Beyond Disasters in Chennai – Risk Management and Sustainable Urban Development

Workshop Report

Indo-German Centre for Sustainability,
IIT Madras

April 2016

SPONSORED BY THE

Indo-German Centre for Sustainability, IIT Madras
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This document is available at: www.igcs-chennai.org

Coordinators:
Dr. Franziska Steinbruch and Dr. Christoph Woiwode, IGCS Visiting Professors

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IGCS is grateful to Mr. Achim Fabig, Hon. Consul General, Chennai, for his initiative, support and the generous grant made available to conduct this programme. We also thank the panel moderators, rapporteurs, IGCS staff and scholars for their contributions and support.

Image: B Jothi Ramalingam

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Background and Objectives

Proposed Indo-German Public Panel Meeting on "Disaster risk management and socio-economic development under progressing urbanization and climate change"
Indo-German Centre for Sustainability
By Prof. Chella Rajan, Dr. Franziska Steinbruch, Dr. Christoph Woiwode

The recent monsoon period from mid-November to the first week of December 2015 resulted in widespread inundations and enormous human and economic losses in wide areas of Tamil Nadu, especially in the metropolis of Chennai. While previous floods had affected mostly those people living along river banks, this event became special, because of the ubiquitous nature of its impact.

A careful and holistic analysis of the flood event will be useful to plan and prepare for the future. Many lessons have been learnt from floods in India itself as well as in Germany and have triggered changes towards better disaster management, early warning systems and preventive measures such as river restorations. The impact of this flood however, on all social strata and any economic undertaking, suggests that an analysis of this event must include aspects outside the mere disaster risk management cycle. It must also include all aspects of water resources management, urbanization and development, and climate proofing.

We propose having a Public Panel Meeting with key stakeholders from government, business, community organisations and academia to discuss key elements of the flood and its response, with a view towards developing meaningful strategies for future action.

Expected outcomes
The outcomes of the panel meeting would be a short-term (6 month) research and action agenda. This could result in a series of white papers directed to the respective administrative authorities of the city of Chennai as well as the state of Tamil Nadu which shall assist these authorities to trigger or take legislative, juridical, or executive actions. An additional paper shall be directed towards the involvement and roles of the media.

Target audience and panel members
Residents living and earning their income from the metropolis of Chennai have observed the fast growth of the city and economy during the last years and can actively and valuably contribute to finding solutions towards disaster and climate change resilience from their own personal experiences. The youth will have to bear the ecological and thus economic system failures and consequences of today's development decisions and therefore should get engaged in decision-making processes as early as possible. The wealth of a metropolis like Chennai is widely resting on long-term migrant labor and resources drawn from the fringes of the expanding city. Both, migrants and (ex)-farmers play an important role in the economy and

ecology of the region as they harbor site and resource specific knowledge that could contribute to better decision-making. Specialists and experts including with a global exposure will be able to compile the various inputs from panel members and the audience to analyze and transform this into action-oriented white papers.

Figure 1: Dr. Christoph Woiwode on day 1 of the workshop

Figure 2: Dr. Franziska Steinbruch on day 2 of the workshop

Figure 3: Prof. Sudhir Chella Rajan at the opening ceremony

Programme and Methodology

The panel event was organised in Hotel Savera in Chennai to provide a neutral ground for discussions and flexible setting up of hall spaces as was required to implement the intended workshop methodology.

The methodology consisted of a combination of conventional lecture delivery, moderated panel-audience discussions on specialized topics, and an open space session in plenary. This allowed for ample interaction between experts from India and Germany as well as from various professional and local-knowledge backgrounds.

The workshop began with an opening ceremony lead by Dr. Christoph Woiwode as Master of Ceremony and was attended by H.E. Mr. Achim Fabig, Consul General of the Federal Republic of Germany, Chennai, Prof. Sudhir Chella Rajan, Professor, IIT Madras and Coordinator, IGCS, Prof. R. Nagarajan, Dean, International & Alumni Relations, IIT Madras, Dr. Mohan Kanda, I.A.S. (retd.), Prof. A. Kolar, Emeritus, IIT Madras, former IGCS Area Coordinator and panellists, moderators and participants for the various sessions that would take place on the first day.

The invited key speech was delivered by Dr. Mohan Kanda, I.A.S. (retd.) followed by opening remarks by Prof. R. Nagarajan, Prof. A. Kolar and Prof. Sudhir Chella Rajan.

Interactions and a first opportunity for self-introductions by the participants started with the screening of a documentary on the Food-Water-Energy (-Disaster) Nexus produced by one of the workshop participants in an Indo-German project.

Each panel began with an introduction by the moderator followed by opening comments from each of the panellists and then opened up for discussions to allow for ample exchange of ideas and thoughts between and among participants and panellists. The rapporteurs present took detailed notes and minutes of each of the session of which highlights were presented to inform the open session discussions on the second day.

Programme:

Venue: Savera Hotel, Chennai

7th April 2016

10:00 – 10:30 Registration

10:30 - 11:30 Opening Ceremony

11: 35– 12:00 High Tea

12:00 – 12:15 Introduction to the Programme

12:15 Film Screening "If not now, when? Planning for the urban water-energy-food nexus" (20 mins.), followed by a discussion.

