COOPERATION INDIA - THE NETHERLANDS

Sandpit on Urban Water Systems

27-30 November 2018

Maidens hotel, New Delhi

Netherlands Organisation for Scientific Research

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF SCIENCE & TECHNOLOGY

Content

Dear Sandpit participant

We are very pleased to warmly welcome you on behalf of the Department of Science and Technology (DST) and the Netherlands Organisation for Scientific Research (NWO) at the Sandpit on Urban Water Systems in Delhi. We are excited to work with you all in this highly collaborative and relatively new model for research development in which we will aim at innovative research ideas and new partnerships.

The Sandpit is part of the joint DST-NWO Call on Urban Water Systems. This call addresses the complex challenges to urban water systems that are faced by fast-growing cities resulting from population growth, rapid urbanisation and the effects of climate change. These processes place an immense strain on cities' water related infrastructures and services, including the wider sourcing areas. There is a need for an integrated systems approach in developing interrelated technological, institutional and financial solutions for sustainable urban water management. As part of the long-term India-NWO Cooperation programme, this call builds on the vast range of experience and the complementary strengths of Indian-Dutch research.

During the 4-day Sandpit, we will be working towards the joint development of an interdisciplinary Dutch-Indian research programme that aims to tackle these challenges. DST and NWO invite you to immerse in this collaborative process and use the creative, free-thinking environment to design a research programme that provides the synergy and integrated approach that is required. We hope that working with people from different disciplines, using their different perspectives and frameworks, will broaden your thinking. We encourage this workshop to further build networks that may result in opportunities for future research and partnerships in many different ways.

This booklet will provide you with more information about what and who to expect in the coming days. We look forward to excel in this intensive, but exciting journey together and to inspire you to innovative research ideas and fruitful professional friendships.

At the Sandpit

What distinguishes a Sandpit from the many workshops that build research proposals is that participation required you to arrive with an open mind, ready to explore the topic with other Sandpit Participants and TOGETHER generate exciting NEW ideas. *There will be no requirement to present any existing idea you may have.* This is a creative workshop where ideas will be co-created.

Truly interdisciplinary collaborations

You are very unlikely to come up with a new perspective/approach or something new and untested by connecting only with people who think like you or have similar experience to you. Seek out conversations with others who have different strengths to you and look for ways you can creatively link your skills. Discover what NL-India teams focused on an integrated urban water system in India can achieve.

Explore ways that you can combine what other sectors/individuals have to offer to create something really exciting and beyond your current thinking. Be open to the possibilities that others may offer to you.

Free thinking environment

No one in the room will know the answers and we hope to be amazed by the emergent ideas; if we feel during the event - '*wow, I wish I thought of that!*'- then we know we are getting somewhere good.

Frame of mind and attitude are critical to our success at the sandpit. We aim to create an environment where we can all indulge in free-thinking, unconstrained by convention. An ideal environment is one that promotes and sustains open, honest, trusting, challenging and fully supportive relationships. We need you to help us do this.

It is important to consider that everyone works at different speeds and intensity. If you need to have a one to one discussion with any of the organising team members to share concerns you have about the process or your ideas, then please do initiate this, it is not unusual.

Immersing structure and processes

Sandpits are intensive events that are extremely stimulating and challenging. They can be great fun and at the same time can be demanding. The results are often phenomenal, where collaboration engenders innovative thinking and new approaches for research.

Our working days are structured with each session on the agenda having a clear purpose. Whilst time is given for individual reflection for much of the day you will be engaged in group activities or in socialising with others. This socialising time is vital for the exciting ideas to emerge and be explored and developed. Allow time for this. If everyone is looking at their phones at every break time, then this socialising time is seriously compromised.

Organising team & roles

Alongside the other 29 Indian and Dutch participants working with you there is an Organising Team that is excited and privileged to be supporting you in achieving the Sandpit's mission.

Sandpit Agenda

Day 1 – connecting, exploring the challenge, levelling understanding

Time	Session	Purpose of the session
08.30		Coach leaves Grand Venizia Hotel where you will be staying
09.00	1	Register and participate in a welcoming networking activity once at the Sandpit Venue, the Maidens Hotel
09.30	2	Share and map professional expertise on the topic by participating in a structured yet informal introductions activity in small groups
10.00	3	Visit other groups expertise maps to further learn who is participating and what expertise they bring with them
10.30		Break and joined by our Stakeholders who will share their valuable insights in sessions 5, 6 & 7.1
10.50	4	A formal introduction to the Sandpit agenda, the theme and the funding criteria
11.30	5	Create a shared understanding of the urban water management system within India to recognise the different factors and how these interrelate and to assess the key stakeholders for subsequent engagement
13.00		Lunch
14.00	6	Explore the problems with the urban water system in India to deepen understanding of the context of the Sandpit (using the mentors suggestions for starting themes and involving the stakeholders)
15.00	7.1	Identify the long-term change (impact) that we will see if this topic is addressed well, gaining our stakeholders insights about what success means to them
16.00		Break and our last opportunity to speak with our Stakeholders before they leave
16.30	7.2	Reach a shared vision for the impact for the Sustainable Urban Water Management System Research Programme
18.00	8	Summary of Day 1
18.15		Close
19.00		Cocktail & Dinner at Maidens Hotel
21.00		Coach leaves Maidens Hotel to take you to your accommodation, the Grand Venizia Hotel

Day 2 – sharing perspectives, creating and consensus

TIME	SESSION	PURPOSE OF THE SESSION
08.15		Coach leaves your accommodation, the Grand Venizia Hotel for the Sandpit venue
08.45	9	Welcome to Day 2, to set context and expectations for the day
09.15	10	Define which actors are crucial and identify outcomes (what behaviour changes are needed to achieve the impact) for the Sustainable Urban Water System Programme
10.45		Break
11.00	11	Generate range of research outputs that will support the outcomes
12.15	12	Consolidate and reflect on what possibilities are emerging regarding possible Impact Pathways Reminder of the funding criteria
13.00		Lunch
14.00	13	Choose (max 3) Impact Pathways that have most potential to develop into proposals research programme funding
15.30		Break
16.00	14	Developing Programme contours, based on the three chosen Impact Pathways. Build the shape of each Programme by identifying main research areas and questions
18.00		Summary of Day 2
18.15		Close
19.30		Dinner at Maidens Hotel
20.30		Coach leaves Maidens Hotel to take you to your accommodation, the Grand Venezia Hotel

Day 3 – establishing and developing programmes, peer review

TIME	SESSION	PURPOSE OF THE SESSION
08.15		Coach leaves your accommodation, the Grand Venizia Hotel for the Sandpit venue
08.45	16	Welcome to Day 3, to set context and expectations for the day
09.15	17	Review Pathways and related Programme contours developed during Day 2 to sense check the direction the Sandpit Community are travelling. Pathways become more defined Programmes
09.30	18	Build on the work from day 2 to shape each programme further against the requirements in the funding call and identify work packages and leaders
11.15		Break
11.30	19	Develop each Programme to give them depth and demonstrate how the work packages integrate and plan how the team will collaborate with stakeholders
13.00		Lunch
14.00	20	Peer feedback to review the Programmes against the funding criteria
15.15		Break
15.30	21	Respond to the peer feedback within Programme teams
16.00	22	Complete Programme proposal outline format ready for submission (this is a summary document 3 page document which will be expanded for the full submission proposal after feedback on day 4, the participants will have been addressing the questions in draft format throughout the day)
20.00		Deadline to submit Programme proposal outline document and all to have dinner at Maidens Hotel
21.00		Coach leaves Maidens Hotel to take you to your accommodation, the Grand Venezia Hotel

