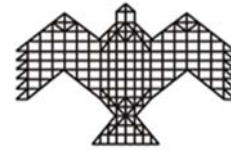


Report of the
8th INSEE Biennial Conference
on
URBANISATION AND THE ENVIORNMENT

4th-6th January 2016
Bengaluru, India

Hosted by



Department of Management Studies, Indian Institute of Science (IISc)

and co-hosted by

Ashoka Trust for Research in Ecology and the Environment (ATREE)
National Institute of Advanced Studies (NIAS)

Sponsored by



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Rohini Nilekani



Summary

The 8th Biennial Conference of the Indian Society for Ecological Economics (INSEE) was held in Bengaluru on 4th-6th January 2016 on the theme of “**Urbanization and the Environment**”. The Conference was hosted by the Department of Management Studies, Indian Institute of Science, along with Ashoka Trust for Research in Ecology and the Environment and National Institute of Advanced Studies. It was held at the Satish Dhawan Auditorium on the IISc campus.

The main aim of this 8th Biennial Conference of INSEE was to explore how environmentally and socially sustainable urbanization is possible in India. With this overarching aim, the Conference objectives were two-fold:

- (i) to generate inter-disciplinary knowledge on the various aspects of urban production, distribution and consumption, and
- (ii) to enable a well-informed academic and policy debate on the relationships between urbanisation and the environment in India.

The Conference had 185 participants, including 102 authors and co-authors, 45 registered student participants, and 23 volunteers. Delegates came not only from many parts of India, but also from 12 other countries (Bangladesh, Canada, Chile, China, Nepal, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom and United States).

There were 4 Plenary Keynote Talks and 82 technical papers presented in 5 parallel sessions. In addition, 6 Plenary Round Table Discussions (RTDs) were held, which brought 27 national and international experts (which included academics, policy-makers and activists) to debate key issues like sustainable South Asian cities, interdisciplinarity in environmental research, challenges of urban waste management, urban water management, climate resilient cities, and the media.

The Presidential Address was given by Dr. Sharachandra Lele wherein he reviewed the evolution of research at the interface of ecology-economy-society in India from the perspective of urban environments, and set the stage for INSEE’s future directions. Ms. Sunita Narain delivered the Inaugural Keynote Address, emphasising that there will be no sustainable urbanization if there is no equitable and fair urbanization.

The Keynote Talk by Prof. Barbara Harriss-White focused on the informal waste economies that are central to urban production, distribution, consumption and reproduction. The Keynote Talk by Dr. Sharat Guttikunda focused on the conceptualization and measurement of urban air pollution, and its implication for regulation. The Valedictory Address by Prof. Joan Martinez-Alier focused on urban metabolism, conflicts and environmental justice in rapidly urbanising India. Overall, the conference consisted of high quality academic and policy-oriented presentations and debates around the challenges in urbanization and the environment.

Report of the 8th INSEE Biennial Conference on URBANISATION AND THE ENVIRONMENT

INTRODUCTION

The 8th Biennial Conference of the Indian Society for Ecological Economics (INSEE) was held in Bengaluru on 3rd-6th January 2016. Bengaluru is one of the world's most rapidly expanding metropolises, and a microcosm of the socio-environmental challenges *and* responses that urbanization and industrialization engenders, and formed an appropriate venue for the conference focused on **Urbanization and the Environment**. The Conference was hosted by the Department of Management Studies, Indian Institute of Science, along with Ashoka Trust for Research in Ecology and the Environment and National Institute of Advanced Studies. It was held at the Satish Dhawan Auditorium on the IISc campus.



The main aim of this 8th INSEE Biennial Conference was to explore how environmentally and socially sustainable urbanization is possible in India. The specific Conference objectives were:

- (i) to generate inter-disciplinary knowledge on the various aspects of urban production, distribution and consumption, and
- (ii) to enable a well-informed academic and policy debate on the relationships between urbanisation and the environment in India.

The diverse aspects and processes of urbanisation and their multi-pronged relationships with the environment were covered under 9 sub-themes:

1. Urbanization, Industrialization and Climate Change
2. Culture, consumption and sustainability of cities
3. Urban Commons, Institutions and Movements
4. Urban environmental governance and technology
5. Urban Water: From source to disposal
6. Urban-rural Environmental and Resource linkages
7. Air pollution, Solid Waste and Human Health
8. Urban ecologies and biodiversity
9. Rural in the urban: Agriculture in Cities

The call for papers was put forth by the INSEE Scientific Advisory Committee (SAC) in May 2015. The SAC worked out the thematic grouping of issues, the criteria for short listing abstracts, identification of the reviewers and the review process, with a minimum of two reviewers for each abstract.

A total of 237 abstracts and 8 panel proposals were received in response to the call. Of these 162 abstracts and 2 panels with research papers, were shortlisted for further submission, totalling to 171 papers in all that were then asked to submit extended summaries. 112 extended summaries (3000 to 4000 words) were received by 1 October 2015, of which 92 were then selected for presentation in the Conference. Eventually, 82 papers were presented in the Conference. (See Appendix 1 for the detailed conference programme, and Appendix 2-3 for the list of SAC members, and Local Organizing Committee members.)

The Conference, held during 4th-6th January 2016, included a pre-Conference field visit on 3rd January to Jakkur lake, Bengaluru. The Conference had a final tally of 185 total participants, including:

- 102 paper presenters or co-authors
- 45 registered student participants
- 23 volunteers

These included participants from 12 other countries: Bangladesh, Canada, Chile, China, Nepal, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom and United States. INSEE's intellectual commitment and continuity was evident in the engagement of past INSEE Presidents and Vice-Presidents (Kanchan Chopra, Gopal Kadekodi and M V Nadkarni), who participated actively and advised several young scholars at the Conference.

During the three days, 82 papers were presented across 9 sub-themes, which the SAC and Local Organizing Committee had arranged in 5 parallel sessions, of 3-4 papers in each session. The Conference plenary sessions had 6 Round Table Discussions with a total of 27 speakers/moderators. This was in addition to the 4 Keynote Addresses and the Presidential address in the plenary sessions. The Conference kit included the Conference book with all the abstracts (of all the plenary sessions and the technical papers presented in the parallel sessions), a flash-drive with the contents of the book and the list of participants with their contact details, a re-usable water bottle (to ensure that plastic would not be used at the Conference venue), and file folder with the printed programme, INSEE and IISc (Department of Management Studies) brochures and publication announcements.

The Conference brought together some of the best work on Urbanization and the Environment and was enriched by animated discussions and debates in all the sessions. This report captures the essence of the research presented and discussions that occurred. It concludes with a synthesis of the Conference proceedings that addresses the Conference objectives of advancing our interdisciplinary knowledge of the ecology-economy-society interactions in the context of urban environmental issues, and engaging with the policy processes that can lead to sustainable urbanisation.

PLENARY SESSIONS

The Conference began with Prof. H. Chanakya (IISc) welcoming the delegates and the INSEE Vice-President, Prof. Seema Purushothaman presenting the Conference theme, contents, organization and expectations.



Figure 1. (L to R) Prof. Chanakya, Prof. Purushothaman, Dr. Lele, Dr. Raina and Dr. Narain at the Inaugural Plenary

The **Presidential Address** by **Dr. Sharachchandra Lele** followed; in which he reviewed the research that has occurred in India at the interface of ecology-economy-society since the establishment of INSEE, with a particular focus on urban environmental research. Acknowledging the contributions of ‘intellectual giants’ such as Sunita Narain, Kanchan Chopra, M. V. Nadkarni, Gopal Kadekodi, Juan Martinez-Alier and Arild Vatn who were present in the audience and whose contributions had shaped ecological economics, environmental research more broadly and INSEE itself, he pointed out that INSEE had broadened the debate from economics to ecological economics to a bridging of the divides between economics, history, sociology/anthropology and political science along with the natural sciences and engineering.



Figure 2. Presidential Address by Dr. Sharachchandra Lele

He pointed out that since the formation of INSEE, which almost coincides with the review of socio-ecological research in India published by Guha in 1997, scholars have fulfilled Guha’s call for more research on urban environmental issues from many angles. What is perhaps needed is greater attention to interdisciplinary linkage and rigour. In doing so, members of

INSEE and other like-minded scholars must rise to the challenges, both internal and external, that generating ‘knowledge for change’ will inevitably involve.

