**SCHOOL OF WATER AND WASTE**

The School of Water and Waste, a key constituent of CSE's Anil Agarwal Environment Training Institute (AAETI), was established as part of a bigger agenda to build capacities among practitioners. The school aims to establish policy principles, innovative technologies, and implementation strategies for citywide water and sanitation management and lay the foundations for a water and waste-prudent society. This experience needs to be leveraged to share solutions with other countries in the developing world from South America, Africa and Asia. These regions face similar struggles to meet the needs of urban population under the current water and wastewater paradigm.

Thus, the school is a capacity building hub for urban sanitation across India and the Global South. It seeks collaborations and MoUs with key governments and other knowledge partners including national and international institutions (academic and research), and NGOs. A crucial component of the school is operationalising a referral laboratory on septage management which will test different tools, approaches, and efficiency of various decentralised wastewater systems.

**THE SFD WEEK**

With growing urbanisation, cities are becoming water-guzzlers, often dependent on either groundwater or distant cleaner upstream sources, even as they discharge their waste downstream. The conventional method of wastewater management is capital- and resource-intensive and hence, is unaffordable for many cities. This has resulted in higher dependence on on-site sanitation systems across India and the Global South. CSE’s Sustainable Water and Sanitation Programme is geared to help re-invention of urban water-wastewater management.

This event is part of CSE’s initiative on knowledge support and capacity building of - Ministry of Housing and Urban Affairs (MoHUA) and Ministry of Water Resources, River Development & Ganga Rejuvenation, State / target town/cities across India for mainstreaming FSSM for achieving citywide sanitation and river health. It includes identification of the best suited technologies and other related aspects such as knowledge sharing on enforcement of FSSM policies/guidelines/regulation, behavior change and more, aimed to push for convergence of programmes namely Swachh Bharat Mission, AMRUT and Namami Gange at city level - and support cities journey beyond ODF.

The three-days event is being organised at CSE’s newly built state-of-art residential facility, AAETI, Nimli, Rajasthan.

**Day 1:** The role of FSM in citywide sanitation and how tools like SFD can contribute.

**Day 2:** Containment systems and best practices in emptying and transportation of faecal sludge.

**Day 3:** Best technologies for wastewater and faecal sludge treatment including resource recovery and business strategies for supporting such practices.

**PARTNERS**

**SuSanA:** An informal network of people and organisations sharing a common vision on sustainable sanitation. SuSanA came into existence in early 2007. Since then, it has provided a platform for coordination and collaborative work. SuSanA connects members to a community of people with diverse expertise and opinions. It also serves as a sounding board for innovative ideas and contributes to policy dialogue through joint publications, meetings and initiatives.

**IWA:** The International Water Association (IWA) brings people across the water profession together to deliver equitable and sustainable water solutions for our world. With the renewed focus in India on ensuring water for all and the unprecedented civilizational leap to ensure sanitation across the nation, IWA has decided to expand its operations in India.

**NFSSM Alliance:** National Faecal Sludge and Septage Management Alliance (NFSSM Alliance) is a national working group that was convened in January 2016. The alliance has a vision to create an enabling environment which amplifies scaling of safe, sustainable and inclusive FSSM through knowledge, partnerships and innovative solutions by 2025. It currently comprises of more than 32 organisations across the country working towards solutions for Indian States and Cities.
AGENDA

APRIL 2, 2019 (TUESDAY)

REGISTRATION & AAETI CAMPUS TOUR
9:30-10:30 AM

TEA/COFFEE 10:30-11:00 AM

INAUGURAL SESSION
11:00 AM-1:30 PM

- SETTING THE CONTEXT
  SUNITA NARAIN, Director General, CSE

- ADDRESS
  DHESEGON NAIDOO, CEO, WRC, South Africa
  KALA VAIRAVAMOORTHY, Executive Director, IWA, Netherlands
  MADHU KRISHNA, Country Lead, BMGF, India
  ARNE PANESAR, Head of Program, GIZ, Germany

CHIEF GUESTS
RAJIV RANJAN MISHRA
Director General, NMCG, Govt. of India
DURGA SHANKER MISHRA
Secretary, MoHUA, Govt. of India

