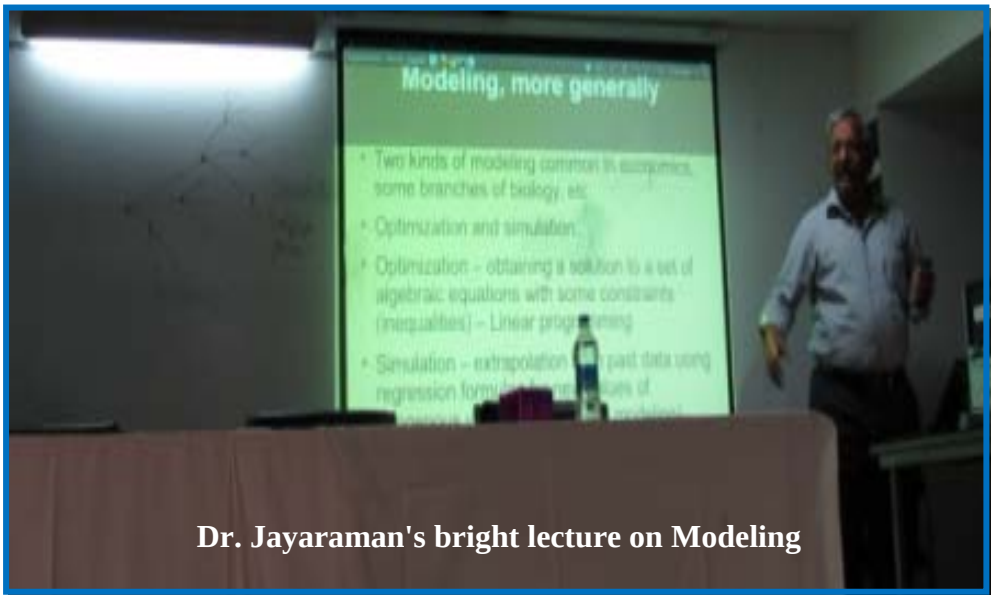
2. Simulation: Extrapolation from past data using regression formula for new values of exogenous variables eg. Statistical modeling



Dr. Jayaraman's bright lecture


Student's participation in Dr. Jayaraman's

Alongside complexity, non-linearity is also a reason for modelling. And the third complexity is feedback i.e. situation where output influences the input. Feedback can be positive or negative in nature and because of its presence linear thing become non-linear. In other features of modelling Prof. T. Jayaraman discussed Parameters of Model, Different range of parameters and how the values of parameters can be fixed. In an example of dynamic modelling he briefly discusses the famous Predator - Prey Model (by Lotka 1910 and Volterra 1926).



Dr. Jayaraman's bright lecture on Modeling


Interaction with Dr. Jayaraman


Query asked by student

After the small tea break Prof. T. Jayaraman explained how using modelling some important problems may be answered. In his paper ***"Climate Change and Agriculture: Current and Future Trends and its Implication for India"*** he has explained how change in climate may affect crop production in different parts of the World. Using present data and modelling (here simulation) he showed that crop production is likely to be affected by increase in temperature and drop in water level. Hence it can be said that the consequence of using crop modelling with climate model may determine how climate will affect crop production in future.

Dr. Samapti Guha (2:20pm-4:00pm)

Evening session started with the discussion of the paper ''***Women Micro Entrepreneurs in Slums of Mumbai''*** by Dr. Samapti Guha, Associate Professor, School of Management and labour studies, TISS, Mumbai. In this study she has collected primary data of women entrepreneurs staying in slums of different parts of Mumbai and discussed about their socio-economic conditions and background characteristics. As a concept, microenterprise development, according to Vasanth Kumari (2012), has been considered as a tool for poverty alleviation and women empowerment. Almost 94.94% of all the Micro, Small and Medium Enterprises (MSME) are Micro enterprises. Gross output contribution of Micro Enterprises is 44.24% of total MSME output in India and 70% of total employment in MSME is Micro Enterprises. Almost 14% of micro enterprises are owned by women. The most interesting finding of her study is that unlike other entrepreneur income of the women micro entrepreneur decreases as their age increases.

Envis Coordinator introducing Dr.S. Guha

Dr. S. Guha's speech

Query asked to Dr. S. Guha

Query asked to Dr.S. Guha

Dr. S. Guha answering students query

Students Participation

Dr. F. Ram (4:20pm-5:15pm)

Dr. F. Ram, Director and Professor, IIPS, Mumbai delivered the last lecture of the work shop entitled 'Issues on Environment and Population'. He elaborated the topic with the example of core demography and periphery demography. While the periphery group, mainly consisting of Developing countries, contributes 80 percent of world population its contribution to world pollution is much lower than the Developed nations, also known as core demography. The luxurious life style of the people of core demography results in more power consumption, more production of consumer goods which results in higher Green House Gas (GHG) emission and hence environmental pollution, whereas the periphery group is suffering more because of the environmental pollution. Not only the garbage (be it scrap, electronics or chemical) is being dumped in these countries they are as well suffering from the GHG effect and global increase in temperature. Global warming and climate change is affecting this periphery group more adversely since they do not have the resources to cope with the change. To sustain the environment these core and periphery demography management is essential. He further argued that according to the Preston Curve increase in Life Expectancy at Birth (LEB) do not depend on real per Capita Income (i.e. economic development) after a certain point. He concluded that ***population, culture and things related to it, and technology***-these three are the most important aspects to manage environmental pollution or sustain it.