Dr. Sunita Narain (Director General, CSE) then delivered the **Inaugural Address**, emphasising that there will be no sustainable urbanization if there is no equitable and fair urbanization. This trend of polluting first and then cleaning up later – especially cleaning up for a select few, should stop. Cities designed for the few who can afford to pollute (private cars take up 90% of road space in Delhi, a city where only 15% of the population owns cars) have now brought the realization that we have to plan our cities differently. There are policy relevant findings like increased ‘walking and cycling’ options in cities with shorter trip lengths. But these may not find their way into planning for cities by reinventing mobility. Unfortunately, it is the same phenomenon of catering to a few rich that marks urban water and waste too; so is it with global climate change. The recently concluded Paris agreement is not about reducing emissions, but about appropriating the carbon budget.



Figure 3. Dr. Sunita Narain delivering the Inaugural Address



The **Keynote Talks** day 2 re-emphasised the social and political embeddedness of and the technological complexities associated with environmental issues in urbanization. **Prof. Barbara Harriss-White** (Emeritus Professor, Oxford University) analysed the informal waste economies that are central to urban production, distribution, consumption and social reproduction systems, and that disrupt the circular mechanisms of

natural systems. Urbanisation in India reinforces the informal waste economy, which is embedded in the complex structure and relations of capital, caste and the formal actors (including regulatory authorities) involved. Sustainability and equity then cannot easily become part of this larger social-political narrative of ‘urbanization and the environment.’



Dr. Sharat Guttikunda (Director, UrbanEmissions.Info) delivered a **Keynote Talk** that questioned the current official conceptualization and measurement of air pollution. It is perplexing to see how the state focuses on technical solutions to control air pollution, with no attention paid to many necessary institutional changes that are absolutely essential to address the multiple sources and contexts of pollution. That even a little effort to provide information to citizens can make a major difference is still beyond the techno-centric cognizance and planning for pollution control. Without this information support and pro-active

engagement with citizens, the vicious circle of pollution and pollution-based industry (which incidentally reinforces pollution and adds incomes to the privileged few) will continue.

The **Valedictory Address** by **Prof. Joan Martinez-Alier** (Emeritus Professor, Universitat Autònoma de Barcelona) focused on urban metabolism, conflicts and environmental justice in rapidly urbanising India. Sustainable cities may indeed be an oxymoron, but our purpose then should be to look for ways to achieve “less unsustainable” cities. Here, the role of ecological economics in understanding social metabolism – the interaction of human societies and natural environments in terms of flows of energy and material – is crucial. The entropic nature of the industrial

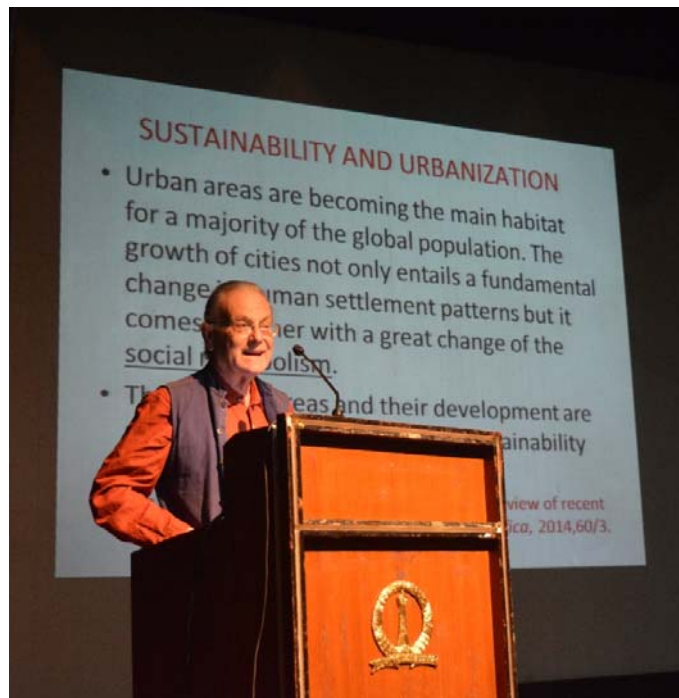


Figure 4. Valedictory Address by Prof. Martinez-Alier

economy, the conceptualization and study of “metabolic rift,” must be explained as “relationships between environmental conditions and the historical and spatial patterns of inequality that manifest themselves within the city.” While some efforts are on, like the Environmental Justice Atlas (EJAtlas) (recording 1700 cases by January 2016, of which 219 are in India, and 29 are Indian urban conflicts), there is a lot more to be done to understand and enable compact cities, give increasing attention and value to urban ecosystems, and support those struggling for the environment in various ecological distribution conflicts.

ROUND TABLE DISCUSSIONS (RTDS):

The RTDs brought 27 experts, including academics, activists, and policy makers, to debate key issues like sustainable South Asian cities, engagements with inter-



Figure 5. Sustainable cities RTD: (L to R) Madhav Badami, Atiq Rahman, Suren Erkman and Sagar Dhara

disciplinary research, challenges of urban waste and urban water, climate resilient cities, and the media.

RTD 1 “Sustainable Consumption and Production in South Asian Cities”

This RTD was based on a background paper prepared by Ulka Kelkar (ATREE) for INSEE, with inputs from Madhav

Badami and Soumyajit Bhar, with support from UNEP.

The moderator, Madhav Badami, posed key questions: what does sustainable consumption and production (SCAP) mean in the South Asian context? And how might that be analysed? Is SCAP a sufficient condition for urban sustainability and vice versa? How best can interdisciplinary research about SCAP be built in South Asian countries? These were fielded by Sagar Dhara (Cerana Foundation), Atiq Rahman (BCAS, Bangladesh) and Suren Erkman (University of Lausanne, Switzerland). The panellists agreed that there was little understanding and even lesser demand for and opportunities to reflect on ‘sustainability’ of cities in South Asia. The middle class consumption patterns in these cities, and increasing aspirations to imitate the West, drive these unsustainable cities – especially the small towns. It is important to note that the underlying attitudes, social norms, and values drive the choices that we make.

RTD 2 - “From Ecological Economics to Ecology, Economy and Society: Engagements with Interdisciplinarity in Environmental Research”

This panel was organized by ATREE, as a part of its 20th-year celebration, with support from the Royal Norwegian Embassy. The panel, moderated by Sharachandra Lele (ATREE), focused on the conceptual, organizational and pedagogical aspects of interdisciplinary environmental research.

The panellists, Kanchan Chopra (Former Director IEG, Founding President INSEE) and Desmond McNeill (University of Oslo, Norway) agreed that the theoretical formulations and conceptualisations in economics have been rather heavy in ecological economics as practiced today. Whether this was due to a lack of alternative theoretical or explanatory frameworks was explored by Arild Vatn (Norwegian University of Life



Figure 6. Speakers in the Round Table Discussion on Interdisciplinarity: (L to R) Kanchan Chopra, Desmond McNeill and Arild Vatn

Sciences, Former President of the European Society for Ecological Economics); particularly given the institutional economics and evolutionary economics frameworks, increasing opportunities for economists to work in interdisciplinary teams- especially given a broader framing of environmental research involving natural and

physical sciences. The panel concluded with the need for professional societies like INSEE to be aware of and push the envelope to become more inclusive and biophysically and socially realistic in their analysis of economy-society-ecology issues.

RTD 3 – “Waste-full Cities: Ground level challenges and research questions” (organised and sponsored by Centre for Policy Research, Delhi)



Figure 7. Round Table Discussion on Waste-full Cities: (L to R): S Dasgupta, NC Narayanan, Sasaka Velidandla and R Rama Swamy

The RTD, moderated by Shubhagato Dasgupta (CPR), had a group of academics and administrators discussing waste water (black water) and faecal sludge management. The panel included D T V Raghu Rama Swamy (School of Infrastructure, RICS School of Built Environment (RICS SBE), Amity University and Infrastructure Development Corporation (Karnataka) Limited), Sasanka Velidandla (CDD Society, Bangalore), and N.C. Narayanan (Centre for Technology Alternative for Rural Areas, Indian Institute of Technology, Bombay). The panel agreed that urban sanitation, especially waste water management, is not only a technological and environmental issue but a social issue above all and remains an under researched and less understood concern. They demanded that society, as well as policy makers and implementers should understand

the deeply embedded nature of the conventional approaches to sanitation. The panel highlighted the need for alternatives (like decentralized waste water management which has been successful since the 1960s) which must be supported and established at scale by the state. Starting from infrastructure to mental (administrative) blocks several bottlenecks prevent their adoption; these must be identified and removed. Another key question was about the socio-cultural issues related to sanitation in India. In specific the role and social position of the sanitation worker was discussed as an issue that will impact the future developments related to improving sanitation. Sustainable urbanisation must essentially be knowledge based, equitable and just.