LUNCH 1:30-2:30 PM
APRIL 3, 2019 (WEDNESDAY)

DESIGNING AND IMPLEMENTING FSM POLICIES AND STRATEGIES IN CITIES
EXPERIENCE OF REGULATING CHANGE
9:00-10:45 AM
Chair: DHESIGEN NAIDOO, WRC
Africa & South Asia

- Damoncete & Baliwag, Philippines
- Ethekwini, South Africa
- Dar-es-Salaam & Dhaka

MANOJ ROY, Lancaster University

TEA/COFFEE 10:45-11:45 AM

CULTURAL EVENING & RECEPTION DINNER
7:30 PM

APRIL 4, 2019 (THURSDAY)

EXISTING TECHNOLOGIES FOR TREATMENT / CO-TREATMENT OF FSS
WHERE IT IS WORKING AND SCALE HAS BEEN ACHIEVED
9:00-10:45 AM
Chair: KARTIK CHANDRAN, Columbia University

- Excreta and sewage management at Kumbh 2019
- City-level septage treatment, Accra
- Technology options and experiences of thermal FSSTP in Warangal
- Co-treatment of organic waste with septage
- Co-fermentation of septage and solid waste at Nashik

TEA BREAK 10:45-11:15 AM

NEW TECHNOLOGIES FOR FSS AND WASTEWATER TREATMENT
11:15 AM-1:00 PM
Chair: STEFAN REUTER, BORDA, Germany

- Treatment of human faecal waste by black soldier fly larvae
- Biological control of infection and smell from wastewater for use in garden

DINNER 7:30 PM
Eco bridge for on-channel (incl. lakes/ponds) wastewater treatment
SAYALI JOSHI, SERI

Phytorid & constructed wetland for sewage treatment
RAMAN SHARMA, NEERI

Metagenomics of faecal sludge and applications of deep characterisation
KARTIK CHANDRAN, Columbia University

LUNCH 1:00-2:00 PM

RESOURCE RECOVERY AND BUSINESS POTENTIAL IN FSSM
2:00-3:30 PM

Chair: JAY BHAGWAN, WRC

How faecal sludge and wastewater can be managed by farmers
S VISHWANATH, Biome

Microbial fuel cell (MFC) technology for treatment of urine and wastewater streams while generating electricity
OULAWATOSHIN OBATA, UIWE

Smart microbial fuel cell-bioelectric toilet technology
M M GHANGREKAR, IITK

Recovery recovery and business strategies for FSM in Ganga towns
KRISHNA RAO, Independent consultant

Economic spillover effects from FSM programmes in Philippines
DAVID ROBBINS, Global Development Services

TEA/COFFEE 3:30-4:00 PM

CLOSING SESSION
WHAT IS NEEDED TO BE DONE TO CONVERGE RIVER POLLUTION AND URBAN SANITATION?
4:00-5:00 PM
Moderator: SUNITA NARAIN, CSE

APRIL 5, 2019 (FRIDAY)
Field visit & sightseeing (optional)

CHIEF GUESTS

SHRI D S MISHRA, IAS, is the current Housing and Urban Affairs Secretary of India. He is also the Chairman of the Delhi Metro Rail Corporation. He is a 1984 batch Indian Administrative Service officer of Uttar Pradesh cadre. Mr. Mishra is graduate (BTech) in electrical engineering from IIT Kanpur. He also holds an MBA degree in international business from the University of Western Sydney. Mr. Mishra also holds a postgraduate diploma in public policy from International Institute of Social Studies, The Hague. In addition, he has a postgraduate diploma in human resource management. Mr. Mishra has served in various key positions for both the Government of India and the Government of Uttar Pradesh.

SHRI RAJIV RANJAN MISHRA, IAS, is the Director General, National Mission for Clean Ganga, Government of India. He has previously served as Additional Secretary and Joint Secretary at the Ministry of Housing and Urban Affairs, and the Mission Director for National Mission for Clean Ganga. He has a BTech in Mechanical Engineering from IIT Kanpur and a Certificate in Public Budgeting from Andrew Young School, Georgia State University. He also has a Certificate of Advanced Studies in Public Administration from Syracuse University-Maxwell School, USA.
**SPEAKERS**

**MS SUNITA NARAIN** is the Director General of CSE, Director of the Society for Environmental Communications, and Editor of the fortnightly magazine Down To Earth. She was listed among the world’s top 100 public intellectuals by Foreign Policy Journal. She was awarded the Padma Shri and World Water Prize by the Stockholm Environment Institute in 2005.