13:00 – 14:00 Lunch

14:00 – 16:00

Parallel Sessions

Panel 1: Disaster risk management and climate change adaptation- "Relief measures serving as the next preventive measures or no risk, no life?" (Room: Santesh)

Moderator: Dr. William Gnanasekaran (IIT Madras)

Rapporteur: Kirthiga (EWRE) / Nitha (EWRE)

Panelists: Prof. Dr. Greiving (TU Dortmund), Prof. Elangovan (Anna University), Jay Anand (Consultant), Stephan Huppertz (Regional Coordinator Global Disaster Risk Management, GIZ Bangkok), J. Babu Rajendran (Special Projects, Greater Chennai Corporation)

- Introduction to disaster risk management cycle
- Disaster and climate change adaptation policies
- Early warning systems
- Prevention and building of resilience

Panel 2: Governance and the role of media – "An apathetic society, saturated scientists, an expecting youth – media and government as messengers?" (Room: Harappa)
Moderator: Dr. Milind Brahme (IIT Madras)

Rapporteur: Anisha Debbarman (HSS) / Arjun Bhargava

Panelists: Dr. Saraswathi (MCCI, Chennai), Dr. Uma Ramachandra (IFMR), Dr. V. Suresh (Barefoot Academy), Deepak Raj (Social Activist, Thozhamai)

- Accountability, integrity and transparency
- Communication as part of disaster risk management
- Public engagement and processes
- Knowledge, data and information in academic/ public institutions and individuals
- Roles and responsibilities of the corporate sector benefiting from megapolis

16:00 – 16:30 Tea/Coffee

8th April 2016

9:30 – 10:00 Tea/Coffee

10:00 – 12:00 Parallel Sessions

Panel 3: Development and urbanization – "Wealth and poverty, development or intact Nature, this or that OR BOTH?" (Room: Santesh)

Moderator: Dr. Karen Coelho

Rapporteur: Karl Beelen (IGCS)/ Gita Hermann (Goethe Institut Chennai)

Panellists: Garima Jain (IIHS, Bangalore), Prof. Dr. Greiving (TU Dortmund), Mrs. Ranga Rohini (ITDP, Chennai), Dr. R.R. Krishnamurthy (University of Madras), K.Sudhir (People's Architecture Commonweal)

- Sustainable versus parasitic urbanization models
- Land use changes, public land/goods and the up/down-grading of land
- Land developers and wealth
- Migrant labour and the urban poor
- Master plans, regulations and policies

Panel 4: Water Resources Management in urban areas – "Our future water imports and life in sewage?" (Room: Harappa)

Moderator: Dr. Indumathi Nambi (IIT Madras Uni Water Resources Centre Director)

Rapporteur: Kirthiga (EWRE) / Nitha (EWRE) (IGCS)

Panellists: Dr. Saravanan (Bonn University, Germany), Sekhar Raghavan (Director, Chennai Rain Centre), Arjun Arya (Head Research, Environment Foundation India), Roland Treitler (Project Coordinator, GIZ Bangkok), Dr. Daphne Keilmann-Gondhalekar (TU Munich), J. Babu Rajendran (Special Projects, Greater Chennai Corporation)

- Water supply and sewage cycles

- Water allocation, economic instruments and allocation priorities
- Water sources for urban areas
- Flood and drought mitigation in light of land use changes

12:00 – 14:00 Lunch

14:00 – 14:30 Panel Highlights - Reports by rapporteurs

14:30 – 16:00

Open Space Session

Moderators: Christoph Woiwode & Franziska Steinbruch

16:00 – 16 Valedictory Prof. B.S. Murty, IGCS Area Coordinator Water

9th April 2016

Fieldtrip to disaster-prone areas

9th April 2016 Departure

Introduction to panelists, moderators and rapporteurs

Moderators were chosen based on their knowledge in the respective field and in their experience in guiding professional discussions in an environment of diverse backgrounds and, as all of them had experienced the past floods themselves, emotionally-charged topics.

Each session had two rapporteurs ranging from their backgrounds from PhD and Postdoc students to professionals. Their roles was to record the minutes of each panel session, taking detailed notes, succinct briefs and highlights of which would later be presented to all participants prior to the open space discussions.

Panelists came from diverse backgrounds representing academic, professional sectors and civil society of Chennai. Participants from Germany added regional and global knowledge to the topics of interest.

Bios of moderators

Dr. William Gnanasekaran

Dr. William Gnanasekaran has been a guest faculty at the Department of Humanities and Social Sciences at IIT Madras since 2008. He also teaches in a similar role at the Indo – German Training Centre, Indo- German Chamber of Commerce. His areas of specialization include management studies (Human Resource Management (HRM), Management theories and Research methodology) and development studies (Development planning and project appraisal, Development theory and practice, NGOs and Project management and development administration). Prior to this, he was Professor and Head, Department of Public Administration at Madras Christian College.

Dr. Indumathi Nambi

Dr. Indumathi Nambi is Associate Professor and Head of the lab at the Environmental and Water Resources Engineering Division, Department of Civil Engineering, IIT Madras. Her research topics broadly include contaminant fate and transport of ground water, remediation of contaminated soil and ground water, water treatment, wastewater reuse and solid waste management. She has a Ph.D. in Civil and Environmental Engineering from Clarkson University and did her post-doctoral work in understanding bioremediation of petroleum and solvent contaminated aquifers using porescale micromodels at the University of Illinois at Urbana Chamapaign, US.

Dr. Karen Coelho

Dr. Karen Coelho is an urban anthropologist working as Assistant Professor at the Madras Institute of Development Studies (MIDS), Chennai. She focuses on reforms in municipal governance, informal labour, urban ecologies, and urban civil society. As Assistant Professor,

she teaches modules on History of Development Thought and Ethnographic and Qualitative Methods at MIDS. In 2013, she led a short study, commissioned by the Tamil Nadu State Planning Commission, on best practices in slum improvement at international, national (Indian) and local (Chennai) scales.

Dr. Milind Brahme

Dr. Milind Brahme is Associate Professor at the Department of Humanities and Social Sciences at IIT, Madras.

Bios of panelists

PANEL 1

Jay Anand (Consultant)

Mr. Jay Anand serves as a Research Consultant at Institute of Financial Management and Research (IFMR), Chennai, India. He has more than ten years of experience in the development sector and has worked on various issues related to Natural Resource Management, Climate change adaptation & mitigation, and Community Based Adaptation, both at the program and policy levels. He is currently leading a portfolio of projects related to vulnerability assessment, adaptation in water and agriculture, climate risk management training and capacity building. As a development practitioner, he has wide experience in evidence-based research in India and abroad at the nexus of water, agriculture and renewable energy. His research focus is on community based adaptation, vulnerability assessment, environmental governance and policy.