Dr. F. Ram's speech


Student's participation


Dr. F. Ram answering students


Student raising a query

VALEDICTORY SESSION:

Mrs. Sudha G. gave vote of thanks to the experts, faculties and the facilitators of the workshop and congratulated the participants for successful completion of the workshop. Each participant was given a certificate for attending the workshop.

Students receiving certificates for their participation in workshop





Students receiving certificates for their participation in workshop



AnnextureI

WORKSHOP SCHEDULE

ENVIRONMENTAL SUSTAINABILITY AND MODELLING (13th and 15th May 2014)

DATE	TIME	SPEAKER	TOPIC	MODERATORS
13.5.2014	10.00AM -10.30AM	**Dr. Faujdar Ram,** Director, IIPS Mumbai. **Dr.Aparajita Chattopadhayay,** Pop-Envis Coordinator.	Inauguration	**Dr.Aparajita Chattopadhayay,** Pop-Envis Coordinator.
	10.30AM -12.00PM	**Dr.Amiya Kumar Sahu,** President ,National Solid Waste Association of India (NSWAI).	Integrated Municipal Solid Waste Management for sustainability, Environmental Impact Assessment in Municipal Solid Waste	
	12.00PM-12.15PM	**Tea Break**		
	12.15PM-1.00PM	**Discussion**		
	1.00PM-2.45PM	**Lunch**		
	2.45PM-4.15PM	**Dr. D.B. Naik,** Head, Applied Radiation Chemistry Section Radiation & Photochemistry Division BARC, Trombay.	Towards clean Environment	**Ms.R Chandrakala,** Pop - Envis RO- IT
	4.15PM - 4.30PM	**Tea Break**		
	4.30PM - 5.30PM	**Discussion**		
15.5.2014	10.00AM - 11.30AM	**Dr. T Jayaraman,** Professor, School of Habitat Studies, Tata Institute of social Sciences, Mumbai.	Modelling on Climate change	**Dr.Aparajita Chattopadhayay,** Pop-Envis Coordinator.
	11.30AM - 11.45AM	**Tea Break**		
	11.45AM - 12.30PM	**Discussion**		
	12.30PM - 2.00PM	**Lunch**		
	2.00PM - 3.30PM	**Dr.Samapti Guha,** School of Management and Labour Studies, TISS	Women Micro Entrepreneurs in Mumbai slums	**Mrs. Sudha,** Pop - Envis Research Officer
	3.30PM - 4.00PM	**Discussion**		
	4.00PM - 4.15PM	**Tea Break**		
	4.15PM - 5.30PM	**Dr. Faujdar Ram,** Director, IIPS Mumbai.	Issues on Environment and Population	
	5.30PM - 5.45PM	**Ms Chandrakala and Mrs. Sudha**(Pop - Envis Research Officer)	Conclusion and Vote of Thanks	

Annexure- II

List of participants

Name	Name
M.K.Kulkarni	Manoj Kharat
Abhishek Kumar	Milind Bharambe
Abhishek Kumar Singh	Mithlesh Chourase
Ajit Kumar Yadav	Mohd. Hifz Ur Rahman
Akash Kumar	Narendra Kumar
Aman Raj Gupta	Parshuram Kale
Ambarish Kumar Rai	Pradeep S.Salve
Amit Kumar	Prakash Chand Debangan Meher
Anjali S. Kulkarni	Radhe Shyam Mishra
Anjana	Rajan Kumar Gupt
Ankita Srivastava	Raju Sarkar
Anshu Baranwal	Raman Mishra
Anshul Kastor	Ramu
Anshuman Paul	Sanjit Sarkar
Arun Kumar Yadav	Sheetal Kamble
Ashwani Kumar	Solomon Debbarma
Ayan Rudra	Srei Chanda
Bal Govind Chauhan	Suchandrima Chakraborty
Bedanga Talukdar	Sunita Patel
Benjamin Debbarma	Surendra Kumar Patel
Bharati Maurya	Sushmita Paul
Bibhishana Bhuyan	Tamal Reja
Bidyadhar Dehury	Tanima Basu
Bornali Dutta	Varsha Pandurang Nagargoje
Brajesh	Vidya Yadav
Chandrashekhar	Vijay Kumar Mishra
Charan Narzary	Arvind Santu Jadhav
Chhavi Paul	Konsam Dinachandra Singh
Deblina Dey	Rahul Mishra
Donald . R. Mawkhlieng	Hanumant
Gudakesh	Sharad Kumar Suman
Guru Vasishtha	Jaymangal Chandra
Gyan Chandra Kashyap	Khullak Meson Maring
Himanshu	Ravi Kant Soren
Jang Bahadur Prasad	Swapnil S. Gudadhe
Jitendra Gupta	Babu Baban Cherarde
Kanchan Negi	Archana Roy
Kaveri Patil	Deepika Rao
Lalit Kumar Rawat	Chandrakala Ramnayan
Manish Singh	Sudha G