Day 4 – presenting projects and creating project plans

TIME	SESSION	PURPOSE OF THE SESSION
08.15		Coach leaves your accommodation, the Grand Venizia Hotel for the Sandpit venue
08.45	23	Welcome to Day 3, to set context and expectations for the day
09.15	24	Prepare for presentations
10.30	25	Present and discuss proposals with the panel Prepare plan and make arrangements to develop and submit the full Programme proposal end January
12.30		Lunch Panel will discuss feedback
13.45	26	Summary presentations by the Programme teams and review of the week
14.45		Final words from DST and NWO
15.00		Sandpit Close and coach leaves for Grand Venizia Hotel

Sandpit participants

Name	Country	Research Organisation
Dr Soundharajan Bankaru Swamy	India	Amrita School of Engineering
Dr Pranab Kumar Mohapatra	India	Indian Institute of Technology Gandhinagar
Mr Deependra Sadasivan	India	Integrated Rural Technology Centre, Palakkad, Kerala, India
Dr Mona Iyer	India	CEPT University
Prof Mitthan Lal Kansal	India	IIT ROORKEE
Dr Puthenveedu Sadsivanpillai Harikumar	India	Centre for Water Resources Development and Management
Dr Sambuddha Misra	India	Indian Institute of Science
Dr Maneesha V Ramesh	India	Amrita Vishwa Vidyapeetham
Dr Manoj Kumar Tiwari	India	Indian Institute of Technology Kharagpur
Dr Vishal Narain	India	Management Development Institute
Prof Abdul Malik	India	Aligarh Muslim University, Dept. of Agricultural Microbiology
Dr Suchismita Satpathy	India	BITS-PILANI Hyderabad
Dr Pradip Kalbar	India	Indian Institute of Technology Bombay
Prof Manmohan Kapshe	India	Maulana Azad National Institute of Technology, Bhopal, India
Prof Rajiv Gupta	India	Birla Institute of Technology and Science Pilani
Dr Martijn Booij	NL	University of Twente, Dept. of Water Management
Dr Sander Oude Elberink	NL	University of Twente, Dept of Earth Observation Science
Dr Mohanasundar Radhakrishnan	NL	IHE Delft Institute for Water Education
Dr Esha Shah	NL	Wageningen University, Water Resource Management Group
Dr Sunil Tankha	NL	Erasmus University Rotterdam, Institute of Social Studies
Dr Saket Pande	NL	Delft University of Technology, Dept. of Water Management
Dr Katharina Hölscher	NL	Dutch Research Institute for Transitions (DRIFT)
Dr Ralph Lindeboom	NL	Delft University of Technology, Fac. of Civil Engineering and Geosciences
Dr Taneha K. Bacchin	NL	Delft University of Technology, Fac. of Architecture and the Built Environment
Dr Yoram Krozer	NL	University of Twente, Dept of Governance and Technology for Sustainability
Prof Kees van Leeuwen	NL	KWR Watercycle Research Institute, Utrecht University

Prof. Karin Pfeffer	NL	University of Twente, Dept of Urban and Regional Planning and Geo-Information Management
Mr Kees Bons MSc	NL	Deltares
Dr Bert Enserink	NL	Delft University of Technology, Dept. Multi-Actor Systems
Ms Ingeborg Krukkert, MA, MPH	NL	IRC WASH

Organising team

Name	**Role**	**Organisation**
Dr Sanjay Bajpai	Organiser/Funder	Department of Science & Technology, India (DST)
Dr Neelima Alam	Organiser/Funder	Department of Science & Technology, India (DST)
Ms Sonja Döpp	Organiser/Funder	Netherlands Organisation for Scientific Research (NWO)
Dr Lise de Jonge	Organiser/Funder	Netherlands Organisation for Scientific Research (NWO)
Ms Corinne Lamain	Organiser/Funder	Netherlands Organisation for Scientific Research (NWO)
Dr Berry Bonenkamp	Organiser/Funder	Netherlands Organisation for Scientific Research (NWO)
Prof Prajeem Mujumdar	Lead Mentor	Urban Water Systems International Advisory Committee
Prof Jurg Keller	Lead Mentor	Urban Water Systems International Advisory Committee
Prof Simin Davoudi	Mentor	Urban Water Systems International Advisory Committee
Prof Ashvani Gossain	Mentor	Urban Water Systems International Advisory Committee
Prof Isa Baud	Mentor	Urban Water Systems International Advisory Committee
Prof Rajan Rawal	Mentor	Urban Water Systems International Advisory Committee
Ms Christine Bell	Facilitator	Centre for Facilitation
Ms Lucy Brownsdon	Facilitator	Centre for Facilitation

Biographies

Participants

Dr Soundharajan Bankaru Swamy

Dr B Soundharajan is an Assistant Professor at Amrita Vishwa Vidyapeetham, Coimbatore and his expertise is in the analysis, planning and management of water resources systems to develop reservoir management and planning tools. He received his PhD in Water Resources Engineering at the Indian Institute of Technology Madras (2011) and moved to the UK to take up a post-doctoral position at Heriot-Watt University, Edinburgh, to work in a UK-India collaborative research project, funded by NERC (UK) and MoES (India). Dr Soundharajan also worked as a Scientist at International Water Management Institute (IWMI); and as Adjunct faculty at Washington State University, USA. His research focus also includes, understanding the climate change impacts on water resources availability and development of mitigation measures through operating policies for water supply reservoirs; developing optimal irrigation scheduling using crop simulation models.

Dr Pranab Kumar Mohapatra

Dr Pranab Kumar Mohapatra is a Professor in Civil Engineering at Indian Institute of Technology (IIT) Gandhinagar. His area of research is Dam/Levee breach flow, Flood wave propagation, Sediment transport, River training works, Transients in pipes and Frequency domain analysis in pipes. He uses both numerical and experimental model studies for his research. He did his PhD in Civil Engineering from IIT Kanpur. Earlier, he worked as faculty member at IIT Kanpur, IIT Madras and as a Scientist at National Institute of Hydrology at Roorkee. He also visited University of South Carolina, Columbia, USA and ETH, Zurich, Switzerland. He supervised four PhD students and more than twenty MTech students for their theses. He has published more than twentyresearch papers in reputed journals and more than thirty papers in conference proceedings. He has also published several book chapters, technical reports and lecture notes. He has been associated with several sponsored and consultancy research projects as Principal Investigator.

Mr Deependra Sadasivan MSc

He is currently working as a Consultant in the areas of Solid Waste Management, Sustainable Watershed Management, Natural Resource Management and Climate Smart Ecologically Sustainable Homestead and Agricultural activities. He has a Master's degree in Industrial Chemistry jointly awarded by Technical University of Munich, Germany and National University of Singapore, Singapore. He also has Master's degree in Chemistry with Environmental Chemistry as elective from University of Bhopal. His Bachelor's degree was in Industrial Chemistry with specialization in Waste Water Treatment.

His additional areas of interests are in Water Conservation Techniques - Roof Top Rain Water Harvesting, Rain Water Filter Design, Grey Water Treatment, Water Management Systems in Multitropic Agriculture Systems and Energy Conservation -

Hybrid Biogas Plant & Integrated Hybrid Cooking Stove. He liaisons with government organizations for preparation and implementation of projects.

He is monitoring projects in research institutes and NGO's. He is the Principal Investigator of a project which is under consideration with Department of Biotechnology, Gov. of India. His Concept Note on Ecologically Sustainable Homestead for lowering Carbon Footprint has been appreciated by NABARD and the concept would be jointly worked out for project funding under Climate Adaptation Fund. His Master's research work was published in Society of Petroleum Engineers (SPE).