Finally the RTD closed with a common view among the panellists and participants that stressed the need for small towns and citizens therein to take up this agenda of greater state support for alternatives to reduce and manage waste.

RTD 4 - “Challenges in Urban Water management” was organized by INSEE with sponsorship from Rohini Nilekani.



Figure 8 Veena Srinivasan (moderator) initiating the Round Table Discussion on Urban Water Management, involving K J Joy, S Vishwanath, Mohan Kumar and Arvind Shrivastava

This panel, moderated by Veena Srinivasan (ATREE), focused on how cities in India would be able to provide fresh water to its population and manage the waste water they generate. Among the panellists were S. Vishwanath (Biome Environmental Solutions, Bangalore) who presented technological and governance solutions to the water problem, and K. J. Joy (SOPPECOM, Pune and INSEE-EC member) pleaded for a better understanding of how cities were exploiting the hinterlands, water bodies and populations there, to feed their own un-sustainable systems. The other two, M. Mohan Kumar (IISc) and Arvind Shrivastava (Secretary, Finance Department of the Government of Karnataka) presented the range of problems faced when infrastructure and capacity building for water supply or waste water management are attempted. There are good initiatives; some robust studies on these are available. But major governance questions like ensuring equity across cities and within each city needs more effective participation from citizens and better political appreciation of this scarce resource.

RTD 5 – “Resilient Cities and Transformative Adaptation”, was organized by Indian Institute of Human Settlements, Bangalore.

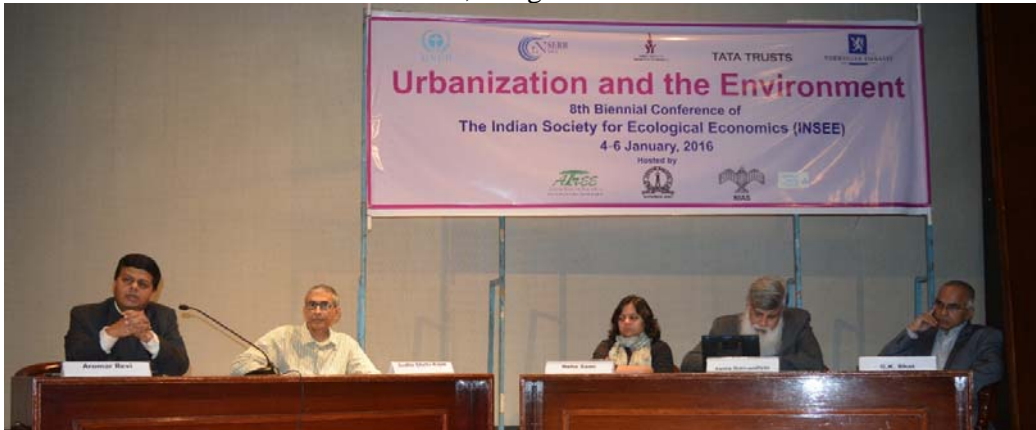


Figure 9. Round Table Discussion on Resilient Cities: (L to R): Aromar Revi, Sudhir Chella Rajan, Neha Sami, Partha Mukhopadhyay and G K Bhat.

The panel, moderated and led by Aromar Revi (IIHS Bangalore), brought out some of the tensions, that are bound to grow in the near future, about resource allocation between rural and urban populations, and the increasing concern about environmental degradation in urban and peri-urban areas. The panellists debated how climate change would worsen existing urban challenges of major gaps in the provision of basic services, and agreed that it would be an extremely difficult politically and economically to ensure that cities take up the ‘transformation adaptation’ agenda, where the spatial locational advantages and economic comparative advantages can be enhanced to reduce climate risks to enterprises, public services and individual households.

While Sudhir Chella Rajan (IIT, Madras) and Partha Mukhopadhyay (Centre for Policy Research, New Delhi) agreed that the vulnerability of cities to climate risks would be manageable with increasing capacities for adaptation, there was disagreement about the ways in which an ethically considered allocation of resources or adaptive capacities could be built; the latter opined that existing financial and political strongholds are unlikely to yield to any ethical concerns, but may bend to economic advantages or costs. Panellists G K Bhat (Taru Leading Edge Pvt. Ltd., Ahmedabad) and Neha Sami (IIHS, Bangalore) were clear in their articulation of different adaptive capacities among urban communities, and the role of the state in enabling and sustaining these capacities. But much of the data that needed to be placed for public awareness and responsiveness was missing or inadequate.

RTD 6 – “Environmental Narratives: Urbanizing Environments and Media”

was organized by T. V. Padma (science journalist, with Nature) in collaboration with INSEE. Panellists Kalpana Sharma and Darry D’Monte raised the need to understand ‘how the media is structured’ and controlled, before analysing how and to what extent urbanisation and the environment (and also development in general) are covered. It is no secret that India’s corporate houses control most media houses, and their emphasis on profits and benefits commercials and advertisements, besides political patronage, determines the course of news coverage. Ammu Joseph demanded that journalists should have ‘better access to research and studies’ on urbanisation. Academics need to communicate better with the media for their studies to reach out to a wider audience or readership. Here, NGOs prove to be a valuable source of information. The fourth

panellist, Ashish Kothari emphasised how the rapid evolution and expansion of digital media, should be used effectively to convey and exchange information on the environment. These new alternative media options, do not follow the same well-trodden path of mainstream newspapers, and have a niche of their own. An example is the virtual “Vikalp Sangam” that provides the space to communicate and interact about environmental-developmental concerns. Community radio and other audio-visual media must be explored, especially with democratic voice for all stakeholders involved. All the panellists demanded that media should not just criticise what is going wrong, but should report what is working well too, and also report on gender-and-environment issues in an increasingly urbanizing world.



Figure 10 RTD on Media: (L to R): T V Padma, Kalpana Sharma, Ashish Kothari, Ammu Joseph, Darryl D'Monte

All the RTDs in this Conference were intellectually rich and thought-provoking both academically and at the level of policy and action. They place on INSEE a major responsibility to enable ‘knowledge for change.’

PARALLEL SESSIONS

The parallel sessions consisted of presentations of the research papers accepted for presentation after two rounds of screening as described earlier. The full list of paper titles and authors who presented is given in Appendix 1. Here, we try to summarise briefly the key points that emerged from these papers under each of the 9 sub-themes, as reported by the Chairs of each session.

Sub-theme 1: Urbanisation, industrialisation and climate change

This theme had the largest collection of papers (21) – with two special sessions on large basin level or watershed level relationships/impacts and on urban-industrial issues that posed environmental challenges in India and China. The papers mainly addressed the cause and effect of targeted interventions made by the state, municipal or local governments or private agencies, for increased urbanisation. They also discussed the specific linkages between growth, urbanization, energy, GHG emissions, and the opportunities to tweak or transform individual and collective behaviour – like use of transport, production practices, and energy use.

One set of papers pointed out that (a) increasing energy consumption with GDP growth in developed and developing countries, growth and urbanization increase CO2 emissions in India, (b) the Environmental Performance Index (EPI) of Indian states shows how the EPI index goes up at initial stages of urban expansion, but EPI index goes down finally after a threshold level of urbanization, the threshold being 25-40 percent urbanization for different states, (c) the environmental disclosures by industry and their performance were not found significantly associated.



Another set of papers flagged that urban workers or populations directly in industry are among the least polluters and suffer the most. It was also highlighted that sustainable transport is inadequate and is not being provided for. Instead of building capabilities and notions of fairness to enable governance, the state seems to be tied to vague notions of progress that do not question the material cultures of mass consumption and an atomized social milieu. While cycling and other means of local transport demand minimal investments, the state (whether in Bangladesh or in India) seems to be tied to massive infrastructure development that not only displaces the poor but adds to pollution.

Sub-theme 2- – Culture, Consumption and Sustainability of Cities

The ten papers in this sub-theme covered questions ranging from the macro-economics of distribution to ensure more equal consumption opportunities in cities to micro-case studies of consumption and cultures of care and conservation even within the (extremely competitive and resource gobbling) urban spaces. There were papers measuring and generating benchmarking frameworks for measuring sustainability indices for cities, ecosystem services and cultural services within cities. A session on e-waste management examined the weakness of regulatory instruments and explored possible improvements in the system by legitimising the participation of informal sector.