**MR DHESIGEN NAIDOO** is a leader, a scientist and an activist for positive social change. He leads the Water Research Commission (wrc), South Africa. He is a Councillor at South African National Advisory Council on Innovation (sunac) and a Fellow of the Mapangubwe Institute for Strategic Reflection (mistra).

**PROF KALA VAIRAVAMORTHY** is executive director of IWA, Netherlands, the founding director of the School of Global Sustainability at the University of South Florida in Tampa, USA; and Professor of Sustainable Urban Water Infrastructure Systems at UNESCO-IHE. He is also a Chartered Engineer and a Fellow of the Institution of Civil Engineers (UK). He is also the Director of SWITCH an EU research project.

**MR DIRK WALTHER** is project director of Soil Protection and Rehabilitation in India. He previously directed the ‘Support to National Urban Sanitation Policy’ project of GIZ and is an expert in water and sanitation. His experience includes research, policy advocacy and project implementation on water and sanitation.

**MR STEFAN REUTER** is Executive Director of BORDA. He is responsible for coordinating and managing BORDA’s activities in the regions and at HQ. He works closely with other civil society organisations and the private sector to advocate for sustainable water and sanitation solutions.

**MR DORAI NARAYANA** has a B. Tech from IIT Madras, and a Graduate Certificate in Engineering (Environmental Management) from Melbourne University. He is now a consultant in the sanitation and sewerage sector, working in Malaysia, India and Africa with various international agencies.

**MR ANDY PEAL** is a Chartered Civil Engineer with over 25 years of experience in the water, sanitation and hygiene (wash) development sector. As an independent consultant, he works on both research and implementation with a focus on urban sanitation in South Asia and sub-Saharan Africa.

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**MR K PRAKASH BABU** has a diverse business sector experience. Previously, he managed the project where over 14,000 IHHLs were constructed and he helped Tata Trusts in Krishna, Andhra Pradesh paving way for the district to be declared ODF. Currently, he manages the launch of FSTPs in Andhra Pradesh.

**DR SURESH ROHILLA**, is senior director, water programme, CSE and academic director, School of Water and Waste, AAETI. He holds a doctoral degree from Queen’s University Belfast and post-graduate degree(s) from JNU and SPA. He has received Fullbright Nehru Environmental Leaders Programme Fellowship (2012) and Government of Netherlands Fellowship (2014).

**DR ARNE PANESAR** heads the Sustainable Sanitation Sector Programme and SuSanA secretariat at Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Germany with over 20 years of expertise in the sanitation sector. He specializes in Shit Flow Diagrams (sfd), citywide sanitation and digital approaches in sanitation.

**DR DINESH MEHTA** is a Professor Emeritus and joint project director of Center for Water and Sanitation, CEPT. He has published extensively on poverty and equity issues. Dr Mehta has a PhD from University of Pennsylvania and a Master’s in City and Regional Planning from Harvard University.

**MS MADHU KRISHNA** leads BMGF India’s initiative on Water, Sanitation and Hygiene. She has been a development professional for over 16 years, with a special focus on program design, evaluation, and policy and advocacy across public health, livelihoods, and women’s empowerment.

**MR DORAI NARAYANA** has a B. Tech from IIT Madras, and a Graduate Certificate in Engineering (Environmental Management) from Melbourne University. He is now a consultant in the sanitation and sewerage sector, working in Malaysia, India and Africa with various international agencies.

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MR GRANT MACKINTOSH is a managing director, Emanti Management. He’s a water utilisation engineer with an interest in municipal water and sanitation services, and has played a leading role in various South African initiatives. He is also Project Director on the WRC project to initiate, establish and grow the use of SFDs in South Africa.

MR DAVID ROBBINS helps local governments in developing countries for design, build and operate decentralized wastewater management systems (dwwms), and implement septage management programs using a bottom-up stakeholder driven planning process. He has 12 years of international experience in South Asia and Central America.