DR MONA IYER

Dr Mona Iyer has over 18 years of experience in teaching, research, training and consultancy in water, sanitation and waste management sectors with focus on planning, policy and project development within public realm. Civil Engineer-Urban Planner by training, she has been recipient of prestigious British Chevening Fellowship for Environment Management, UK and Netherlands Fellowship Programme at (then) UNESCO-IHE, Institute for water education, Delft and holds a PhD in urban wastewater reuse policies. At CEPT, she teaches courses on urban water and sanitation, waste management, infrastructure project structuring and finance and has guided over 45 Masters' thesis and three independent studies of PhD candidates in water and Sanitation. Besides teaching and research she has been team leader for the preparation and appraisal of City Development Plans (CDPs), conducting training programs in urban infrastructure for chief officers of Municipalities of Gujarat state, Service level benchmarking pilots and city sanitation rating projects for MoUD and active team member of PAS (Performance Assessment System for water and Sanitation for 400+ Municipalities in India) now C-WAS at CEPT. She is a member of state and urban local body level water, sanitation and solid waste expert committees that advise on water, sanitation and waste management aspects.

PROF MITTHAN LAL KANSAL

Prof. Mitthan Lal Kansal, presently working as NEEPCO Chair Professor & Professor in the department of Water Resources Development & Management at Indian Institute of Technology (IIT) Roorkee (India). He is a Civil Engineering graduate with post-graduation in Water Resources Engineering. He obtained his Ph.D. from Delhi University. He also holds the Post Graduate Diploma in Operations Management. Previously, he served Delhi College of Engineering, Delhi, NIT Kurukshetra, IIT Delhi, NIH, Rookree at various levels. He has published about 150 research papers and has guided more than 100 students for Ph.D.s, M.Tech. dissertations, and B.Tech. projects. He has got best paper awards from Indian Building Congress, Indian Water Works Association, and received star performer award from IIT Roorkee. He received prestigious Visiting International Fellowship (VIF) award from EWRI of ASCE in year 2011. His areas of interest are : Rural and Urban Water Supply Schemes, Risk and Reliability Assessment of Water Resource Systems, River and Soil Health, Water Quality Modeling and Monitoring in Distribution Networks, Water Sustainability, Impact of Climate Change on Water Resources, GHGs Emission from Water-bodies, Minimum Flow Requirements, Hydropower System Planning, and Application of Operations Research in various areas of water resources engineering, etc.

DR PUTHENVEEDU SADSIVANPILLAI HARIKUMAR

Dr P S Harikumar is Senior Principal Scientist and Head of Water Quality Division in Centre for Water Resources Development and Management (CWRDM) Calicut. He received the PhD from Cochin University of Science and Technology (CUSAT) and did the post-doctoral studies in KTH Royal Institute of Technology, Stockholm, Sweden. His field of specialization include: Environmental Management, Water Quality Modelling, Water Treatment, Nanotechnology, Wetland Studies, and Urban Water Management.

Four scholars who worked with him received PhD and 5 scholars are presently doing PhD under him He has 45 journal papers to his credit and published 5 books. Dr Harikumar coordinated an Urban Renewal project viz. Integrated Development of Calicut City funded by UNDP through MATURE, TIFAC and DST. Carried out many projects funded by International, National and State agencies such as UNICEF, UNDP, Ministry of Drinking Water and Sanitation, MoEF, DST, INCID, State Council for Science Technology and Environment, Directorate of Environment and Climate Change etc. He had carried out research projects worth Rs 45 million. He has 45 journal papers to his credit and published 5 books

DR SAMBUDDHA MISRA

He was a member of State Environmental Expert Appraisal Committee and ood Safety Standards Authority of India. Presently he is a member of State Wetland Authority.

I am an assistant professor of Earth Sciences at the Indian Institute of Science. My primary research interest is to quantify the forces that control Earth's climate and seawater chemistry. My core expertise is in trace element and non-traditional stable isotope geochemistry of natural carbonates and water samples. A key aspect of my research is to study the spatio-temporal evolution of river water chemistry as a function of chemical weathering and reverse weathering reactions. I utilize the chemistry of riverine dissolved and suspended phases to quantify the rates of weathering, clay formation and dissolution, as well as red-ox and ion exchange reactions.

I completed my Bachelor of Science in Chemistry, and Master of Science in Oceanography from the University of Calcutta. My PhD is in Chemical Oceanography from Florida State University (2005–2010) with Prof. P. N. Froelich. Following which I did a postdoc at University of Cambridge (2011–2017) with Prof. Henry Elderfield. Since September 2017 I have been an Assistant Professor at the Indian Institute of Science. The analytical aspect of my PhD and Postdoc revolved around major and trace (Li to U) element geochemistry of carbonate and water samples as well as lithium, boron, magnesium, calcium, and strontium isotope ratio determinations.

DR MANEESHA V RAMESH

Dr Maneesha V Ramesh, Dean, International Programs and Director, Amrita Center for Wireless Networks & Applications, Amrita Vishwa Vidyapeetham. Managing a 100 crore initiative to provide clean drinking water to rural India. Contributed immensely in setting up a unique water distribution system in couple of villages. Collaborating with Universities across the globe to set up a virtual centre for "Water management for all spheres of life". Deployed the first wireless sensor network system for monitoring and real-time detection and early warning of landslides in Munnar, Kerala and Sikkim, India. Granted US patents "Network-based system for predicting landslides and providing early warnings", "Wearable Wireless Tongue Controlled Devices", "Mobile Infrastructure for Coastal Region Offshore Communications and Networks" to name a few. Won the NABARD award for rural Innovations, 2012. She is the Principal Investigator for several International projects, Her researches have contributed to several publications in highly recognised peer reviewed journals, and has been a frequent speaker in conferences worldwide. She is the drive behind Amrita's Live-in-Labs® program. Holds PhD in computer science, has successfully guided many PhD students, and has been an inspirational woman researcher who has broken barriers and has cut through the glass ceiling.

DR MANOJ KUMAR TIWARI

Dr Manaj Kumar Tiwari is presently working as Assistant Professor at the School of Water Resources at IIT Khargpur, which is one among the apex engineering institutions in India. He is a civil engineering graduate with specialization in environmental engineering and holds expertise in smart water supply systems, water quality management, wastewater treatment and recycling and contaminant fate and transport. His current research involve exploring system parameters, water loss and energy inter-relations in water distribution systems, simulation based real-time water loss detection, remote sensing based real time water quality assessment, water pricing and wastewater recycling. He has been actively engaged in international collaborations with researchers from US, UK, Australia, and Germany. Dr Tiwari has received several awards including prestigious Fulbright Fellowship in 2010, for which he worked at University of Virginia. Recently, he visited University of Melbourne as Invited Fellow in August 2018. Dr Tiwari has been associated with several project of National importance in India, including Future of Cities, Ganga Rejuvenation, National Programme on Technology Enhanced Learning (NPTEL), and Unnat Bharat Abhiyan 2.0 where he is co-coordinating Water Resources Group activities on National Scale.

DR VISHAL NARAIN

Vishal Narain, PhD is Professor of Public Policy and Governance at MDI, Management Development Institute, Gurgaon. He holds a PhD from Wageningen University, the Netherlands. His academic interests are in the inter-disciplinary analyses of public policy processes and institutions, water governance, periurban issues, gender, rights and equity issues in water access, and adaptation and vulnerability to environmental change.

He is the author of 'Public policy: a view from the South (2018, Cambridge University Press)' and 'Institutions, technology and water control: water users' associations and irrigation management reform in two large scale systems In India (Orient Longman, 2003'; for the latter he received the S R Sen Prize for the Best Book on Agricultural Economics and Rural Development (2002-03) conferred by the Indian Society for Agricultural

Economics. His current research focuses on the transformations in periurban spaces brought on by urbanization processes with special attention to issues of appropriation of land and water resources and their implications for issues of water access, rights and justice. He has been a consultant to several organizations such as the Food and Agriculture Organization of the United Nations, The Asia Foundation, SaciWATERs, the TERI School of Advanced Studies and the International Water Management Institute.