Among the promising findings are (a) the importance of slow-growing local economies for sustainable cities, (b) the perpetuation of historical inequalities in the urbanization processes, (c) a dynamic matrix for ecological and socially sensitive locally relevant city planning, and (d) the importance of the social indices (social, environmental and economic pillars of sustainability) for locating and increasing the uptake of public and private investments for sustainable cities. The diversity in normative positions (valuations) and methodological approaches, is a highlight of this session. But the focus on consumption, without much discussion on how the production spaces within the city shape the consumption opportunities, and thereby asking whether and how such estimation of indices or services would reach the policy maker's ear and enable change for sustainable cities. A paper on predicting ecologically conscious consumer behaviour argued that perceived effectiveness of a policy instrument and consumer attitudes do significantly influence consumer behaviour in India.

Sub-theme 3 – Urban commons, Institutions and Movements

The seven papers in this session addressed the diverse and varied environmentalisms in urban areas, with specific papers on groundwater (aquifer mapping and literacy), political ecology of watersheds, shrub jungle and resources, and the urban commons as sinks (for hazardous waste). The papers emphasised how managing the urban and peri-urban commons demands knowledge and competencies way beyond a mere 'resource

conservation” issue; in particular, it demands a historical, political and social understanding of the interactions between the resource and the populations in the urban systems concerned.

A special panel of papers on ‘Smart Cities, but for Whom? The Loss of the Commons and Urban Vulnerability’ drew on work done by scholars on urban commons from various cities in India to present a critical analysis of the trends in transformation of urban commons. The objective was to generate a wider debate on alternatives to the current model of urbanization and urban common’s utilization that emphasize a model of urban growth where the commons takes centre stage: a model that is socially inclusive and environmentally sustainable.



The speakers highlighted the multiple provisioning ecosystem services—food, water, medicine, raw materials—supported by urban commons in urban and peri-urban parts of cities. In addition, a primary concern shared was the current process of urbanization and vision for cities, such as the smart city models that resulted in exclusion from urban commons. Those facing alienation included traditional users and urban poor dependent on urban commons in Bengaluru to meet their livelihood and subsistence use, the fishing community in Mumbai dependent on coastal commons and SC/ST communities in peri-urban Gurgaon dependent on commons for water, fuelwood and fodder. The alienation was highlighted against the contestations over commons resulting from the model of economic development whose chief proponents were the private industries, and often supported by the State. These conflicts were linked to the politics of urbanization and the question of ‘Whose commons are

these anyway?’: the wealthy in cities who prioritize recreational uses or vulnerable urban and peri-urban groups for whose survival the commons were critical. How to foster collective management for both ecological protection and equity in access was a concern shared as well. The panel talks and discussions brought out the importance of commons for urban citizens even in metropolitan cities and urged for alternate models of urbanization around urban commons.

Sub-theme 4- Urban environmental governance and technology

Seven papers were presented, covering different aspects of technological change in governing urban India, and the social mobilisation as well as institutional changes that are necessary for truly sustainable urbanization. The session highlighted how the co-evolution of mobility technology and social institutions, the integrated and cohesive communities, the impacts of size and scope differentiation in industry in the adoption of environment friendly technologies. The papers also highlighted how the effects of specific technologies on water systems (especially the very rivers that feed cities – Indore) are often ignored by city planners and policy makers. A dynamic model was presented, which can give foresights on the impacts of population, business and construction (using an index of quality of life – jobs, water, open space and pollution), and enable technology choices that are least disruptive and most sustainable. That urban spaces are also recipients of pollutants from other spaces, and demand technological and institutional (governance) changes in other spaces was a key point.

Common themes that cut across technological and governance issues in all the papers were (1) the challenges of governance of both air and water pollution; (2) pollution of commons - air and water without any accountability mechanisms and (3) political ecology of pollution where the poor are disproportionately affected by pollution.



Sub-theme 5. Urban –Rural Environmental and Resource Linkages

The four papers in this session were all concerned about how much and till when the rural supplies to urban areas could be sustained. The papers discussed inadequacy of prevalent methods like Payment for Ecosystem Services, the technological and bureaucratic imaginations that frame landscape changes, political and socio-economic challenges in sourcing water for urban development, and the impact of urbanisation on cropland expansion and intensification.

The inequality and the mechanisms of resource transfer (like water) that reinforce inequality were highlighted. The conceptualisation of capability as justice, and the presentation of a complex yet desirable ‘social multi-criteria evaluation’ that is closer to the complexity of the resource transfer question, than a Payment for Ecosystem services, was another important contribution. Especially when existing ecosystem services are being fast depleted and destroyed, the need for a deeper political understanding of resource valuations and power relationships, and better theories and analytical frameworks become obvious.

Sub-theme 6 - Urban water from sources to disposal

The ten papers in this sub-theme present cases of governance and management of water resources in the context of urban localities, urbanizing basins, urban wastewater treatment, understanding household level water use- using innovative methods of investigation and measurement, and intra-household dynamics and gender roles.

Urbanisation and industrialisation depend critically on water, and the governance of urban supplies needs to look at socio-economic, biophysical and governance issues. One set of papers sought to link urban water supply to its source and examine at the

problem at the scale of the river basin. One study (Arkavathy basin, Bangalore) showed that the impacts of climate change on urbanized basins will be intertwined with those of land use change, irrigation shifts, and dropping groundwater tables. Where water rights are clearly assigned, the implications of climate change can be more clearly worked out (Santiago, Chile). Where they are not (as in Delhi/Gurgaon), water-related conflicts emerge in multiple ways.



Figure 11. Prof. Kadekodi (past President of INSEE) moderating a parallel session on Urban Water Management

Another set of papers highlighted the policy and city planning blindness to a wide range of issues beyond supply, even to the point of measuring what quantities are actually delivered. This was considered important – the supplier role – because communities even at the lower end of social hierarchy prefer delivery from institutional service providers. In this context local bodies or smaller civic authorities have specific responsibilities to raise the inclusion level, but in the process face constraints in raising finances to ensure adequacy as well as acquire technology to manage waste water. The papers also reflect the differentiation across social hierarchies – at lower end where access to quality water is the concern, while at the upper end additional constraints arrive in the form of waste management, under given regulatory constraints.

Measures like Willingness to Pay for quality water, and the tendencies to push the drive for privatisation of water supply, despite diseconomies of scale at smaller spaces which can lead to the development of informal water markets were presented. Ability of the people to get water connections, storage space, cost of supply of water in smaller spaces, need to be explored and analysed in detail. While delivery mechanism is the major governance issue, better intuitional mechanism is required for sustainability of the sources. One paper posed the question whether a differential pricing – with slums getting free water and middle class/elite households paying for water would work.

Another set of papers focused on questions of resource sustainability and innovative technology, including approaches to reduce costs and management of waste waters. Sewerage, water treatments and replenishment of ground water, and questions of water use neutrality were also raised, as were questions of missing standards for water quality when the catchments are highly industrialised. In the case of apartment-level

wastewater treatment and reuse, reaching zero liquid discharge is impractical, and reduction of discharge even by 40 to 50 % would yield positive outcome. Several policy issues and alternatives are presented in these papers.

Sub-theme 7: Air pollution, Solid Waste and human health

Municipal solid waste management including household behaviour and the use of waste for energy generation were the key themes addressed by the seven papers in this session. They covered questions about the nature of waste and governance issues in specific cities (Shimla, Kalimpong, Kathmandu valley), specific forms of waste like e-waste, and sites of waste disposal like land-fills.

The study on energy generation (from Bangladesh) evaluated the differences between landfilling and conversion of waste to energy in terms of economic and environmental cost and benefits. Two household waste management studies (i) to understand the awareness and demand for waste management services, and to understand how to incentivize segregation (using contingent valuation method), (ii) to identify the influence of social demographic and economic factors to identify the division of cost between the household and the civic authority through Public Private Partnership (PPP) (using ordered Probit regression), followed. One of the key findings is that the efficiency in waste management is contingent upon service divisibility. The more compartmentalized the management options, the higher the change of private participation the waste sector.