Prof. Dr. Greiving (TU Dortmund)

Dr. Stefan Greiving is Executive Director at the Institute of Spatial Planning (IRPUD), a joint research facility of the Department of Spatial Planning at TU Dortmund University. His work mainly focuses on legal and organisational impact potentials in spatial planning, spatial risk research, urban land use planning, regional governance and relationship between general spatial planning and specific planning tasks.

Prof. Elangovan (Anna University)

Elango Lakshmanan is a Professor in Geology at Anna University, Chennai, India with over 30 years of experience in the field of hydrogeology. He is the Vice President of International Association of Hydrological Sciences.

Stephan Huppertz (Regional Coordinator Global Disaster Risk Management, GIZ Bangkok)

Stephan Huppertz is the Regional Coordinator-Asia for the Management Unit of the Global Initiative on Disaster Risk Management (GIDRM). The GIDRM aims at facilitating knowledge-sharing, matching demands with smart solutions and strengthening resilience across regions. Countries involved are currently Bangladesh, China, India, Indonesia, Myanmar, Philippines and Thailand.

PANEL 2

Deepak Raj (Social Activist, Thozhamai)

Dr. Saraswathi (MCCI, Chennai)

Dr. K. Saraswathi is the Secretary General of the Madras Chamber of Commerce and Industry. She holds the distinction of being the first woman General Secretary of this historical Chamber.

Dr. Uma Ramachandra (IFMR)

Dr. Uma Ramachandran currently heads the focus area 'Environment and Climate Change' at the IFMR LEAD, a non-profit research organization based in India conducting high-quality scalable action research and outreach in development economics and finance. A doctorate in Ecology and Environmental Sciences, she has over 25 years of experience in the areas of Environment and Climate Change, Biodiversity Conservation, Natural Resource Management (NRM), Environmental Impact Assessment (EIA), Socio-economic studies and Poverty Reduction, with a few of them integrating gender concerns. She has worked in various roles with GIZ, M.S.Swaminathan Research Foundation (MSSRF) and Environment Protection & Training Research Institute (EPTRI), Hyderabad. She has also been invited to give lectures at the post-graduate level on environment management and sciences at both Anna University and Lund University.

Dr. V. Suresh (Barefoot Academy)

Dr. V. Suresh, is a practicing advocate in the Madras High Court. He is also working on Governance Reform through Change Management and Institutional Transformation. He has spent about 25 years working on human rights issues, including eight years of community organising in tribal areas. He is also appointed Advisor for Tamil Nadu to the Supreme Court Commissioner on Food Security and National General Secretary, People's Union for Civil Liberties. He is also founder Trustee for 'Barefoot Academy of Governance' which works on Institutional Transformation and Governance Reform.

PANEL 3

Dr. R.R. Krishnamurthy (University of Madras)

Dr. R.R. Krishnamurthy is Head of the Department of Applied Geology at University of Madras. He teaches and carries out inter-disciplinary research in the fields of Coastal Environmental Studies, Coastal Hazards and Disasters and Coastal Land Use/Land Cover Change (LUCC) Studies. His main areas of expertise are in the fields of Remote Sensing and GIS Applications.

Garima Jain (IIHS, Bangalore)

Garima is a Consultant at the Indian Institute for Human Settlements (IIHS). She works on the nexus of disaster risk reduction, climate change adaptation and human development. She is interested in the questions of urban poverty, migration and more recently on relocation in the context of disasters. She has been part of the Secretariat for the Sustainable Development Goals agenda for the cities (SDG 11), and has led several urban policy projects including those on disaster risk for UNISDR, urban poverty for UNDP and an urban policy support partnership with Rockefeller Foundation. Garima also serves on the Urban Planning Advisory Group to the Special Representative to the Secretary General of the United Nations.

Ranga Rohini (ITDP, Chennai)

Ranga Rohini is a Senior Associate - Urban Development at the Institute for Transportation & Development Policy. She provides technical support for ITDP's urban development programs. She has worked with multiple cities to analyse station areas to inform creation of transit-oriented Development Plans and regulations. She has been engaged in promoting ITDP's TOD Standard through workshops and stakeholder discussions, with a specific focus on creating better streets, public spaces and transit-supportive built-form. She has several publications on Principles of Transit-oriented Development, BRT Basics, parking Basics.

K. Sudhir (People’s Architecture Commonweal)

K. Sudhir is Principal Architect and Director at People’s Architecture Commonweal, a firm of architect-builders based in Chennai that seeks to provide solutions to the fragmented nature of operations in the building industry. He has been with the Commonweal since its inception in 1991 and has worked on projects involving rural and tribal households.

Prof. Dr. Greiving (TU Dortmund)

Dr. Stefan Greiving is Executive Director at the Institute of Spatial Planning (IRPUD), a joint research facility of the Department of Spatial Planning at TU Dortmund University. His work mainly focuses on legal and organisational impact potentials in spatial planning, spatial risk research, urban land use planning, regional governance and relationship between general spatial planning and specific planning tasks.

PANEL 4

Arjun Arya (Head Research, Environment Foundation India)

Arjun Arya is with the Environment Foundation of India, an organization comprising of passionate people who are focusing on real time, result oriented conservation efforts.

Dr. Daphne Keilmann-Gondhalekar (TU Munich)

Dr. Daphne Keilmann-Gondhalekar is currently carrying out research on integrated urban planning at the Technical University of Munich and was previously Senior Researcher at the Center for Development Research (ZEF) and studied the health impact of water access in urban Tibet. She has a PhD degree in Urban and Regional Planning from the Ecosystems Department at the University of Tokyo, Japan and was a Postdoctoral Associate at the Department of Urban Studies and Planning at Massachusetts Institute of Technology MIT, USA.