PROF. ABDUL MALIK

Abdul Malik is a Professor and Former Chairman, Department of Agricultural Microbiology, AMU Aligarh. He has been awarded several International fellowships, awards and honours including DBT CREST Award, DAAD fellowship (Germany), BOYSCAST fellowship, INSA-DFG, INSA-TUBA, and TUBITAK etc. Dr Malik spent one year as a Visiting Professor at the Albert Ludwigs University of Freiburg, Germany; worked on a project "GFP-based monitoring of plasmid transfer in anthropogenic contaminated European and Indian soils". He has successfully completed joint project with the TU, Berlin, Germany under DAAD-DST and with University of Minho, Portugal under DST-FCT programme. Prof. Malik has visited Cukurova University, Adana, Turkey under INSA-TUBA scientist exchange programme (2012) and recently invited as a visiting professor by the TUBITAK for three months (2018). He has also been awarded INSA-DFG fellowship to visit Beuth University of Applied Sciences, Berlin. Recently the British Council and the Government of India's Department of Science and Technology (DST-UKIERI, 2018) sanctioned a joint project to Prof. Malik, with Scotland's University of Strathclyde, Glasgow, to study the impact of industrialisation on the river Yamuna and Clyde river, Glasgow. His major areas of Research are Environmental Microbiology, and Ecotoxicology. He has edited eight books and published several research papers.

DR SUCHISMITA SATPATHY

I did my Ph.D. at the University of Hyderabad. I teach Urban Planning, Policy and Governance and supervise Ph.D. students with Urban Sociology as specialization. My research interest lies in the political economy of urban space, urban infrastructure and segregation, smart city, citizenship and the right to city etc. At BITS Hyderabad, I offer elective courses like Introduction to Globalization, Introduction to Anthropology and Dynamics of Social change. Earlier I taught at Tata Institute of Social Science, Hyderabad (as guest faculty) from June 2016 to April 2017, I was offering Urban Identities and Governance, Urban Planning and Policies optional papers and Understanding Society foundation course to MA students. As a part of a project of JBIC, I did survey on water supply and distribution in Bhubaneswar city during May- July 2007. At present I am working on a project to measure segregation in Hyderabad city and its relation with access to basic amenities.

DR PRADIP KALBAR

Dr Pradip Kalbar is an Assistant Professor at the Centre for Urban Science and Engineering (CUSE) in Indian Institute of Technology (IIT) Bombay. He was awarded Ph.D. from IIT Bombay and holds graduate and postgraduate degree in Environmental Engineering. His Ph.D. work focused on development of technology selection framework for wastewater treatment which received "Excellence in Ph.D. thesis" award from IIT Bombay. Prior to joining IIT Bombay as faculty, Prof. Kalbar received Marie Curie Fellowship for two-years to work as postdoctoral researcher at the Technical University of Denmark (DTU). He was with industry

before coming back to academia and worked on the designing and operation of drinking water supply schemes, sewage treatment plants and industrial effluents treatment plants. Dr Kalbar works in the interdisciplinary areas which include hydraulic modelling of water systems, GIS, technology assessment for wastewater treatment, Life Cycle Assessment, Material Flow Analysis, Multiple Criteria Decision Making, Circular Economy application to urban water systems, economic and social aspects of water and sanitation in urban areas. Dr Kalbar leads large scale research projects dealing with urban water, circular economy and sustainability assessment. Dr Kalbar has published several scientific papers in peer reviewed international journals and conferences.

PROF. MANMOHAN KAPSHE

Prof. Manmohan Kapshe is an Architect and Urban Planner. He is a Fellow of the Indian Institute of Management, Ahmedabad, India. He has more than twenty five years of teaching experience in Architecture, Planning, Energy and Management courses at various levels in different institutes.

Prof. Kapshe has done research and consultancy assignments with many national and international agencies. He has contributed and authored reports for Intergovernmental Panel on Climate Change (IPCC). He has authored two books, contributed chapters to various books and published a number of papers in national and international journals.

Prof. Kapshe is presently working as Professor in the Department of Architecture & Planning and Dean (Institutional Development) at Maulana Azad National Institute of Technology, Bhopal, India.

PROF. RAJIV GUPTA

Rajiv Gupta is Senior Professor of Civil Engineering, at BITS, Pilani. He has completed his B.E., M.E and Ph.D. from BITS, Pilani. In his last 30 years of teaching and research, he has published more than 150 research papers in peer reviewed journals and presented in conferences in India and abroad and authored a number of books and course development material. He has guided more than 10 Ph.D. scholars apart from being involved in teaching around 30 course, reviewed more than 125 books, project, and papers of reputed journals. His fields of interest are Water-Energy conservation, GIS and RS, Application of Artificial Intelligence, and Concrete Technology. He is involved in number of research and development projects worth more than Rs. 650 lacs of World Bank, UGC, DST, University of Virginia, and other sponsored organizations. Most of the projects (worth more than Rs. 500 lacs) are related with Water Management. He has implemented a multi sustainable Rainwater Scheme in 10 villages. He has also worked in different capacities of administration like Warden, Head of Department and Dean of Engineering Services and Hardware. He was instrumental in developing Goa, and Hyderabad campuses, apart from other different construction at Pilani campus.

DR MARTIJN BOOIJ

Martijn J. Booij is associate professor in Hydrology at the University of Twente, the Netherlands. He holds an MSc degree in Hydrology and Quantitative Water Management from Wageningen University and a PhD degree in Hydrology and Climatology from the University of Twente. His research interests and activities focus on catchment hydrology in general and modelling of hydrological systems, assessment of environmental change impacts on hydrology and water resources and uncertainty analysis in particular. These research themes are reflected in Booij's past and on-going research projects, international collaboration and over 100 scientific publications. He was and is involved in

projects and studies in many countries in the world including Indonesia, China, Vietnam, Pakistan, Iran, Rwanda, Kenya, Germany, France and Belgium. Booij teaches in the area of hydrology, hydrological modelling and water management and supervises PhD students, MSc theses and BSc theses. He has contributed to international training courses in Indonesia and China and provided guest lectures and keynotes in several countries (e.g. Pakistan, Thailand, Vietnam, Poland).

DR SANDER OUDE ELBERINK

Sander Oude Elberink graduated as Geodetic Engineer from Delft University of Technology in 2000. He gained working experience as researcher and project manager at the Survey Department of Rijkswaterstaat, part of the Ministry of Public Works and water management. In 2005 he took the opportunity to perform a PhD research on combining 3D point clouds with 2D topographic maps, executed at the University of Twente. The algorithms designed during his PhD were implemented at the Dutch Cadaster to produce a nationwide 3D topographic map. For this successful transfer of high quality and innovative research into practice, he has received the quadrennial ISPRS Giuseppi Inghilleri award in 2016. As assistant professor in the Department of Earth Observation, faculty ITC, University Twente, his research interest are (1) information extraction from airborne and terrestrial images and laser scanner data, and (2) 3D city and landscape modelling for different kind of applications. Dr Oude Elberink has written over 90 scientific publications, supervised over 50 MSc students, he is project leader of a NWO funded project, and currently supervisor of two PhD students and a PostDoc.

DR MOHANASUNDAR RADHAKRISHNAN

Dr Mohanasundar Radhakrishnan (Mohan) is an expert on Urban and climate adaptation planning processes. Mohan is currently researching on urban adaptation and resilience centred on flooding in Alexandria, Egypt and is the Project Coordinator of Anticipatory Flood Risk Management project (AFMA). He has a PhD on Flexibility on adaptation process to ascertain where, when and how to include flexibility in urban systems to increase the flood resilience of these systems. He has been a part of the team which prepared flexible adaptation pathways for Can Tho in Vietnam, Melbourne in Australia and is currently involved in the preparation a flood resilience plan for Alexandria in Egypt. Mohan has about five years of experience in design and implementation of urban water systems in India; three years in coordinating and managing integrated urban water management projects and city sanitation projects in India. He has also worked as Water and sanitation field expert with Doctors without borders. I have an MSc degree in "Municipal Water and Infrastructure systems" from IHE Delft and a Bachelor's degree in Civil engineering from University of Madras.