These papers brought forth questions about data, the uncertainty and inadequacy of the regressions, and the narrow focus on GHG emissions, and the assumptions made about the livelihoods, safety and health of informal workers, about 95% landfill, which need re-thinking. The overarching assumptions that waste markets could be formalized, leads to findings about missing markets in the waste sector for developing countries. And this then leads the studies into seeking an economic incentive at each stage of waste management, because it is the condition for PPP to function efficiently in formal market conditions. The waste economy needs much more detailed analysis in terms of the bio-physical and toxic material transformations, the private gains and transactions, economic costs, social biases and political vested interests.

Sub-theme 8- Urban Ecologies, Biodiversity

The four papers here, spanned four important metros and covered four important ecosystems, analysing (i) livelihoods of coastal fishermen (Mumbai), ii) willingness to pay for conservation of the Hussain Sagar lake, (iii) the urban green spaces in Bangalore, and iv) urban ecology of Delhi. The papers mainly focused on management of the ecological problems; they could have addressed what could be done to avert the problems studied, made an effort to make recommendations to ensure that the livelihoods are protected in the backdrop of mounting pressure by the elites. Some methodological issues, like computing the net surplus rather than gross surplus, comparison of the vegetation indexing methodology with the FSI methodology, are crucial. The discussions brought out critical concerns about collaborative behaviour. There is a need for forums for integration and social mobilization that the managers and stakeholders in urban ecologies can engage with more deeply.

Sub-theme 9. Rural in the Urban: Agriculture in Cities

Four research papers were presented in this session. They highlighted the changes in our economic, historical and philosophical approaches to industrialization and urbanization that have resulted in the emergence of “urban agriculture” and “organic agriculture” in urban areas. Persistent concerns about the quality of food supplied by the rural masses, the increasing health consciousness in the urban middle class and elite, increasing specialisation in urban markets, and technological advances (agronomy and pest management techniques) and socio-cultural changes were specified as key drivers of urban agriculture.

CULTURAL EVENT: Songs by Bhoomi Taayi Balaga

In keeping with the theme of the conference, the cultural programme on day 2 was an evening of songs and music by the *Bhoomi Taayi Balaga* (Mother Earth Band) in which they sang songs on themes ranging from the concrete jungle that our cities have become, the forces of globalization behind them, the loss of cultural heritage and proximity to nature and the decline of waterscapes. The band is well known in the Bangalore region for their self-composed modern lyrics combined with traditional and modern tunes and instruments sung in Kannada.



Figure 12. An evening of environment-related songs and music by Bangalore-based Bhoomi Taayi Balaga

PRE-CONFERENCE FIELD TRIP: Rejuvenating Urban Lakes

Once a dirty lake filled with raw sewage and solid waste, Jakkur lake has now become symbolic of a lake management success story that can easily be replicated and sustained. Community ownership and an integrated lake management effort by the stakeholders were vital to bringing the lake back to life. Central to this story is a 10MLD sewage treatment plant situated at the northern tip of the lake from which treated water is let into a man-made wetland that further filters the water and finally fills the lake with water good enough to allow biodiversity to thrive, and also support fishing activities.

It was thus quite appropriate to arrange a pre-conference field trip to Jakkur Lake and the Sewage Treatment Plant to understand how an integrated approach to wastewater treatment and lake management helps all the stakeholders achieve their goals. Twenty-eight conference participants from all across the globe registered and attended this event. The group was ably guided by S. Vishwanath (Biome Environmental Solutions) along with Annapurna of Jalaposhan Trust, a citizen's group that is an integral part of the management of the lake. The group was first led to the large open well towards the east of the lake, where they were able to witness the extent of groundwater recharge that the lake provides. The group then saw the constructed wetland that takes the treated water and removes nitrates and phosphates from it before releasing it into the main lake. The STP visit was as exciting as the lake itself as it demonstrated how raw sewage can be treated up to secondary levels, good enough to be let into a lake. Finally, knowing that even the sludge, a by-product of the treatment process is used as fertilizer in agriculture, allowed the group to understand the significance of such a closed loop model of water management.



Figure 13. (Clockwise from top) Conference participants leaving for Jakkur lake field trip; resource person S Vishwanath explaining a point; coracle used by fishermen who live off Jakkur lake

The field trip to Jakkur lake provided a fascinating insight into the interdependence between urban water use, wastewater disposal, groundwater recharge, fishing and urban environmental amenities that can be restored through citizen initiative.

CONCLUSION: INSEE's road ahead

In the INSEE members priority survey conducted in March 2015, three priority activities were identified by the members: (i) Research Workshops in specialized topics, (ii) Training Programmes for pre-PhD/ Ph D and young scholars, and (iii) Policy Roundtables involving senior bureaucrats and activists. In keeping with these priorities, the Society chose to organize the conference around a specific topic, and structure it in a way that would lead to both capacity building of young scholars and debates on policy issues.

The Conference has brought into sharp focus issues for research, education and public engagement around the theme of urbanization and the environment:

(i) **Research:** more conceptual clarity and evidence needed of causal relationships, the need for more data and better estimates of or indices of sustainability, and the importance of institutional/heterodox economics, sociological and political theories, as well as natural/ecological sciences in understanding these issues.

(ii) **Educational:** Questions of how we define variables and processes, scales of analysis and inter- and trans-disciplinary curricula are crucial in this research.

(iii) **Public engagement:** There is a greater need to engage with policy makers, investors and political actors, to build awareness for consumers and producers, and to work with the media to achieve these goals.



Figure 14 A rapt audience in the Conference

ACKNOWLEDGEMENTS

The Conference would not have been possible without the active support and contribution from a large number of individuals and organizations. The members of the Scientific Advisory Committee provided academic direction and helped in the reviewing of abstracts and extended summaries. The Keynote Speakers provided a brilliant synthesis of key dimensions of the conference theme. The conference delegates themselves made excellent presentations and engaged in vigorous debates through all the sessions.

The host institutions—IISc, ATREE and NIAS—provided the venue, accommodation for conference participants and also various other forms of in-kind support for the hosting of the conference. The members of the Local Organizing Committee worked very hard to ensure the effective and smooth organization of the event itself. They were ably supported by volunteers from Indian Institute of Science and ATREE.

Financial support for the conference was provided by the Indian Council for Social Science Research, Science & Engineering Research Board, Tata Trusts, Royal Norwegian Embassy, Rohini Nilekani and Canara Bank. Substantial support for the preparatory work of the conference was provided by the United Nations Environment Programme.

INSEE wishes thank all the above individuals and organizations for their support.

Appendix 1

Conference Programme THE INDIAN SOCIETY FOR ECOLOGICAL ECONOMICS (INSEE) EIGHTH BIENNIAL CONFERENCE URBANIZATION AND THE ENVIRONMENT

SUNDAY, 3 JANUARY 2016
DEPARTMENT OF MANAGEMENT STUDIES, INDIAN INSTITUTE OF SCIENCE (IISc),
BANGALORE

14:00 – 18:00	Field trip to Jakkur Lake (<i>Optional – by registration</i>) <i>Conducted by S Vishwanath, Biome Environmental Solutions</i>
19:00 – 19:30	Tea/Coffee
19:30 – 20:00	Meeting of the INSEE Eighth Biennial Conference Scientific Advisory Committee (SAC) and Local Organizing Committee (LOC)
20:00 – 21:00	Dinner
20:30 – 22:00	Meeting of the INSEE Executive Committee (EC)

MONDAY, 4 JANUARY 2016

06:15 – 07:45	Bird-watching walk on IISc campus(<i>Optional – by registration</i>) <i>Conducted by Ecology Students Society, IISc</i>
08:30	Conference registration

MONDAY, 4 JANUARY 2016
SATISH DHAWAN AUDITORIUM, IISc

INAUGURAL SESSION

09:30 – 11:00	Welcome remarks Prof H N Chanakya, Chairman, Centre for Sustainable Technologies, IISc
	Conference introduction Seema Purushothaman, Vice-President INSEE and Professor, Azim Premji University
	Presidential address <i>Engaging with urban environments: Challenges and opportunities for environmental researchers</i> Sharachchandra Lele, President INSEE and Senior Fellow and Convenor, Centre for Environment and Development, Ashoka Trust for Research in Ecology and the Environment (ATREE)
	Introducing keynote speaker Rajeswari Raina, Secretary INSEE and Scientist, National Institute of Science, Technology and Development Studies (NISTADS)

Inaugural address

Sustainable cities will be equitable and inclusive cities: How urban growth must be reinvented for sustainability and liveability in our world