DR MANOJ ROY is Lecturer of Sustainability at Lancaster Environment Centre, Lancaster University, UK. In the pursuit of policy relevant findings, he applies novel interdisciplinary methods combining technical analysis with a social and political analysis. His research countries include Bangladesh, India, Ethiopia and Tanzania.

MS SRINITHI SUTHAKAR works as a specialist in governance and enabling framework for the TNUSSTP team, Chennai. She has worked in the Environmental and Social Division of CDM Smith India (P)Ltd. She has also studied socio-economic impacts on development induced displaced people and prepared Resettlement Action Plans.

MR STANZIN TSEPHEL leads the implementation and administration of all BORDA South Asia operations. For over 15 years his work has focused on the environment and poverty, working with national and international organisations. He has an M.B.A from the Institute of IRMA and a Master degree in Environment Change and Management from University of Oxford, England.

MR JAY BHAGWAN is the Executive Manager of Water Use and Waste Management at the South African Water Research Commission. He has been instrumental in driving FSM and the international series of a successful FSM conference. He has currently launched the IWA specialist group on non-sewered sanitation and chairs it.

MR CHANDRA BHUSHAN is the Deputy Director General of CSE. Chandra leads the research programmes in Industry & Environment, Waste Management, Climate Change, Renewable Energy, and Food Safety & Toxins. He sits on various national committees in India, has authored several books and is a Consulting Editor for Down To Earth magazine.

MR MIDHU SV has 15 years of experience in R&D of innovative products, Water and Sanitation, New Product Development, User centric designs, and Project Management. He is working with national and international organizations and universities for developing technology enabled sustainable water and sanitation products.

MR BHITUSH LUTHRA has a Masters degree in Environmental Engineering and Management from IIT Kanpur. He is involved in research and training on subject related to decentralized wastewater treatment and septage management. His field of interest includes sanitation, water and wastewater treatment, septage treatment.

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MS NAMITA BANKA is Founder and CMD of Banka BioLoo (Human waste Managers). Her focus is on providing sustainable Solutions to the challenges of basic Sanitation and hygiene. Namita was recently conferred the Udyami Award by the Vice President of India for her innovation and business model.

MR MIDHU SV has 15 years of experience in R&D of innovative products, Water and Sanitation, New Product Development, User centric designs, and Project Management. He is working with national and international organizations and universities for developing technology enabled sustainable water and sanitation products.

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DR AMADOU GUEYE is the Director of Research, Development and Training at DELVIK Sanitation Initiatives and has a PhD in Environmental Sciences. He has conducted research on planted drying beds from the perspective of reuse of vegetable biomass, treated leachate and biosolids in urban agriculture.

MR DHRYU BHAVSAR is a Senior Program Lead with Center for Water and Sanitation, CEPT University, Ahmedabad. He provides technical support to Government of Maharashtra with Swachh Maharashtra Abhiyan and develop frameworks to monitor and improve urban WASH.

MR PLABAN GANGULY is working as Marketing and Communications Coordinator in Practical Action, Bangladesh. He has campaigned on FSM and soil health. His team is working on advocacy issues related to FSM and soil health and is trying to raise awareness about it among government and stakeholders.

MR PRASHANT ARYA is a Research Assistant at CPR, Delhi. He is currently studying the provision of sanitation infrastructure across Indian cities, with a focus on delivering equitable and sustainable solutions. His research interests lie in the creation of urban infrastructure, and the emerging forms of socio-technical politics around these infrastructures.

MR RAHUL MANKOTIA provides programme support to Uttar Pradesh on FSS Management. He holds a Bachelor's Degree in Civil Engineering and a Master's Degree in Management (Finance). He has 10 years of experience in infrastructure projects as well as consultancy assignments for government sector client.

MR RAJKIRAN C A is a Production engineering expert for thermal FSTPs. He has over nine years of experience in manufacturing across different sectors. He has executed engineering systems and has been an integral part of the set-up of the country's first three thermal FSTPs.

MR SANJAY PAL is an associate professor in School of Biotechnology, Amrita University, Kerala. He received his PhD in plant biotechnology from IIT Kharagpur and his post-doctoral training at the University of Texas Health Science Centre at San Antonio & University of Guelph, Canada. His current interest lies in sanitation biotechnology, developing different models of decentralized sanitation systems.

DR SUDIPTA SARKAR is an Associate Professor of Environmental Engineering at IIT Roorkee. Along with remediation of industrial wastewater and contaminated drinking water projects, he is developing an insect-mediated viable technology for efficient treatment of Indian MSW. In 2013, he won Reinvent The Toilet Challenge India round of the BMGF.

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MS FLORENCE COBBOLD is a civil/sanitary engineer, and a senior member of the Ghana Institution of Engineering. She was honoured as the Distinguished Woman in Engineering in 2017 at the 4th Engineering Excellence Awards. She has served over 15 years in the public sector and co-authored various research publications on FSM.

DR ABULAI ABDULLAH MIYEED has authored more than 40 technical papers in National and International Journal and Conference Proceedings. He has also written three text books on water and environmental engineering. At present, he is working as Head of Policy and Advocacy in WaterAid, Bangladesh.

MR PRASHANT ARYA is a Research Assistant at CPR, Delhi. He is currently studying the provision of sanitation infrastructure across Indian cities, with a focus on delivering equitable and sustainable solutions. His research interests lie in the creation of urban infrastructure, and the emerging forms of socio-technical politics around these infrastructures.

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DR RAMAN SHARMA has a Ph.D. in Environmental Engineering from IIT Delhi. His research experience spans across India (BITS, Pilani), Europe (University College Dublin, University of Exeter, Technical University Darmstadt and Technical University Delft Netherlands) Australia (University of Queensland), Germany. He was awarded the INSA in 2016.

DR OLuwatosin Obata is a Post-Doctoral Research Associate at the UWE, where he works on the Urine-tricity project. He has a PhD in Energy and Environment from University of Aberdeen, a Master’s Degree in Environmental Biotechnology (distinction) from University of Abertay, UK and a Bachelor’s Degree in Plant Science (First Class), from University of Benin, Nigeria.

MR S VISHWANATH is a Civil Engineer and an Urban Planner. He is a Trustee with the Biome Environmental Trust with 32 years of experience in the water, wastewater and sanitation sector. He is an Adjunct Professor and teaches a course on Water at the Azim Premji University, Bengaluru, India. He writes a weekly column called Waterwise in The Hindu.

MR KRISHNA RAO is a development expert with an academic background in international development and non-profit management. He is a NYU Reynolds Fellow in Social Entrepreneurship and has extensive experience in providing decentralized solutions for the poor in the areas of energy water, sanitation, transport and telecommunication.

PROF M M Ghangrekar is Prof. in Department of Civil Engineering. He is a Civil Engineer with M.Tech and Ph.D. in Environmental Engineering. He has published extensively and presented in more than 200 conferences in India and abroad. He was rewarded the Swachh Bharat Award 2017, Gandhian Young Technology Innovation awards.

DR KARTIK CHANDRAN is a Professor of Environmental Engineering at Columbia University. His work focuses on understanding and re-engineering the microbial nitrogen cycle while exploring its links with the carbon, water and energy cycles. In 2015, he received the MacArthur Fellowship for his innovative work on 'transforming wastewater from a troublesome pollutant to a valuable resource'.
ABOUT CSE
Centre for Science and Environment (CSE) is an independent public interest research organisation that aims to promote an informed public opinion in favour of environmental sustainability and sustainable development. The Centre was established in 1980 to analyse and study the relationship between environment and development. CSE’s work is widely acknowledged for its intellectual leadership and the institution has grown into one of the Global South’s most influential environmental NGOs.

ABOUT AAETI
Anil Agarwal Environment Training Institute (AAETI), a CSE initiative, is a learning, training and innovation centre designed to find appropriate and affordable solutions to some of the most pressing problems faced by the Global South—from climate change, air pollution and urban mobility to water and waste management and environmental degradation. AAETI aims to strengthen capacities among state and non-state practitioners, and is supported by state-of-the-art research, information services and a platform to interact and exchange ideas on best practices. To encourage participation, the courses offered at AAETI are linked to the training needs of the specific target groups and synergise with certificate and diploma courses offered by mainstream universities.