DR ESHA SHAH

Esha Shah is an engineer by training and anthropologist, philosopher and historian of science and technology by professional choice and self-learning. Since her doctorate from Wageningen University in the Netherlands, she has worked on history and anthropology of water management technologies, GMOs, green revolution in India on the divide of modernity and democracy. She has a number of other research interests including, more recently, on the way human subjectivity relate to modes of rationality. She has held research and teaching positions at the Institute of Social and Economic Change (ISEC) in Bangalore, Institute of Development Studies (IDS) at University of Sussex, UK, and Faculty of Arts and Social Sciences at Maastricht University, the Netherlands. Between 2013 and 2015 she was a fellow at the Indian Institute of Advanced Study in Shimla. Since January 2017 she is working as Assistant Professor with the Water Resource Management Group, department of Environmental Sciences at Wageningen University in the Netherlands. In between for 9 months, between October 2017 and October 2018, she was a fellow with the Nantes Institute of Advanced Study in Nantes, France. She has recently published (May 2018, Routledge London) a monograph on history of subjectivity and objectivity in genetic science during the twentieth century.

DR SUNIL TANKHA

Sunil Tankha grew up in India and left for the United States when he was ready for college. After obtaining a Masters in Public Affairs from the University of Texas at Austin, he became a Research Associate at the Houston Advanced Research Center and worked on improving the management of large water infrastructure projects. In 1999, he enrolled in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology and obtained a doctorate in Economic Development in 2006. While at MIT, he coordinated the UN-World Bank research program on Good Governance in Water and Sanitation in South Asia. His doctoral research on economic policy reforms took him to Brazil where he lived between 2002 and 2005, during which time he wrote on privatization policy in the electric power industry. Shortly before obtaining his doctorate, he moved to the Netherlands for a faculty position in Public Policy and Management at the Institute of Social Studies of Erasmus University Rotterdam. His recent research has focused on institutions and climate change, including at the intersection of water and energy policies and management. He speaks seven languages and is currently learning an eighth. In his spare time he climbs mountains.

DR SAKET PANDE

Saket Pande is a hydrologist and water economist at TU Delft, Netherlands. He has Bachelor of Technology degree from Indian Institute of Technology Delhi, India (2000) and Ph.D. from Utah State University, USA (2005), both in in Civil and Environmental Engineering. Prior to joining TU Delft, he worked as a resource economist at Center for World Food Studies of VU University (SOW-VU) Amsterdam, Netherlands for four years and been visiting fellows at UN World Water Assessment Program, Italy and University of Technology Sydney, Australia. Saket Pande's project experience include assessment of impacts of climate change on agriculture and health in Benin, anthropogenic influence (grazing) on land degradation and water resource availability in Ethiopia and assimilation and harmonisation of data sets from variety of sources and scales using a software that he co-developed. At Delft University of Technology, he is involved with the 2030 Sustainable Development Agenda of the United Nations and is investigating aspects of coupled human-water systems such as adoption of household water treatment systems, links between population growth and water scarcity, behavior of smallholder farming in India, valuation of water in Indian and Lebanese basins, and coupled system modeling of rural-urban migration in Jiangsu province of China.

DR KATHARINA HÖLSCHER

Katharina Hölscher works since 2014 as a researcher at the Dutch Research Institute for Transitions (DRIFT) at the Erasmus University in Rotterdam, The Netherlands. Her academic background encompasses Environmental Governance (MSc; Utrecht University) and European Studies (BA; University of Passau and University of St. Petersburg), including the study of political systems, governance arrangements, policy analysis and cultural studies. Katharina is engaged in practice-oriented, inter- and transdisciplinary research and consultancy projects related to the governance of sustainability transitions, transition management, climate governance and cities. Her PhD thesis conceptualises, explains and evaluates capacities for transformative climate governance in cities. She has experience in various European and German research projects. In the EU FP7 project IMPRESSIONS she has contributed to the advancement of transition management to co-create with stakeholders transformative and robust climate mitigation and adaptation pathways in local, regional and European-level case studies. In the project TRAFIS, funded by the German Environment Agency, she worked on questions related to transformations towards sustainable and resilient infrastructures. Katharina has also worked to conceptually and methodologically expand and evaluate transition management as a participatory process framework to support sustainability transitions in practice.

DR RALPH LINDEBOOM

When seeing the major pollution of the rivers in India in 2004, I decided to use my studies on Innovation management and Renewable energy for treating Water. Afterwards I ended up working for Kiwa Industry and Water, did my PhD at Wageningen University on Autogenerative High Pressure Digestion and worked as lecturer and researcher at Saxion Hogeschool on various energy and water related themes. Prior to my current position I was working as a post-doc at Ghent University in co-operation with the European Space Agency to build, operate and evaluate a pilot installation recovering hygienic water and nutrients from urine and shower water for long term manned Space missions. Here I was the first on the planet to send and revive amongst others Anammox-bacteria after Space exposure.

In my current tenure-track position Cyclical LOcal Sanitary engineering Solutions in Urban and Rural Environment (CLOSeSURE) I aim to tackle global challenges and use frugal innovation to convert high-tech Space solutions into low-tech autarkic watertreatment systems and recover water and value-added byproducts. With a focus on local resources, integrating solar energy and autogenerative pressurised digestion into biological waste water treatment systems is an obvious choice given my background in both and prevailing local conditions. Currently, I am heavily involved in the LOTUS^{HR}, in which we target this same approach at the Barapullah drain in New Delhi.

DR TANEHA K. BACCHIN

Taneha K. Bacchin is an architect, researcher and educator specialized in the field of Landscape Urbanism. Assistant Professor Section Urban Design and Research Program Leader/ Coordinator of Education Delta Urbanism Interdisciplinary Research Program — Faculty of Architecture and the Built Environment, Delft University of Technology.

She holds a PhD (double degree) in Landscape Architecture and Water Science & Engineering from Delft University of Technology jointly with UNESCO-IHE; an Advanced Master Degree in Spatial Planning, GIS & RS, a Master Degree in Architecture from IUAV University of Venice, Italy; and a Dipl.Arch. from University of Brasilia, Brazil. Before starting her academic carrier, she worked for architecture and urban planning practices in Brazil, Italy and Denmark.

Her research and projects focus on the relationship between landscape architecture and urban form, environment, territory and economy. She has expertise in water (sensitive) design, engineering and planning. Her current work deals with infrastructure and environment under extreme weather and resource scarcity, exploring the notion of cultivation and the architecture of regional land/waterscapes as a novel approach to infrastructure and public works. As environmental/ water researcher, she has been invited to teach at UNESCO-IHE, Erasmus Intensive Delta Cities Program, University of São Paulo, Vrije Universiteit Brussel, Luleå University of Technology, UC Berkeley, Dalhousie Canada.

DR YORAM KROZER

Yoram Krozer (1953) received a MsC in biology and MA in Economics at the University of Utrecht, Business Administration at InHolland, and PhD in Economics at the University of Groningen. His work started at non-governmental organisations, then shifted to industries, and he directed the Institute for Applied Environmental Economics - TME. After thirty years in the private sector he joined the University of Twente as director of the Cartesius Institute, Institute for Sustainable Innovations of the Netherlands Technical University. He is now associated professor at the CSTM at the University of Twente, professor at the Jyothi Institute of Technology, Honorary Fellow at the Melbourne University and Director of the Sustainable Innovations Academy. His work on the economics of sustainable development covers products, software, masters and vocational courses, about hundred papers and two books "Innovations and the Environment" and "Theories and Practices on Innovations for Sustainable Development".

PROF. KEES VAN LEEUWEN

Cornelis Johannes (Kees) van Leeuwen holds a position as Principal Scientist at KWR Watercycle Research Institute and Professor of Water Management and Urban Development at the Copernicus Institute for Sustainable Development and Innovation at Utrecht University (UU) in the Netherlands.