Sunita Narain, Director General, Centre for Science and Environment (CSE)

11:00 – 11:30

High Tea

MONDAY, 4 JANUARY 2016
P1 – PARALLEL TECHNICAL SESSIONS

11:30– 13:00

Chair: Saudamini Das

Sweety Pandey

Rakesh Saxena

Bandana Khataniar

Mousami Prasad

P1 A: Urbanization, Industrialization and Climate Change

Venue: Seminar Hall, Centre for Sustainable Technologies

An Ecologic-Economic Analysis of Urbanization, Energy Consumption, Economic Growth and Environmental Quality in India

Urbanization and Environmental Performance across Indian States and Union Territories: A Regression Analysis

Impact of Urbanization on Energy Use and CO2 Emissions: A Cross-Country Analysis of Emerging Asian Countries

Investigating Firms' Response towards Environmental Sustainability in the Indian Context

11:30– 13:00

Chair: Rajeswari Raina

Sneha Thapliyal

Nibedita Dash

Chhavi Tiwari

P1 B: Culture, Consumption and Sustainability of Cities

Venue: Class Room, Department of Management Studies

Economic Sustainability of Urban India: Assessing the Inclusiveness of Household Consumption Expenditure (1983-2012)

Benchmarking Sustainability of Urban Mobility – An Indicator-based Approach

Measuring the Sustainability of a Heritage City Varanasi

11:30– 13:00

Chair: N C Narayanan

Kim Fortun

Amrita Ghatak

Ramya Swayamprakash

Neha Singh

P1 C: Urban Environmental Governance and Technology

Venue: Seminar Hall, Department of Management Studies

Critical Data Practice in Air Pollution Governance: New York City, Houston, Philadelphia, Albany, Beijing, Bengaluru

Environmental Regulations and Compliance: A Case of Textile Dyes Industry in Ahmedabad

Connected Cities, Disconnected Rivers: Analysing Urban Rivers in India

Understanding the Effect of Urbanization on Environment
A Case Study of River Knah (modern name Khan) in Indore City

11:30– 13:00

Chair: Veena Srinivasan

Sukanya Das

R K Amit

P1 D: Urban Water: from Source to Disposal

Venue: Satish Dhawan Auditorium

Evaluating Consumer's Preference for Wastewater Treatment: A Case Study of Tamil Nadu

Coping Strategies and Coping Costs for Accessing Safe Water in Chennai, India

Debanjana Dey	Disposal of Wastewater and the East-bound Growth of the City of Kolkata: A Compatibility Analysis
Neelam Rana	Community-Managed WasteWater Treatment Systems with Techno-economic Assessment
11:30– 13:00 <i>Chair:</i> Jagdish Krishnaswamy	P1 E: Air Pollution, Solid Waste and Human Health <i>Venue:</i> Annex Class Room, Satish Dhawan Auditorium
Priyanka Khati	Municipal Solid Waste Management in Kalimpong Town: An Economic Analysis
Gopal Krishna	Why Urban Waste Continues to Follow the Path of Least Resistance
Samraj Sahay	Impact of Urbanization and Solid Waste on Climate

13:00 – 14:00 **Lunch**

MONDAY, 4 JANUARY 2016
SATISH DHAWAN AUDITORIUM, IISC

14:00 – 15:30	Round Table Discussion 1 <i>Sustainable Consumption and Production in South Asian Cities: What? How?</i>
	<ul style="list-style-type: none"> • Sagar Dhara, Cerana Foundation, Hyderabad, India • Suren Erkman, University of Lausanne, Switzerland (<i>tbc</i>) • Atiq Rahman, Bangladesh Centre for Advanced Studies, Dhaka, Bangladesh • Madhav Badami, McGill School of Environment & School of Urban Planning, Montreal, Canada (<i>Moderator</i>)

Organized by INSEE with support from United Nations Environment Programme (UNEP)

15:30 – 16:00 **Tea/Coffee**

MONDAY, 4 JANUARY 2016
P2 – PARALLEL TECHNICAL SESSIONS

16:00 – 17:30 <i>Chair:</i> Gopi Rethinaraj	P2 A: Urbanization, Industrialization and Climate Change <i>Venue:</i> Seminar Hall, Centre for Sustainable Technologies
Asanka Wijesinghe	Deforestation and Income Growth in South Asia: An Evidence for Environmental Kuznets Curve
Rachna Yadav	Urbanization, Resource Use and Rise in Entropy: A Case Study of Guwahati City
Tamali Chakraborty	Urbanizing India through Special Economic Zones (SEZs) and Its Impact on the Surrounding Environment: Evidence from Mundra, Gujarat, India
Chhavi Tiwari	Benchmarking the Sustainability of Urbanizing India with special reference to Uttar Pradesh

16:00 – 17:30 <i>Chair:</i> Bejoy Thomas	P2 B: Culture, Consumption and Sustainability of Cities <i>Venue:</i> Class Room, Department of Management Studies
M Balasubramanian	Economics of Urban Ecosystem Services in Bangalore
T Syama Sundar	Leveraging Culture Towards Sustainability of Cities
Mihir Mathur	Modelling Economic Policies for Sustainable Consumption of Natural Resources: A System Dynamics Approach
<hr/>	
16:00 – 17:30 <i>Chair:</i> Seema Purushothaman	P2 C: Urban Commons, Institutions and Movements <i>Venue:</i> Seminar Hall, Department of Management Studies
Aditi Hastak	My Well, Our Water: Can Citizens Become Stewards of Groundwater?
Jenia Mukherjee	Commons vs. Commodity: Urban Environmentalisms and the Transforming Tale of the East Kolkata Wetlands
Aditi Singh	Fuelwood Dependents of Urban Forests: Odds Favour the Morning Walkers
Praveen Singh	The Struggle for Reclaiming the Urban Commons in Delhi
<hr/>	
16:00 – 17:30 <i>Chair:</i> Kalyan Das	P2 D: Urban Water: from Source to Disposal <i>Venue:</i> Satish Dhawan Auditorium
Indranil De	Local Self-governance, Ethnic Division in Slums and Preference for Water Supply Institutions in Kolkata, India
Sowmia Philip	Urbanisation and the Environment
Karthik Madhyastha	Water Governance in Small Towns: A Comparative Study of Small Towns in Karnataka and Tamil Nadu
Sharachchandra Lele	Potential for and Barriers to Decentralized Wastewater Recycling: Insights from Bangalore, India
<hr/>	
16:00 – 17:30 <i>Chair:</i> Indira P	P2 E: Rural in the Urban: Agriculture in Cities <i>Venue:</i> Annex Class Room, Satish Dhawan Auditorium
Mrutyunjaya Mishra	Health Cost of Wastewater Irrigation in Urban and Peri-Urban Agriculture: A Study of Varanasi
Jacob John	Terrace Gardens for Food Security in Urban Households – An Eco-Friendly Model from Kerala, India
Camille Frazier	“Grow What You Eat, Eat What You Grow”: Organic Terrace Gardening in Bengaluru

MONDAY, 4 JANUARY 2016
SATISH DHAWAN AUDITORIUM, IISC

18:00 – 19:30	Round Table Discussion 2 <i>From Ecological Economics to Ecology, Economy and Society: Engagements with Interdisciplinarity in Environmental Research</i>
	<ul style="list-style-type: none"> • Kanchan Chopra, Professor Emeritus, Former Director, Institute of Economic Growth, University of Delhi; Founding President of INSEE • Desmond McNeill, Head of Research and Director of Research School, Center for Development and the Environment, University of Oslo

- Arild Vatn, Professor, Department of International Environment and Development Studies, Norwegian University of Life Sciences (UMB); Former President of European Society for Ecological Economics
- Sharachchandra Lele, Senior Fellow & Convenor, Centre for Environment & Development, ATREE, Bangalore (*Moderator*)

Organized by ATREE, Bangalore

19:30 – 20:30 **INSEE Annual General Meeting**

20:30 – 21:30 **Dinner**

TUESDAY, 5 JANUARY 2016

06:15 – 7.45 Bird-watching walk on IISc campus(*Optional – by registration*)
Conducted by Ecology Students Society, IISc

TUESDAY, 5 JANUARY 2016
 SATISH DHAWAN AUDITORIUM, IISc

08:30 onwards **Photography Exhibition**
Living at the Margins of Bengaluru's Lakes: Untold Stories of Change, Loss and Hope

Photographs by Arati Kumar-Rao, Marthe Derkzen and Anoop Bhaskar
 Research study by Marthe Derkzen, VU University Amsterdam; Harini Nagendra and Seema Mundoli, Azim Premji University

09:30 – 11:00 **Introducing keynote speaker**
 Bejoy Thomas, Fellow, Centre for Environment and Development, ATREE

Keynote Speech
India's indispensable informal waste economy

Barbara Harriss-White, Emeritus Professor of Development Studies, Emeritus Fellow of Wolfson College, Oxford University and Visiting Professor at JNU

Introducing keynote speaker
 Shoibal Chakravarty, Assistant Professor, National Institute of Advanced Studies (NIAS)

Keynote Speech
Where do we start planning for better air quality in Indian cities?