Dr. Saravanan (Bonn University, Germany)

Saravanan.V.S is Senior Researcher at the Department of Social and Cultural Change at the Center for Development Research (Zentrum für Entwicklungsforschung) at the University of Bonn, Germany. He has interdisciplinary qualifications from universities in India, United Kingdom and Australia. At ZEF, he leads the water and health research at the Center and a Research Working Group on 'Metabolism of Urban Water and its Health Implications' under the Water Science Alliance (WSA), Germany. He specializes on institutional analysis, systems approach, geo-statistical analysis, integrated water management, urban metabolism and socio-epidemiology to analyse urban water management and its implication on human health in rapidly growing economies. His regional focus is in South and Central Asia.

Roland Treitler (Project Coordinator, GIZ Bangkok)

Roland Treitler works as a project director with GIZ in Thailand on improved flood and drought prevention through ecosystem-based adaptation in watersheds in Thailand. In 2002, he switched from a career in the financial market to the research market and founded ExAqua Research Austria. His applied research on water efficiency was rewarded with a nomination for the Neptun Water price in 2007. He also conducted projects in water and environmental management, SME development for diverse organizations (World Bank, Austrian Development Agency, Eurasia Foundation, UNDP, GIZ) in several countries (Central Asia, Middle East, Africa) before he joined the German International Cooperation (GIZ) in 2011. From 2011 until 2013 Mr. Treitler was working in Kabul, Afghanistan and was responsible for the National Water Master Plan, which was elaborated with an Afghan team and Transboundary Management (TBM). Since August 2013 Mr. Treitler has been working in Thailand dealing with flood and drought management through the use of ecosystem services. The project has been highly successful. It changed the strategy of the most relevant water organizations from a traditional towards a more sustainable approach.

Sekhar Raghavan (Director, Chennai Rain Centre)

Sekhar Raghavan is a professor turned social entrepreneur who has motivated several Indians to preserve rain water for which he was eventually recognized as an Ashoka fellow. Dr. Raghavan did his PhD in theoretical physics from Madras University and went on to teach at the physics department for a period of six years. Working as a research fellow at the Centre for Policy Studies, Raghavan leant about traditional water harvesting preservation techniques. His modest attempt to preserve water began when he felt an excessive salt in the water in his locality of Besant Nagar. Over the years however, the Chennai Rain Centre has become a household name in this city and has educated the people of Chennai about applying filters to get clean water and it is known that Mr. Raghavan's efforts to conserve rain water helped Chennai overcome the low ground water level problems.

Participants List (including panelists)

No.	NAME	ORGANISATION
1	Kiranmayi Praparthi	BS Abdur Rahman University
2	Biswanath Dash	Birla Institute of Technology & Science (BITS) Hyderabad
3	Sanjeev Gupta	Central Leather Research Institute (CLRI)
4	Prithviraj Venkatapathy	Rajalakshmi Engineering College
5	Dr. Madhavi Ganesan	Anna University
6	Dr. K. Ganesan	University of Madras
7	Srinivasan Elumalai	Dr.M.G.R Educational and Research Institute
8	Prabhat Kamal Gupta	Shantiniketan Ashraya
9	Pradeep Chandra Bose	Anna University
10	Parimala Renganayaki	Anna University
11	Sandhya Chandrashekharan	Centre for Biodiversity Policy and Law (CEBPOL)
12	Antony Anbarasu	Water Resources Department, Govt. of Tamil Nadu
13	J. Babu Rajendran	Greater Chennai Corporation
14	Pavithra Sriram	Citizen consumer and civic Action Group (CAG)
15	Sumana Narayanan	CAG
16	Dhanamadhavan Saravanan	Anna University
17	Daniel Robinson	
18	Milind Brahme	Indian Institute of Technology, Madras (IITM)
19	Gita Hermann	Goethe Institut
20	Isabel Möhle	University Cologne
21	Prof. R.R. Krishnamurthy	University of Madras
22	L. Elango	Anna University
23	Garima Jain	Indian Institute of Human Settlement (IIHS)
24	Balchand Parayath	Chennai City Connect Foundation
25	Roland Treitler	GIZ Regional Office Asia
26	Stefan Greiving	TU Dortmund
27	Stephan Huppertz	GIZ – GIDRM, Regional Office Asia
28	Sudhir Chella Rajan	IITM

29	Vishnu Rau	CAG
30	Dr. William Gnanasekaran	IITM
31	Jay Anand	Institute for Financial Management and Research (IFMR)
32	K. Saraswathi	Madras Chamber of Commerce Industry (MCCI)
33	Kirthiga. S.M	IITM
34	Nitha Ayinippully Nalarajan	IITM
35	Vidhya V	IITM
36	Dr. Uma Ramachandran	IFMR-LEAD
37	K. Sudhir	Citizens Platform
38	Dr. K Ganesan	University of Madras
39	V. Suresh	Barefoot Academy of Governance
40	Karen Coelho	Madras Institute of Development Studies
41	Daphne Keilmann-Gondhalekar	TU Munich
42	Jocelyne Stahl	Goethe -Institut Chennai
43	V. S. Saravanan	ZFF University of Bonn
44	Sekhar Raghavan	Rain Centre
45	Indumathi Nambi	IITM
46	Balaji Narasimhan	IITM
47	G. Gowrisankar	Anna University
48	Raicy. M. C	Anna University
49	R. Ramyapriya	Anna University
50	Shreya Gadepalli	Institute for Transportation and Development Policy
51	Charu Govindam	Citizen Platform
52	V. Manivarnnan	Anna University
53	Dr. Arivudai Nambi	World Resources Institute
54	Avilash Roul	Indo German Centre for Sustainability