His research focus is sustainable urban water management & risk assessment of (drinking) water contaminants. He has a background in Biology (MSC, 1980, cum laude) and a PhD in Toxicology (UU, 1986). He worked at the European Commission as Director at the Joint Research Centre (JRC) in Italy. From 1992-2007 he held a part-time professorship in Biological Toxicology (environmental risk assessment) at the UU. Between 1980 and 2001 he worked in three Dutch Ministries on water, chemicals, health and the environment. Kees is experienced in managing complex multi-stakeholder processes in the science-policy interface on areas of chemicals, health and the environment and has a track-record of putting science into regulatory practice. Currently he coordinates the City Blueprint Action Group of the European Innovation Partnership on Water.

Specialties: urban water management, risk assessment and management of chemicals and pesticides, chemicals legislation (REACH), health and environment, biodiversity and ecosystem services, water pollution, external science advisory boards, coaching, training and capacity building (e.g. UNITAR). Kees has published more than 200 reports, publications and book chapters and edited two editions (1995 and 2007) of the book: Risk Assessment of Chemicals. An Introduction.

PROF KARIN PFEFFER

I am a Full Professor of Infrastructuring Urban Futures at ITC, University of Twente. I am a geographer and have obtained my PhD degree in Physical Geography from Utrecht University, the NL, in 2003. Since then I worked in the Social Sciences domain at the University of Amsterdam, the NL, prior to my current appointment as Full Professor at ITC in 2017. Central to my work is the use and analysis of geographic information science technologies for investigating critical urban issues such as deprived settlements (India) or water vulnerabilities (Peru). I investigate how research can engage with, and participate in, the development of new urban planning practices and address issues of urban sustainability. Key questions are how urban governance actors develop, organize and practice access to urban infrastructure and how geo-spatial technologies can enhance the planning of and access to urban infrastructures. I have participated in several NWO and EU-funded research programmes among which the NWO-WOTRO IP on 'Using spatial information infrastructure in urban governance networks: reducing urban deprivations in Indian cities'. Currently, I am Co-PI of the JPI Urban Europe Project Codaloop on behavioural change in energy demands, and the Dynaslum project (Netherlands eScience Center) on deprived settlement dynamics.

DRS KEES BONS

Kees Bons is an experienced water manager who can rely on a sound background in earth sciences (BSc Free University Amsterdam) and hydrology (MSc Free University Amsterdam). His research experience in both surface and groundwater hydrology forms a good foundation for the integral approach to solving water management problems, which has been his key occupation for many years. Mr. Bons has been involved in the design, set-up and implementation of IWRM projects for several large river basins in Europe, Egypt, Indonesia and India.

Between 2003 and 2012 he became involved in the management of Deltares, first as director of the Unit Inland Water systems, the Unit Scenarios and Policy Analysis (2008) and the Unit Subsurface and Groundwater Systems (2010). In 2012 Mr. Bons moved to Jakarta, Indonesia as Deltares representative in Indonesia and specialist advisor for the S.E.Asia region. Key projects Mr. Bons worked on are the National Water Resources Plan for Egypt, the Jakarta Coastal Development Strategy and the Country Water Assessment for Indonesia, and in India the Strategic Basin Planning in the Ganges River Basin in India, for which he was stationed in Delhi from 2015 till the end of 2017.

DR BERT ENSERINK

Bert Enserink is associate professor policy analysis at Delft University of Technology. He is the director of studies of the international and interdisciplinary master program on Engineering and Policy Analysis in The Hague. He teaches courses on multi-actor systems analysis, intercultural communication and research methods both for bachelor and master students. He was one of the early adaptors of open, online and blended education at TUDelft.

Enserink was trained as a country planning consultant and holds an MSc from Wageningen University and a PhD in the Philosophy of Science from Twente University (The Netherlands).

His main areas of expertise are in the field of public participation and social learning, rapid appraisal and scenario techniques. Main fields of application are in natural resources management, urbanization, coastal zone and river-basin management. He has extensive international experience in India, China and South Africa and participated in Dutch and EU funded (evaluation) projects on public participation in river basin management in Europe. In India het co-developed the visual problem appraisal technique resulting in the VPA Kerala's Coast. Lately he has been engaged in developing scenarios for the international cooperation in the Nile Basin and in research on city-harbor relations in Durban, South Africa.

MS INGEBORG KRUKKERT, MA, MPH

Ingeborg has 20 years of international development experience, of which 16 in WASH. She has been leading the Asia and India Country Programme at IRC with a specific focus on sanitation and hygiene. She worked with the BRAC WASH team on behaviour change: designed innovative and interactive behaviour change guidelines for hygiene promotion and materials for over 8000 field staff focusing on interactive ''social marketing" communication skills called "from telling to selling"; and developed a monitoring framework to measure behaviour change. Recently, most of her work is on district-wide approaches related to wash-systems change in Africa; on urban sanitation in India and waste to energy Bangladesh; and on empowering citizens and civil society organisations in India and Bangladesh to lobby and advocate at the Government for WASH and IWRM. She has a Post Graduate Diploma in Public Health from the London School of Hygiene and Tropical Medicine, an MA in Anthropology, BA in Psychology and training in information technology.

Mentors

PROF P. P. MUJUMDAR (LEAD MENTOR)

Prof. P P Mujumdar is currently serving as a Professor in the Department of Civil Engineering and as Chairman, Interdisciplinary Centre for Water Research (http://icwar.iisc.ernet.in/) at the Indian Institute of Science, Bangalore. His area of specialization is Water Resource Systems with a focus on climate change impacts, statistical downscaling of GCM outputs, urban flooding, planning and operation of water resources systems, and uncertainty modeling.

Prof. Mujumdar is a recipient of the Alexander von Humboldt Medal of the European Geosciences Union (EGU) and the Distinguished Visiting Fellowship of the Royal Academy of Engineering, UK. He has been elected a Fellow of the Indian National Academy of Engineering (INAE), Indian Academy of Sciences (IASc) and Indian National Science Academy (INSA). He is a member of the Editorial Board of the journal Advances in Water Resources and has been a member of several state and national committees dealing with urban water systems, urban flooding and operational and environmental aspects of water resources in India. His areas of professional consultancy include urban storm water drainage, floodplain management, river basin planning, reservoir operation, lift irrigation, hydropower development and impact assessment of water resources projects.

PROF JURG KELLER (LEAD MENTOR)

Prof Jurg Keller is the Chief Research Officer of the CRC for Water Sensitive Cities, a large industry-research collaboration supported by the Australian Government and over 80 participants. He is also the Deputy Director Research of the Advanced Water Management Centre at the University of Queensland, an internationally leading research centre he founded 22 years ago. He is one of the inaugural IWA Fellows and was 2012 elected as Fellow in the Australian Academy of Technological Sciences and Engineering. He is also the 2013 Water Professional of the Year, awarded by the Australian Water Association.

He has over 25 years' experience in water industry research, particularly in biological wastewater treatment, environmental biotechnology, bio electrochemical systems and resource recovery concepts. His academic impact has been remarkable with over 280 journal publications, attracting over 21,000 citations to date. Equally important, he has been highly successful in combining leading edge research and development activities with effective industry-relevant collaborations. His close working partnerships with many major water utilities in Australia and internationally have resulted in a range of beneficial outcomes for the industry and the researchers involved.

PROF. SIMIN DAVOUDI

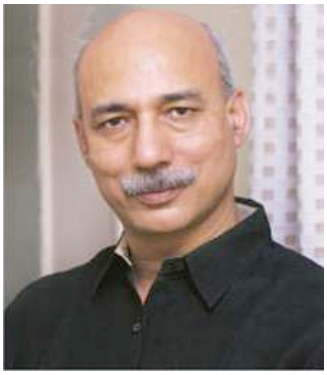
Prof. Simin Davoudi is Professor of Environmental Policy & Planning and Director of Global Urban Research Unit (GURU) at Newcastle University. She is past President of the Association of the European Schools of Planning (AESOP); Fellow of: the Royal Town Planning Institute, Academy of Social Sciences and Royal Society of Arts. She has advised three UK government ministries and two EU Directorate General, and held visiting professorships in Universities of Amsterdam, Nijmegen (the Netherlands), BTH (Sweden), Virginia Tech (USA), RMIT (Australia) and Tampere

(Finland). She has undertaken research and published widely on cities, spatial imaginaries, urban planning, environmental governance, climate change and resilience. Selected books include: The Resilience Machine (2018, Routledge), Justice and Fairness in the City (2016 Policy Press), Reconsidering Localism (2015 Routledge), Conceptions of Space and Place in Strategic Spatial Planning (2009 Routledge) and The Routledge Companion to Environmental Planning (forthcoming).