Sarath Guttikunda, Director, UrbanEmissions.Info and Adjunct Associate Professor, Centre for Climate Studies, Indian Institute of Technology Bombay, Mumbai

11:00 – 11:30 **Tea / Coffee**

TUESDAY, 5 JANUARY 2016
 P3 – PARALLEL TECHNICAL SESSIONS

11:30– 13:00 **P3 A: Urbanization, Industrialization and Climate Change**
Chair: P Balachandra *Venue: Seminar Hall, Centre for Sustainable Technologies*

Apurba Kumar Das Urbanization and Thermal Environment of Guwahati City

Pleasa Serin Abraham	Willingness to Pay for Green-Rated Buildings in Bangalore
Rahul Mazumder	Impact of Development of Greenfield Airports on Environment and Urbanization
<hr/>	
11:30– 13:00	P3 B: Culture, Consumption and Sustainability of Cities
<i>Chair:</i> Madhav Badami	<i>Venue:</i> Class Room, Department of Management Studies
Hippu Salk Kristle Nathan	Urban Energy Poverty in India: A Household-level Analysis
Debalina Chakravarty	Sustainable Fuel Consumption of Urban Households
Bibhu Prasad Nayak	Harnessing Social Capital for Sustainable Cities: Community-Based Resource Pooling Transition to Cleaner and Modern Cooking Fuel among the Urban Poor
<hr/>	
11:30 – 13:00	P3 C: Urban Environmental Governance and Technology
<i>Chair:</i> Seema Purushothaman	<i>Venue:</i> Seminar Hall, Department of Management Studies
Binay Krishna Pal	Re-organizing Urban Space: Towards Sustainable Neighbourhood Transitions
Mukesh Lakum	Application of Socio-Technical Transition Theory to Understand Urban Sustainability in India
Mihir Mathur	Modelling Urban Carrying Capacity and Measuring Quality of Life Using System Dynamics
<hr/>	
11:30– 13:00	P3 D: Water for Growing Cities – the Impacts of Urbanization and Climate Change at the Watershed Scale
<i>Chair:</i> Gopal Kadekodi	<i>Venue:</i> Satish Dhawan Auditorium
Veena Srinivasan	The Transition from Water Scarcity to Water Pollution in Thippagondanahalli Halli Catchment, India
Vishal Narain	Conflicts, Cooperation and Peri-urban Water Security: Towards a Research Agenda for Emerging Indian Cities
Sebastian Vicuna	Challenges and Opportunities for Urban Water Adaptation Using a Basin Perspective: the Case of Santiago de Chile
<hr/>	
11:30– 13:00	P3 E: Urban Ecologies, Biodiversity
<i>Chair:</i> Haripriya Gundimeda	<i>Venue:</i> Annex Class Room, Satish Dhawan Auditorium
Hemantkumar Chouhan	Political Ecology of Natural Resource and Its Degradation, Power Relations, Marginalization of Small-Scale Fishing in Mumbai
Prajna Paramita Mishra	Visitors' Willingness to Pay for Lake Conservation: Evidence from Hyderabad
Malini Shetty	Assessment of Urban Green Space of Bangalore – A Comparative Study
Arsh Marwaha	Urban Ecology of Delhi: Relationship between Birds and Trees and Their Management
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13:00 – 14:00	Lunch
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TUESDAY, 5 JANUARY 2016 SATISH DHAWAN AUDITORIUM, IISC	
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14:00 – 15:30	Round Table Discussion 3 <i>Waste-full Cities: Ground-level Challenges and Research Questions</i>
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- N C Narayanan, Centre for Technology Alternative for Rural Areas, Indian Institute of Technology Bombay, Mumbai
- D T V Raghu Rama Swamy, Director and Professor at the School of Infrastructure, RICS School of Built Environment (RICS SBE), Amity University, New Delhi; formally CEO of the Infrastructure Development Corporation (Karnataka) Ltd
- Sasanka Velidandla, Chief Executive, CDD Society, Bangalore
- Shubhagato Dasgupta, Senior Fellow and Director of the Scaling City Institutions for India (Sci-Fi) Sanitation initiative, Centre for Policy Research (CPR), New Delhi (*Moderator*)

Organized by Centre for Policy Research (CPR), New Delhi

15:30 – 16:00 **Tea/Coffee**

TUESDAY, 5 JANUARY 2016
P4 – PARALLEL TECHNICAL SESSIONS

16:00 – 17:30 <i>Chair:</i> Saudamini Das	P4 A: Urbanization, Industrialization and Climate Change and Urban Environmental Governance and Technology <i>Venue:</i> Seminar Hall, Centre for Sustainable Technologies
Manu Mathai	Public Mobility: Enabling Steps for Human-Centered Low-Carbon Societies
Monoj Biswas	Introducing Cycling as a Tool for Smart Urban Growth (A Study of Khulna Metropolitan Area)

16:00 – 17:30 <i>Chair:</i> Ashish Kothari	P4 B: Culture, Consumption and Sustainability of Cities <i>Venue:</i> Class Room, Department of Management Studies
Snehashish Mitra	Urbanization and the Environment
Krishna Malakar	Understanding Adaptation Decisions in Urban Fishing Communities
Akshhaya Singghvi and Swati Sharma	A Cultural Paradigm for Sustainable Development of Cities

16:00 – 17:30 <i>Chair:</i> Kanchan Chopra	P4 C: Urban-Rural Environmental and Resource Linkages <i>Venue:</i> Seminar Hall, Department of Management Studies
Vijay Krishnan Kolinjivadi	Capabilities as Justice: Analysing the Acceptability of Payments for Ecosystem Services (PES) through ‘Social Multi-Criteria Evaluation’
Rupak Kumar	Flood Damage and Level of Urbanization: A District-Level Panel Data Investigation in Bihar, India
Ramachandra Bhatta	Urban Growth and Access to Coastal/Marine Resources along the Coastal Karnataka
Ismail Hossain	The Effect of Infrastructural Facilities Development on Efficiency of Primary Educational Institutions in Urban Areas

16:00 – 17:30 <i>Chair:</i> Desmond McNeill	P4 D: Regulating Industrial Water Pollution through Standards and Targets: Insights from India and China <i>Venue:</i> Satish Dhawan Auditorium
Priyanka Jamwal	Rethinking Irrigation Water Quality Standards in the Context of Urban Streams

Xuehua Zhang	State Planning and Water Pollution Control in China: Is It Sufficient to Improve China's Water Quality?
Jenny Gronwall	Tirupur's Journey and the Impact of 'Zero' Coming into Fashion
16:00 – 17:30 Chair: Partha Mukhopadhyay	P4 E: Air Pollution, Solid Waste and Human Health <i>Venue:Annex Class Room, Satish Dhawan Auditorium</i>
Hafiz Iqbal	Transformation of Waste into Energy in the Pabna Municipality Area of Bangladesh: An Economic Valuation
Somdutta Banerjee	Strategic Management of Household Waste and Local Government: A Cross-Country Analysis

TUESDAY, 5 JANUARY 2016
SATISH DHAWAN AUDITORIUM, IISc

18:00 – 19:30	Round Table Discussion 4 <i>Challenges in Urban Water Management</i> <ul style="list-style-type: none"> • K J Joy, Secretary, Society for Promoting Participative Ecosystem Management (SOPPECOM), Pune • M S Mohan Kumar, Professor, Department of Civil Engineering, IISc • Arvind Shrivastava, Secretary (Budget& Resources), Finance Department, Government of Karnataka • S Vishwanath, Director, Biome Environmental Solutions, Bangalore • Veena Srinivasan, Fellow, ATREE, Bangalore (<i>Moderator</i>) <p><i>Organized by INSEE with support from Rohini Nilekani</i></p>
19:30 – 20:30	Cultural Programme <i>Musical performance by Bhoomi Thaayi Balaga (Friends of Mother Earth)</i>
20:30 – 21:30	Dinner