Panel sessions summary

Panel 1: Disaster risk management and climate change adaptation- "Relief measures serving as the next preventive measures or no risk, no life?" (Room: Santesh)

Moderator: Dr. William Gnanasekaran (IIT Madras)

Rapporteur: Kirthiga (EWRE) / Nitha (EWRE)

Panelists: Prof. Dr. Greiving (TU Dortmund), Prof. Elangovan (Anna University), Jay Anand (Consultant), Stephan Huppertz (Regional Coordinator Global Disaster Risk Management, GIZ Bangkok), J. Babu Rajendran (Special Projects, Greater Chennai Corporation)

- Introduction to disaster risk management cycle
- Disaster and climate change adaptation policies
- Early warning systems
- Prevention and building of resilience

Summary (by the rapporteurs)

i. Of the panellists' presentations:

1. Requirement of post flood auditing
2. Risk management measures being context specific
3. Need for inventory of susceptible land uses.
4. Green and open spaces in cities used for temporary storm water storage
5. Use of community radio being beneficial for information exchange
6. Involving private sectors in risk based investments

ii. Of the brainstorming session:

1. To have a concrete communication system during disasters
2. Supply of basic amenities such as food, shelter and milk to those affected, whether in multi-storied or in huts.

3. Forum of academicians, risk management consultants and NGO experts to meet in frequent intervals to discuss on risk management and remedy measures.
4. No - Regret measures
5. Preparing risk assessments (hazard exposures, vulnerability capacities to cope) graphically and made publicly available.
6. Clear and informed slum policies which are equitable and participatory, as these are the people almost always affected.
7. Mainstreaming of DRR into housing schemes (National programs and State programs like AMRUT, Smart cities , etc)
8. Mainstreaming development into DDR projects- socio-economic and environmental assessments.
9. Collaboration on EWS flash flood / landslide
10. The smart cities now to be developed should be kept in view of all disaster management.
11. Disaster management plans are need to be at various levels and need to be widely known if people are o respond and contribute effectively
12. Communication systems were down during floods, so how we need to plan for such a situation?
13. Circular pipes for storm water drain precast, junctions with infiltration
14. New apartments with storm water storage facility- tax rebate
15. Electricity meters placed above the maximum flood level (homes, transformers)
16. Walking mats able to produce power at home.
17. New areas being developed should keep in mind the learning from past floods. Points to consider include: street design, topological survey to know water flow patterns.
18. Strict zoning laws to be enforced.
19. Awareness before the occurrence of events through the media
20. An early warning system based on spatial hydrological model
21. Measures for water retention - new initiative.

22. Parallel Modelling Approach
23. Government should stop further encroachments at any cost, do desilting operations meticulously, storm water drains of greater Chennai with greater population should be redesigned and the disaster management authority should clearly define roles and create awareness
24. Public should cooperate with the government and implement measures.
25. Guiding volunteers and NGOs during and after disaster to help the affected.
26. Sensitizing the school and college students on climate and environment
27. Try to have control on development of metro cities.
28. Privatize most of the basic facilities.
29. Proper design of storm water drains and stopping the encroachment of surface water bodies
30. Risk management considering the climate change.
31. Changes in policies for future developmental activities in and around Chennai
32. Unmonitored development should not happen
33. Awareness to people on importance of water bodies, wet lands, proper disposal of garbage, so as to avoid using these habitats as waste disposal spaces and dump lands.
34. Increase citizen participation - devise village or panchayat level meetings incorporating people living in the area and the panchayat president regularly/ ward member / MLA regularly on the relevant issues of the place - so that the people are closely watching the actions of the elected representatives.

Panel 2: Governance and the role of media – "An apathetic society, saturated scientists, an expecting youth – media and government as messengers?" (Room: Harappa)
Moderator: Dr. Milind Brahme (IIT Madras)

Rapporteur: Anisha Debbarman (HSS) / Arjun Bhargava

Panelists: Dr. Saraswathi (MCCI, Chennai), Dr. Uma Ramachandra (IFMR), Dr. V. Suresh (Barefoot Academy), Deepak Raj (Social Activist, Thozhamai)

- Accountability, integrity and transparency
- Communication as part of disaster risk management
- Public engagement and processes
- Knowledge, data and information in academic/ public institutions and individuals

Roles and responsibilities of the corporate sector benefiting from megapolis

Summary (by the rapporteurs)

Our panelists provided a holistic global and local view on governance and the role of media. Panelists suggested that local, regional and state plans be aligned with the global development agenda, specifically, the sustainable development goals. This view calls for complete freedom of expression for the media.

The private sector is usually blamed for being responsible for pollution, unsustainable urban development, and causing an environmental imbalance. However, what people do not realize is that industry was affected by the recent floods and many companies are still recovering from the losses they incurred in December. Many companies have been unable to receive any compensation from insurance companies. Urbanization is seen to cause imbalances in Tamil Nadu is one of the most urbanized states in the country – so the real question panelists posed is whether we can do away without urbanization? The floods have caused an awakening in the private sector about our vulnerabilities. Initiatives such as the Chennai Sustainable Forum and on skill development did not receive a good response in 2010 and 2011 but could now gain more prominence by involving companies in discussions on energy, wastewater, water and other sustainability topics. The need to create a stable forum for engagement with locals, not just during a time of crisis, but also on broader stakeholder issues be conducted more regularly. The push for the CSR regulation to include natural disasters, and greater participation by the private sector in engaging with local residents and people in city planning processes were also highlighted.

Our panelists also linked the aspirations in international agreements and treaties, such as the Universal Declaration of Human Rights and the Millennium Declaration, with the urgent need for them to be realized in a local context. Strong and independent Media can be more unbiased and serve as a watchdog against corruption for society and be more inclusive in coverage of the poorest and marginalized. Unlike the Corporate sector, which also suffered greatly during the floods, the groups which suffered the most were individuals living in poverty, both in the rural and urban domain. Due to the lack of ownership to basic resources, and the incapableness of such groups to express their needs and grievances in an open forum, the poor were susceptible to greater damages than private sector bodies. Thus, it is not merely the ownership of resources which is essential for engaging with vulnerable groups.