PROF. ASHVANI K. GOSSAIN

Dr. Ashvani K. Gosain, is Emeritus Professor in the Civil Engineering Department, IIT Delhi. Prof. Gosain pioneered the climate change impact assessment on Indian water resources that was incorporated in the NATCOM I & II – two National Communications made to the UNFCCC. He has also been reviewer for AR4 and AR5 of IPCC.

Prof. Gosain has served on many prestigious assignments within and outside the country. He has to his credit above two hundred papers published in refereed national and international journals and conferences. He has conducted a large number of research projects including four EU projects. Twenty students have completed their Ph.D. under his supervision. Prof. Gosain contributed to the formulation of the Ganga River Basin Management Plan (GRBMP), of which he was the Team Leader of the Water Resources Management group. He has also been engaged by the Delhi Government to formulate the Drainage Master Plan of NCT of Delhi. He is also part of the expert committees appointed by the National Green Tribunal to suggest solutions to deal with the ever increasing pollution levels in Ganga and Yamuna. Prof. Gosain has to his distinction the formulation of the Ganga Act on behalf of the Ministry of Water Resources, River Development & Ganga Rejuvenation, as a member of the committee. Prof Gosain has served as Head of the Civil Engineering Department and the Computer Services Centre of IIT Delhi.



PROF. ISA BAUD

Isa Baud is retired professor of IDs at the University of Amsterdam, former director of the Governance and Inclusive Development Programme there, and former president of the European Association of Development Institutes (EADI). She is currently chair of the National Knowledge platform on Inclusive Development of the Ministry of Foreign Affairs, and chairs the research programme on Urbanising Deltas in the World of NWO-WOTRO.

Her main interest concerns issues of improving urban governance and infrastructure development, particularly focusing on digital spatializedy knowledge management as a strategic instrument.

She has a wide experience in leading large research projects in several metro cities in India, and comparative research across other BRICS countries. Her most recent research project was Chance2Sustain, an EU-funded project on sustainability challenges for fast-growing medium-size cities in India, South Africa, Peru and Brazil.

In that project the complexity of introducing, maintaining and strategically utilising digital spatial knowledge to improve infrastructure building became quite clear. the project also consisted of eight teams with long-term experience in the concerned cities, with strong connections to policy and practice, from which a trans-disciplinary way of doing research emerged strongly.

This interest in multi-and trans-disciplinary research approaches informs her interest in this programme.

PROF. RAJAN RAWAL

Rajan Rawal is a faculty member at CEPT University. He teaches energy efficient built habitat, energy modeling, energy policy at postgraduate level. His work emphasis is on 'energy performance of human habitat' and 'architectural science education'.

Presently, He is Executive Director of "Centre for Advanced Studies in Building Science and Energy" (CARBSE) at CEPT University. Prof Rawal led Indo-US Joint Clean Energy R & D Centre - Building Energy Efficiency Sector, and presently leading one project of Indo-UK project on Energy Demand Reduction . He is also active member of Mission Innovation challenge on heating and cooling in buildings from India side. He is a member of International Energy Agency task 69 on low energy buildings, Annex 79 and Annex 80. He is also a senior expert at Global Building Performance Network.

Prof. Rawal is a member of various technical committees of Bureau of Energy Efficiency, India, National Building Code, IGBC and GRIHA. He is a founder member of India Chapter of International Building performance simulation association (IBPSA) and serves as Chair of Education at IBPSA World Executive committee. He serves as an executive committee member and board of management at several philanthropic and non-governmental organizations. He is part of the editorial board of two leading journals and has several research papers, book chapters, and projects to his credit. He is one of the administrators of ambitious Global Cooling Prize challenge.

Centre for Facilitation

Christine Bell

Christine is a creative and engaging facilitator with over 20 years of experience. Christine has an outstanding track record in designing engaging inclusive events which encourage full participation from all attendees. She has facilitated a rich variety of Innovation Events in the UK, Norway and India.

Christine has been exploring ways of addressing some of the challenges of the conventional problem orientated innovation workshops design and has adapted typical processes to support true co-creation.

In addition to events focused on creative idea generation Christine also facilitates a wide range of meetings and events. This can range from a vision setting activity with a small group of trustees to a large-scale consultation process involving multiple stakeholders. Christine is keen to explore ways in which digital processes can support the collaborative group work.

Christine is interested in topics of sustainability including food and is personally committed to a healthier and more sustainable diet and is really interested to see how the ideas develop during the Sandpit. During this event Christine is a passionate cyclist and a veteran women's tandem record holder for endurance cycling, If you share a passion for cycling she would love to have a conversation with you.

Lucy Brownsdon

Lucy, a professional facilitator Lucy's background is Change Management and she has facilitated many 4 and 5 day Innovation events in the UK, India and Norway and many smaller multi-disciplinary innovation events for research teams across Europe.

Lucy is an enthusiastic facilitator who supports participants, quickly identify connections and build relationships before embarking on true collaboration. She approaches this in dynamic and different ways. Lucy has developed a style which supports the effectiveness of inter disciplinary working through her skills at focused listening, summarization and pragmatic decision making. She uses her knowledge and experience of team working to support project teams to address difficulties they are experiencing in making progress as a team.

Lucy's experience is considerably wider than facilitating I innovation events. She runs many other types of meeting that needs to be productive and energetic including strategy workshops, retreats, conferences, business critical problem-solving workshops, conflict resolution, and focus groups/consultation events and change programmes. Lucy works with clients from academia and across most industry types.

With travel being such a big part of facilitation Lucy values her 'home' time specifically enjoying outdoor activities with two energetic fun-loving dogs.

NWO & DST representatives

DR. SANJAY BAJPAI, DST

Dr. Sanjay Bajpai has graduated in Mechanical Engineer from Malaviya National Institute of Technology (MNIT), Jaipur, Rajasthan (India) and has pursued Masters in Business Administration (MBA) from University of Rajasthan, Ajmer (India). He has done his doctoral research in energy domain from Indian Institute of Technology, Delhi. He has over 30 years of industrial and R&D management experience.

Equipped with training in Mechanical Engineering and Management and doctoral degree in Energy Studies, coupled with exposure gained through handling these diverse programmes, he has acquired specialization in the area of management of Technology Development, Demonstration and Commercialisation Programmes as well as socio- economic programmes requiring application of Science & Technology.

He is currently Head of Technology Missions Programme leading Research Development and Demonstration Programmes on water technologies and energy of Department of Science and Technology (DST), Ministry of Science and Technology, Government of India. Besides fulfilling the promotional role expected of the above programmes, he has developed several innovative programme for promotion of national, bilateral and multi-lateral research. He has also represented ountry in several international fora. He has also published quite a few scientific papers in leading national and international journals.

DR. NEELIMA ALAM, DST

Dr. Neelima Alam completed her Doctorate research from All India Institute of Medical sciences (AIIMS) in the field of Structural Biology in the year 2001. She was then extensively involved in a NIH funded project as Postdoctoral fellow at Merkert Chemistry Centre, Boston College, Boston, U.S.A for 4 years. She later moved back to India and successfully coordinated a DST funded Fast track project in 2004 at School of Life sciences J.N.U before she joined Department of Science and Technology as Scientist 'C' from 2007 onwards. From June 2007 till March 2012 was primarily handling the Institution based mechanisms for technology commercialization through Technology Business Incubators and Science and Technology Entrepreneurship Parks, to provide the crucial missing linkage between the academia and the commercial zone.