WEDNESDAY, 6 JANUARY 2016

06:15 – 7.45	Bird-watching walk on IISc campus (<i>Optional – by registration</i>) <i>Conducted by Ecology Students Society, IISc</i>
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WEDNESDAY, 6 JANUARY 2016
SATISH DHAWAN AUDITORIUM, IISc

09:30 – 11:00	Round Table Discussion 5 <i>Resilient Cities and Transformative Adaptation</i> <ul style="list-style-type: none"> • G K Bhat, Chairman, Taru Leading Edge Pvt Ltd, Ahmedabad • Partha Mukhopadhyay, Senior Fellow, Centre for Policy Research, New Delhi
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- Sudhir Chella Rajan, Professor, Department of Humanities and Social Science, Indian Institute of Technology Madras, Chennai
 - Neha Sami, Consultant-Research, IIHS, Bangalore
 - Aromar Revi, Director, IIHS, Bangalore (Moderator)

Organized by Indian Institute for Human Settlements (IIHS), Bangalore

11:00 – 11:30

Tea / Coffee

WEDNESDAY, 6 JANUARY 2016
P5 – PARALLEL TECHNICAL SESSIONS

11:30– 13:00 <i>Chair:</i> Gopi Rethinaraj	P5 A: Urbanization, Industrialization and Climate Change <i>Venue: Seminar Hall, Centre for Sustainable Technologies</i>
Samraj Sahay	Dengue, Weather and Household Coping Strategies in Delhi
Chandra Sekhar Bahinipati	Flood-Induced Economic Loss and Damage to the Textile Industry in Surat City, India
Ulka Kelkar	Will India's "Smart" Cities Be Resilient to Climate Change?
11:30– 13:00 <i>Chair:</i> Suresh Babu	P5 B: Culture, Consumption and Sustainability of Cities and Air Pollution, Solid Waste and Human Health <i>Venue: Class Room, Department of Management Studies</i>
Vighnesh N V	E-waste Mitigation and Management in India: Synthesis of Stakeholders' Perspectives
Rama Mohan Turaga	Policy Instruments for Electronic Waste Management under Extended Producer Responsibility Framework: A Review and Lessons for India's e-Waste Rules
11:30– 13:00 <i>Chair:</i> Harini Nagendra	P5 C: Smart Cities, but for Whom? The Loss of the Commons and Urban Vulnerability <i>Venue: Seminar Hall, Department of Management Studies</i>
Sumit Vij	Land, Water and Power: The Demise of Common Property Resources in Peri-urban Gurgaon, India
Seema Mundoli	Commons That Provide: Multiple Uses and Vulnerabilities of Bengaluru's Urban Commons
D Parthasarathy	New Claims on the Coastal Commons: Contestation, Marginalization of Fishers and Fisher Spaces, and Environmental Degradation in the Mumbai Metropolitan Region
Ashish Kothari	Discussant
11:30– 13:00 <i>Chair:</i> K J Joy	P5 D: Urban Water: from Source to Disposal <i>Venue: Satish Dhawan Auditorium</i>
Durba Biswas	Patterns and Drivers of Household's Water Consumption in Coimbatore
Prasenjit Sarkhel	Fetching Pails of Water: Examining Households Choice of Drinking Water Sources in Urban India
Priti	Drinking Water in Urban India: A Study of Deficiency, Quality and Some Social Implications
Rahul Banerjee	Sustainability of Urban Water Supply and Sanitation in Dryland Areas – Case Study of Indore City
11:30– 13:00 <i>Chair:</i> Kalyan Das	P5 E: Urban-Rural Environmental and Resource Linkages <i>Venue: Annex Class Room, Satish Dhawan Auditorium</i>
Kaustav Raj Neupane	Changing Dynamics of Water Negotiation in Midhill Towns of Nepal: A Case from Dhulikhel
Neha Singh	Waterscape: Urban & Rural Reconfigured
S Balamurugan	Issues and Implications of Water Diversion from Rural to Urban Areas: A Case Study

Amarendra Pratap Singh Impact of Technology, Population and Urbanization on Cropland Expansion: Panel Data Evidence from Post-Green Revolution in Andhra Pradesh

13:00 – 14:00

Lunch

WEDNESDAY, 6 JANUARY 2016
SATISH DHAWAN AUDITORIUM, IISC

14:00 – 15:30

Round Table Discussion 6

Environmental Narratives: Urbanizing Environments and the Media

- Darryl D'Monte, Chairman Emeritus, Forum of Environmental Journalists in India (FEJI) and Founder President, International Federation of Environmental Journalists (IFEJ), Mumbai
- Ammu Joseph, Freelance journalist, media analyst and editorial consultant, Bangalore
- Ashish Kothari, Founder-member, Kalpavriksh, Pune
- Kalpana Sharma, Editorial Consultant, Economic and Political Weekly, and former Deputy Editor, The Hindu, Mumbai
- T V Padma, Science journalist, New Delhi (*Moderator*)

Organized by T V Padma in collaboration with INSEE

15:30 – 16:00

Tea/ Coffee

16:00 – 17:30

VALEDICTORY SESSION

Presentation of INSEE-NISTADS Award

For best student paper in the Symposium on Growth, Green Growth or Degrowth

Conference report

Rajeswari Raina, Secretary INSEE and Scientist NISTADS

Introducing valedictory speaker

Manu V Mathai, Assistant Professor, Azim Premji University

Valedictory address

Joan Martinez-Alier, Emeritus Professor, Universitat Autònoma de Barcelona and FLACSO, Ecuador

Acknowledgments

P Balachandra, Principal Research Scientist, Department of Management Studies & Centre for Sustainable Technologies, IISc

Appendix 2

8th BIENNIAL INSEE CONFERENCE URBANIZATION AND THE ENVIRONMENT

Scientific Advisory Committee

Name	Affiliation
1. Sharachchandra Lele (President & Chair)	Ashoka Trust for Research in Ecology and the Environment, Bangalore
2. Seema Purushothaman	Azim Premji University, Bangalore
3. Rajeswari Raina	National Institute of Science, Technology and Development Studies, Delhi
4. Kalyan Das	OKD Institute of Social Change & Development, Guwahati
5. Saudamini Das	Institute of Economic Growth, Delhi
6. Haripriya Gundimeda	Indian Institute of Technology, Bombay
7. Jagdish Krishnaswamy	Ashoka Trust for Research in Ecology and the Environment, Bangalore
8. K J Joy	SOPPECOM, Pune
9. Ashish Kothari	Kalpavriksh, Pune
10. N C Narayanan	Indian Institute of Technology, Bombay
11. Suresh Babu	Ambedkar University Delhi, Delhi
12. P Indira Devi	Kerala Agricultural University, Thrissur
13. P Balachandra	Indian Institute of Science, Bangalore
14. Joyashree Roy	Jadavpur University, Kolkata
15. Harini Nagendra	Azim Premji University, Bangalore
16. Bejoy Thomas	Ashoka Trust for Research in Ecology and the Environment, Bangalore
17. Partha Mukhopadhyay	Centre for Policy Research, Delhi
18. H N Chanakya	Indian Institute of Science, Bangalore
19. Madhav Badami	McGill University, Montreal
20. Veena Srinivasan	Ashoka Trust for Research in Ecology and the Environment, Bangalore

Appendix 3

8th BIENNIAL INSEE CONFERENCE URBANIZATION AND THE ENVIRONMENT

Local Organizing Committee

Name	Affiliation
1. Seema Purushothaman (Chair)	Azim Premji University
2. P Balachandra (Co-Chair)	Indian Institute of Science
3. M H Bala Subrahmanya	Indian Institute of Science
4. H N Chanakya, IISc	Indian Institute of Science
5. Manu Mathai	Azim Premji University
6. Bejoy K Thomas	Ashoka Trust for Research in Ecology and the Environment
7. Durba Biswas	Ashoka Trust for Research in Ecology and the Environment
8. Ulka Kelkar, ATREE	Ashoka Trust for Research in Ecology and the Environment
9. Shoibal Chakravarty, NIAS	National Institute of Advanced Studies
10. Sushil K Sen	INSEE Office, Delhi