Panelists also highlighted the importance of adopting traditional knowledge that our ancestors have gifted us, for example planting drought resistant paddy, which are tolerant to climatic changes and are capable of adapting to extreme weather patterns. Traditional/ Ancestral knowledge serve as a powerful alternative to modern technologies. They not only provide environmentally efficient techniques to cope

with climate change, but also prevent the alienation of local people. Panelists also highlighted examples of participatory democracy to identify problems, and one example was residents from South and North Chennai getting together to understand that oily food was blocking sewage in drains. Ordinary food was being thrown in drains, and in the course of questioning, they started to connect the dots and question our development. Another important point on governance was the access to decision-making for society, and areas such as inclusion, participation, equity and social justice should be the foundation for this. Panelists also warned about Chennai becoming a desert city if we do not break our pattern of silence.

Participants at our panel highlighted a sustainable and affordable urban development in Kelambakkam. The need for thinking and going beyond CMDA regulations and finding site-specific solutions, for example on technical considerations related to rainwater capture and groundwater recharge were highlighted. Corruption often leads to the mishandling of public funds for vested interests, thus leading to insufficient monetary funds for actual issues faced. But despite such issues, the panelists commended the proactive nature of today's youth, who came forward to help, engage and question the efficiency of society in handling crisis. Participants finally highlighted that scientific analysis should remain apolitical and bias free and the media should encourage the dissemination of bias free information.

Panel 3: Development and urbanization – "Wealth and poverty, development or intact Nature, this or that OR BOTH?" (Room: Santesh)

Moderator: Dr. Karen Coelho

Rapporteur: Karl Beelen (IGCS)/ Gita Hermann (Goethe Institut Chennai)

Panelists: Garima Jain (IIHS, Bangalore), Prof. Dr. Greiving (TU Dortmund), Mrs. Ranga Rohini (ITDP, Chennai), Dr. R.R. Krishnamurthy (University of Madras), K.Sudhir (People's Architecture Commonweal)

- Sustainable versus parasitic urbanization models
- Land use changes, public land/goods and the up/down-grading of land
- Land developers and wealth
- Migrant labour and the urban poor
- Master plans, regulations and policies

Summary (by the rapporteurs)

(1) Resilience - Resilience involves not just preparing for the calamities of yesterday, but also thinking about the (different, unknown) calamities of tomorrow. If risk and risk management are man-made, then 'risk' is neither a technological nor a technocratic debate. Instead, the trade-off between physical security and livelihood security should be the subject of a political and societal debate.

(2) Exposure to risk - The exposure to risk is differential, both in terms of the city's physical background and geography, as well as in terms of the risk's perception. Risk and its perception inform very different settlement choices across various groups and sections of society.

(3) Governmentality/subsidiarity - Two questions have loomed large throughout the discussion: one, does risk, does flooding, does urbanization at large urge for institutional reforms; that is, do they call for the re-reclamation of ground-level initiatives? And two, is risk an assignment to create more integrative, integral forms of planning?

Panel 4: Water Resources Management in urban areas – "Our future water imports and life in sewage?" (Room: Harappa)

Moderator: Dr. Indumathi Nambi (IIT Madras Water Resources Centre Director)

Rapporteur: Kirthiga (EWRE) / Nitha (EWRE) (IGCS)

Panelists: Dr. Saravanan (Bonn University, Germany), Sekhar Raghavan (Director, Chennai Rain Centre), Arjun Arya (Head Research, Environment Foundation India), Roland Treitler (Project Coordinator, GIZ Bangkok), Dr. Daphne Keilmann-Gondhalekar (TU Munich), J. Babu Rajendran (Special Projects, Greater Chennai Corporation)

Summary (by the rapporteurs):

1. Water supply and sewage cycles
2. Water allocation, economic instruments and allocation priorities
3. Water sources for urban areas
4. Flood and drought mitigation in light of land use changes
5. Requirement of Interdisciplinary Integrated Urban Planning approach, mainly involving the engineers, administrators and people.
6. Ensure local water supply from the local water bodies. A connect between the people and waterbodies should be ensured rather than compounding and isolating waterbodies.
7. Decentralisation of water supply services, the requirement of enforcing water metering and water tariff, third party monitoring and the mandatory imposition of rainwater harvesting.
8. Enforcement of planning actions should be made in view of long term purposes, rather than as fire-fighting approach.
9. Making use of ecosystem services for the water and waste water management.

Outcomes from Open Space Session

Discussions in the open space session took place in an open format wherein suggestions that were put forth by panelists and other participants in the panel sessions were broadly clubbed together under the following categories and opened up for general brainstorming, exchange of ideas and initiatives to be explored amongst participants.

1. "Research, studies and toolboxes"

Group: V.S. Saravanan, William Gnanasekaran, Stefan Greiving, R.Ramya Priya, Aneesha Debbarman

- Book toolkit for disaster preparedness
- Integrate disaster preparedness in planning policies
- Concrete communication at the time of disaster
- Assessment on physio-social impart at site-specific level
- Effect of urbanisation on rural areas and suburban regions

- Regional scale hydrological studies and their interaction should be used for large scale water management and plot-wise rainwater management

- Parallel modelling approach

- Create a network to share published and unpublished research data
- Evidence-based inventory of critical infrastructure such as hospitals, schools and public utilities in vulnerable areas

- Risk atlas made publicly available: Information in vulnerabilities, exposure and capabilities/resources, detailed environmental and socio-economic assessments done for all large-scale interventions made publicly available; regional, environmental/ecological planning and systems understanding

- Understanding the process of urbanisation, the role of legislative/institutional changes, demographic patterns and contextual failures (climate, migration, market)

- How to valuate alternative solutions?

Discussions/solutions at the table:
We need a necessary distinction between risk and vulnerability assessment. Risk Assessment, is based on past statistics on disasters but these cannot be used for future as a default standard.
It is wise to use land use patterns as an indicator of CC as this can determine heat patterns clearly.
A city like Chennai needs to use information which is already available from past documents to access the impacts of CC, before selecting appropriate and viable methodology to research the metropolis. Cadastral Maps of Land Records in Chennai to understand how land ownership originated in the city.

As a set of researchers, we need to formulate approaches to integrate risk profiles of areas. Another important measure to be included in the future is the possibility of building flood zoning methods.

Need to ensure better information on floods: Thus, there is a need to collect information from various departments. A multi-department approach.
An example of how Local Mitigation plans in Indonesia, derived from a community-based approach focused on adopting community based strategies.

Regional scale hydrological mapping systems to collect details on how this situation can be improved. However, we cannot assume that GIZ mapping of the affected areas as a solution and we need to suggest how to formulate a two-to three dimensional system.

As a suggestion, we can include pocket parks in each city quarter and these can be used to store storm water.
A parallel system for modelling socio-economic changes to assess future changes. As suggested by the IPCC report

2. "Policies"

Group: Kamal Prabhat Gupta, Garima Jain, Sumana Narayanan, Daphne Gondhalekar, Manivannan, Danamadhavn Saravanan

- Policies for giving priorities to natural resources in any urban planning
- NO- Regret measures
- Understand how policies are actually implemented (or) negotiated as they get implemented
- Accurate and timely auditing after a disaster event
- Use of low-cost technology solutions like dewats
- Enforcement of policies on land-use/water exploitation, efficient discharge
- Developed metrics which will monitor programs
- Control the construction
- Strictly maintain and follow the Government policies while constructing buildings
- Maintain proper drainage systems
- Multi-functional solutions

- Align local, state, regional plans with global development frameworks such as SDGs

- Prevent the loss of traditional knowledge and adapt it to contemporary problems

- Collaborate on EWS - flash flood/landslide

- How can change happen – Objective, better governance, better legislation, enforcements

In Indian context in my experience, change has happened when:

1) Committed bureaucrat/politician has been motivated – Surat, Orcha, golden quadrilateral, Delhi metro are examples
2) Politician has hinged his future – Industrialisation of Gujarat, Golden Quad – BJP; Anti-corruption – Arvind Kejriwal; Rain water harvesting – J Jayalalitha
3) Financial institutions have forced programs that lead to legislation, not necessarily enforcement (IMF CG Loans)

Government should:

1) Stop encroachment at any cost
2) Do desilting operations immediately
3) Greater Chennai with greater population – stormwater drains should be redesigned
4) Disaster management authority should clearly designation roles

Public should:

1) Co-operate with Government and implement
2) Avoid panic and do their part

- Monitor groundwater quality before/after floods

3. "Disaster Awareness"

(Group members' names not available)

- Dedicate half a page in the newspaper to research

- Communication systems were down during floods so how do we plan around such a situation? -
- Awareness before the occurrence of an event through "media"
- Use community radio to share early warning alerts and messages
- Monitor advances in early warning systems
- Guiding volunteers and NGO's during and after to help those affected

- Higher education in disaster management
- Sensitize the schools and college students on climate and environment
- Awareness to people on importance of water bodies, wet lands, proper disposal of garbage

- Awareness on financing for disaster risk reduction

- Disaster management plans should be at the various levels and need to be widely known if people are to respond and contribute effectively

- Risk management taking on board climate change

- The smart cities now being developed should be kept in view of disaster management - Changes in policies for future developmental activities in and around Chennai
- Try to have control on development of metro cities

- Privatise most of the basic facility

- Mark the highest level the water can reach as a lesson from previous floods

- Proper design of storm design and stop encroaching of surface water bodies
- New areas being developed should keep in mind learning from the last flooding; points to consider:
- Street design; topological survey to know water flow patterns; stricter zoning laws to be enforced

- An early warning system based on spatial hydrological model
- Rainfall prediction through metro-sat images, which id calibrated with local rain gauges
- The ALTM topography should be the base DEM
- A flood ground basin map for the predicted rainfall, published over TV on GIS maps
- Structural measure: Diversion channel from Adyar River's upper reaches to southern Palar River

4. "Technical solutions"
(Group members' names not available)

- Desilting the rivers
- Recharge structure is constructed for river by improving ground water quality and recharge

→ Change building regulation to restrict parking, improve the urban realm, and encourage creation of low income housing

- Measures for water retention – new initiatives?
- Recharge structures inside the river such as aquifer storage and recovery
- Circular pipes for storm water drains, precast junctions with infiltration
- Maintaining the existing rain water harvesting systems
- While we aim at rainwater harvesting and groundwater recharge with wastewater quality is of utmost importance; we have to ensure systems are in place to monitor quality and treat to adequate levels before recharge

- Collective date to be made available as open source data

- Low cost technological solutions like mud fridge for storing vegetables during flood events

- Use of public transportation to reduce accident risks as well as green eco-friendly options for reducing climate risks
- Circular pipes for storm water drains, precast junctions with infiltration

- New apartments with storage facility – tax rebate

- Electricity meters placed above flood levels (homes, transformers)
- Walking mats capable of producing power at home

- Sustainable urban drainage system should be made mandatory for all new development with source control, site control of regional control to reduce runoff
- A comprehensive solid waste management system
→ We have over 5000 Kms of roads but only about 1600 Kms of storm drains; we still need more than 4000 km of additional storm water drain
- Plans for waste segregation at source and make it mandatory
- Alternatives for plastic in everyday use

- Constructed wetlands (Artificial)

- Create multi-functional spaces in cities. For e.g.: basement spaces can serve as parking space as well as be designed to capture flood water

5. "Role of corporates and private sector"
(Group members' names not available)

- Promote MCCI Initiatives on including disasters as part of CSR regulation

- Advise companies on what is covered by insurance, especially on disaster and natural asset issues

- Conduct risk assessments for the corporate sector

- Highlight sustainability not just from a social perspective but also from an economic perspective – green products and solutions

- Build the capacity of Chennai Sustainable Forum and find ways to enhance interest amongst companies to join CSF

- Relate/link companies with SDGs

6. "Local participation and governance"

Group*: RK Krishnamurthy, Dr. Madhavi Ganesan, Gita Hermann, Sandhya Chandrasekharan, Joceleyn Stahl, Nitha AN, Pradeep. C, Christoph Woiwode

- Networking of local stakeholders for resource/knowledge sharing and effective communication
- Devolve power over local environments to local direct-democratic control

→ Form neighbourhood committees in urban areas as mandated by the 73rd amendment and empower them to determine uses of common resources in their neighbourhood under a larger common framework evolved for the urban environment

- Establishing local residents alliance for DRR
- Neighbourhood deliberative bodies – cross-class- with rights to participate in ward committee meetings

- Citizen participation – devise village or panchayat level meetings incorporating people living in the area and the panchayat president regularly on the relevant issues of the place, also so that people are closely watching the actions of the elected representatives

7. "A public forum or platform"

- A forum of volunteers to be formed by IGCS to communicate to the Government agencies like CMDA for proper implementation of plan execution for urban expansion
- Moving forward building synergies and in a sustained manner so that expertise informs governance/change on the ground

- How to convince decision makers to take long—term perspective on sustainability?

- Funding agencies like HUDCO should be roped in to ensure implementation of good plans/technology

- Develop an open space, forex, an open forum. Purpose to allow youth and residents to share their opinions

- A forum of academicians, risk management consultants and NGO experts to meet in frequent intervals to discuss on risk management and remedy measures
- Combined research of IIT, Anna University, SPC, NGO (no repetition of data and research)

- Does Chennai really need storm water drains? If so why not redesign as circular pipes?

- Debate on level of acceptable risk

- Integrated approach to water supply and sewage

- Let us move from “what should be done” to “what can be done”
- Continued engagement with Government agencies

* The same group of people convened over "A public forum or platform" and "local participation and governance" themes since they felt that they were complementary to each other. A list of members showed interest in taking some of the discussions forward and so shared email addresses. The list is with Sandhya Chandrasekharan (Way Forward Chennai member).

Press Release

The press release was carried by the German Consulate (Chennai) and IGCS websites.

09 April 2016

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Panel Discussion: "Beyond Disasters in Chennai – Risk Management and Sustainable Urban Development"

The 2015 rains resulted in widespread inundation and enormous human and economic losses in wide areas of Tamil Nadu, especially in the metropolis of Chennai. While previous floods had primarily affected those people living along river banks, this event wreaked devastation all over the city. Even though many lessons learned from floods have triggered changes towards better disaster management and early warning systems, as a witness to the tragic losses in Chennai, the German Consul General H.E. Achim Fabig supported a meeting with key German and Indian stakeholders from government, business, community and academia, with a vision to identify practical action steps to prevent such disasters, and develop sustainable strategies for future scenarios. Organized by the Indo-German Centre for Sustainability (IGCS) at IIT-Madras, the meeting was held on 7 and 8 April in Savera Hotel. A field trip was organized on 9 April to areas which were affected by the floods such as Chembarabakkam Lake.

"Since Chennai is recovering from the recent floods, our goal for the panel discussions was to help maintain the momentum towards making tangible recommendations to benefit the city," said visiting faculty at IGCS Dr. Franziska Steinbruch and Dr. Christoph Woiwode. The key note was delivered by Dr. Mohan Kanda (IAS, rtd.) and IGCS Area Coordinator Landuse. Experts from Indian and German academic and non-academic institutions like IIT Madras, Greater Chennai Municipal Corporation, TU Dortmund University (Germany), Anna University, Germany's development cooperation agency GIZ, TU Munich, Barefoot Academy, All India Disaster Mitigation Institute, Madras Chamber of Commerce and Industries, Indian Institute for Human Settlements, Institute for Transport and Development Policies, Bonn University, Environment Foundation India, and the Chennai Rain Centre shared their views and experience over four panels.

The first panel focused on disaster risk management and climate adaptation, and included discussions on disaster and climate change adaptation policies; early warning systems; and prevention and building of resilience. The second panel highlighted governance and the role of media, and specifically focused on communication as part of disaster risk management; roles and responsibilities of the corporate sector; and public engagement and processes. Another panel was a broader discussion on development and urbanization, with discussions on land developers and wealth; sustainable versus parasitic urbanization models; and land use changes. Water resources management in urban areas and sewage were the focus areas of another panel, and in-depth discussions on water supply and sewage cycles; water sources for urban areas; and flood and

drought mitigation in light of land use changes took place. The event ended with an innovative open space session where all participants identified and developed ideas to continue their work in collaborative projects to ensure sustained momentum on an issue of such significance. The open space session resulted in a number of themes that were identified by all the participants, including, research, studies and toolboxes; policies; disaster awareness; technical solutions; role of corporates and private sector; local participation and governance; and public forum/platform.

Photos

Photo1: Speaker: H.E. Mr. Achim Fabig, Consul General of the Federal Republic of Germany, Chennai addressing participants at the opening session. Seated from Left to Right: Prof. Sudhir Chella Rajan, Professor, IIT Madras and Coordinator, IGCS; Prof. R. Nagarajan, Dean, International & Alumni Relations, IIT Madras; Dr. Mohan Kanda, I.A.S. (retd.); and Prof. A. Kolar, Emeritus, IIT Madras, former IGCS Area Coordinator

Photo 2: Participants at the open space session

Photo 3: Participants at the open space session

Photo 4: Group photo of panelists and organisers