From April 2012 as Scientist E, she is looking after the Water Technology Initiative (WTI) programme of the Technology Mission Division, DST and is involved in promoting technology development and application for addressing various pure drinking water challenges in the country. She has promoted and nurtured various technological solutions related to quality and quantity issues of drinking water and dovetailed them as customized solutions in the real field conditions. She has been involved in r innovative deployment of research led technological solutions to address various water challenges,in the field. This 'solution science' oriented mission required novel methodologies and mechanisms for time bound delivery, which were devised and implemented by Dr Alam. She is also involved in leveraging critical bilateral and multilateral linkages for global collaborations in the area of Water research. She has been extensively involved in evolving and implementing major bilateral/multilateral collaborations of DST such as Water Advanced Research Innovation (WARI) fellowship with US Collaboration and Bilateral research and Capacity Building programme with France, Netherlands, UK and USA to tap global expertise.

Ms. Sonja Döpp, NWO

Sonja Döpp works since 2016 as a policy officer at NWO, the Netherlands Organisation of Scientific Research. Within the team WOTRO Science for Global Development she coordinates research programmes in the fields of water, climate change and food security.

Sonja holds a MSc in Geology and Geochemistry (Free University Amsterdam, 2007). She started her career as researcher and consultant at TNO, the Netherlands Organisation for applied Scientific Research, where she gained experience in the field of climate change adaptation, sustainable urban development and corporate social responsibility. Following, she worked as project coordinator in the Dutch research programme Knowledge for Climate. In that position she was involved in the development of the Dutch National Climate Adaptation Strategy and initiated several activities for the uptake of interdisciplinary knowledge in policy and practice.

In her work Sonja likes to explore new and creative ways of connecting people, knowledge and interests, in order to enhance innovative research development and creating impact with research. She has introduced and organized several types of process and activities with that purpose, in the form of conferences, business challenges, research workshops like this Sandpit.

Dr. Lise de Jonge, NWO

Lise de Jonge is a senior policy officer at The NWO Domain Applied and Engineering Sciences (AES). AES connects people and resources to develop science-wide technology and technical knowledge that contribute to creating economic added value and solving societal issues.

Within AES, Lise coordinates research programmes on Life, Science & Technology. Her main focus is on stimulating interdisciplinary, public-private partnerships by bringing stakeholders and researchers together, and by supervising projects towards optimal opportunities for knowledge transfer. With expertise and interests in interdisciplinary research approaches, she is highly enthusiastic about developing a joint Indian-Dutch research programme by means of a Sandpit model.

Lise is a biomedical engineer (PhD 2009, Radboud University Medical Centre). After her postdoc at Imperial College London, she worked at Imperial Innovations, a technology commercialisation company. In 2013, she joined Technology Foundation STW, which activities are incorporated in the NWO Domain AES since 2017.

Ms. Corinne Lamain, NWO

Corinne Lamain is a senior policy officer at NWO-WOTRO Science for Global Development. She coordinates research programmes on food security and conflicts around climate change, with a particular interest in enhancing relevance as well as the potential for impact of research. Throughout the years Corinne has developed expertise on: designing research programmes such that approaches for achieving impact are integrated; developing Theories of Change and pathways to impact; knowledge brokering; developing Monitoring & Evaluation processes in ways that serve learning purposes; designing and organising events and activities for meaningful exchange of knowledge; developing trainings that enhance capacities of researchers and partners to conduct research in manners that contribute to achieving impact.

Corinne enjoys to collaborate with researchers, partners and funders on furthering such approaches, because she believes strongly in intrinsic motivation.

Corinne has completed a MSc in International Development Studies and is PhD researcher in the field of climate interventions (hydropower and REDD+) and their interrelations with security discourses and conflict dynamics, in the Eastern Himalayas and Myanmar.

DR. BERRY J. BONENKAMP, NWO

Berry J. Bonenkamp is Senior Policy Officer at the Netherlands Organisation for Scientific Research (NWO), the national research council of The Netherlands.

Since 2009 he has been working in the field of the social sciences with ICSSR, and since 2011 he coordinates the India cooperation at NWO. He coordinates the bilateral Indian-Dutch research programmes with DST and DBT, aimed at stimulating sustainable collaboration between Dutch and Indian research groups. Furthermore, he is working on the multilateral Indian-European research cooperation.

NWO has been cooperating for many years now with the Indian partners DST, DBT, MeitY and ICSSR. The programmes range from exchange visits and seminars, fundamental research and PhD training, to science-industry (public-private partnerships), applied and practice-oriented research. Together with DST, DBT and MeitY, NWO launches annual calls.

NWO has embarked on a joint strategic policy for research collaboration with India. Together with Dutch and Indian stakeholders, NWO has set up a strategic dialogue for the future Indian-Dutch research agenda.

Glossary

India-NWO Cooperation programme	Longstanding India-NWO partnership in funding joint research proposals
Research programme	Research programme (proposal) that is developed within this Urban Water Systems call (Sandpit)
Work package	The research programme is divided into multiple interrelated work packages (WPs). Together, the WPs form one interdisciplinary, coherent research programme.
Programme leader	The main applicant of the research programme. Each research programme proposal has an Indian and Dutch main applicant, who bears responsibility for the programme toward DST and NWO respectively.
Work package leader	The lead researcher of a work package. Each work package has an Indian and Dutch work package leader.
Programme design	An outline describing the research programme, including the type and number of work packages that would be required to achieve the research programme's objective(s). The programme design also contains the estimated financial resources. At the end of day 3 of the Sandpit, applicants submit their programme design using the format provided.
Full programme proposal	The final research programme proposal with a detailed description of the work packages defined within, the financial resources required (per work package). There is a clear one-to-one relationship between the programme design and the full programme proposal, in terms of scope, objectives, applicants, research community and stakeholders, and requested budget.
Theory of Change	A Theory of Change describes how the research process contributes to impact, taking into account the context, actors involved and describing the sequence of logically-linked cause-effect relations. Developing a Theory of Change in joint effort with research partners as well as stakeholders allows for making explicit which (and whose) problem is being tackled and how the desired change is perceived to happen through research efforts. The Theory of Change leads to the Research Impact Pathway.
Impact Pathway	A Research Impact Pathway is the visualisation of the change process following from research execution as described in the Theory of Change. It explicates the expected change process through the realisation of the research output and outcomes, and the desired contribution to impact. It describes the sequence of expected logical cause-effect relations, including underlying assumptions.

Research output	The direct and immediate insights obtained by a research project or programme.
Research outcome	Change in behaviour in behaviour, relationships, actions and activities of stakeholders in the business and policy environment, resulting from exchange of knowledge and the uptake of research output.
Research impact	The 'big picture' changes in economic, environmental or social conditions that a research programme or work package aims to realise.
Indicators	Indicators, at output and outcome levels, facilitate monitoring progress and accordingly adjusting the research approach, where the assumptions proved insufficient or incorrect.
Stakeholders	Natural or legal persons (at local, national or international level) who have an interest in the results of the research. This definition includes internal stakeholders (consortium partners) and external stakeholders (non-project partners), as well as primary stakeholders (those who are intended to benefit or may be affected by the intervention, also end users or target groups) and secondary stakeholders (those with an intermediary role).
Co-creation	A form of cooperation in research where different parties (researchers and stakeholders) interact and engage in joint learning in a knowledge demand and supply process. Such interaction and joint learning takes place in the different stages of this process: the problem definition, formulation of possible solutions, design of the research, conducting the research, the assessment of the results, and the translation of these into new practices and products. The diversity of perspectives and of the type and level of knowledge is seen as an asset that can support a constructive way of mutual learning and design.

Intentionally left blank for notes

NWO | Netherlands Organisation for Scientific Research

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY