

## **Regional Workshop on Energy and Resource Efficiency in Urban Water Management in Kolkata**

Centre for Science and Environment (CSE) organized a one day regional workshop on '**Energy and Resource Efficiency in Urban Water Management**' on **June 20, 2013** at the Mahanayak Manch, Unnayan Bhawan, Kolkata Metropolitan Development Authority (KMDA), Kolkata, West Bengal. The workshop was supported by Urban Development Department (UDD), Government of West Bengal and KMDA as the local state partner. The workshop is part of various activities supported by National Urban Renewal Mission - Comprehensive Capacity Building Programme (NURM – CCBP), Ministry of Urban Development, Government of India.

### **Session 1: Inaugural Session**

**Mr Arup Kumar Saha, CEO, KMDA**, welcomed the participants representing key functionaries from Municipal Corporations, Public Health Departments, Water and Sanitation Boards, Ground Water Boards, Pollution Control Boards, Programme Management Units (PMU), Programme Implementation Units (PIU) and local bodies of the Government of West Bengal, Meghalaya, Jharkhand and Odisha. Other key participants included faculty and researchers from IIT-Kanpur, IIT-Kharagpur, IIT-Guwahati, Jadavpur University, Bengal Engineering and Science University-Shibpur (BESU), University of Calcutta; Institutions (Centre for Built Environment, All India Institute of Hygiene and Public Health, Institute of Environmental Studies & Wetland Management and Administrative Training Institute), consultants (IPE Global, GIZ India), private practitioners (Unitech Water Technologies), architects and planners (Stesalit Limited, IL&FS Infrastructure Development Corporation) and NGOs (WWF-India and Vasundhara Foundation) involved in the advocacy of sustainable urban water and wastewater management in target states.

In this speech he mentioned that it's important to create awareness among the people about the best management practices in energy and water development projects and to talk about the key issues related to water/waste water management.

**Mr. Debashis Sen, Principal Secretary, UDD, Government of West Bengal**, was the Chief Guest of the workshop. He stated that given the rate of rapid urbanization in India and shortage of land, we can no longer afford huge conventional treatment plants and thus the need to prioritize more efficient and mechanized plants that are using latest compact technologies was consequently stressed. He said that even though the initial cost of these technologies might be high but latter it will pay off. He also highlighted the need to reduce excessive water consumption and misuse though increasing social consciousness and awareness in addition to technological advancements like SCADA to estimate and detect the water losses. He questioned the need to subsidize water supply as excessive water is being

extracted/consumed or misused by consumers. In also talked about water quality and mentioned that the state of West Bengal has decided to treat 10% of wastewater through membrane technology for tertiary treatment. He highlighted the need for surface water treatment plants due to huge arsenic contamination in West Bengal. He cited the need to have solar plants in parallel with sewage treatment plants (STP) in order to attain energy efficient systems. He concluded by claiming that although the state of West Bengal is doing a fairly good job in terms of water supply and treatment, they need to move towards a new era which will be more efficient and technologically sound.

**Dr. Suresh Kumar Rohilla, Programme Director, Water Management, CSE** gave a brief about CSE and shortcomings of NURM phase I goals to be achieved in the phase II. He emphasized the importance of the linkage between water and energy as being the key object for the NURM phase II leading to establishment of 'smart cities' that would be carbon neutral and energy efficient. He talked about the water-sewage connection and highlighted the present conventional scenario of bringing water into the city from 'further and further away'; and carrying the waste out of the city 'further and further away'.

He presented the current water supply paradigm:

**More water supplied = More waste water generated = more costs for treatment = Unsustainable**

He emphasized on the fact that we cannot 'play catch up game' and also cannot 'flush and forget' as water is everybody's business. Thus there is need to understand the socio-economic connect for intervention of innovative technologies which are **affordable and sustainable**.

He set the tone of the workshop by laying out the objectives of the regional workshop as follows:

- To generate awareness about the best management practices (BMPs), state of the art knowledge and reforms in the area of energy and resources efficiency.
- To discuss with key stakeholders the concept, issues/barriers and experiences in mainstreaming of BMPs/NURM reforms in the sustainable water management area.
- To explore capacity building support required to implement projects aimed at mainstreaming BMPs and reforms in the NURM schemes.

**Representatives of the States, West Bengal and Meghalaya** presented an overview of NURM water/wastewater projects in their respective states giving the existing and proposed reforms/BMPs for mainstreaming energy and resource efficiency in their states.

**Dr. Nidhi Pasi, Programme Officer, Water Management, CSE** gave an overview about the best management practices for building water efficient cities. She said that the present water paradigm is inefficient as the local conditions make water distribution an extremely energy intensive service. She stated that there is lot of potential to move towards decentralized water management systems which is cost and energy effective. She discussed the majors taken by CSE in this direction; a) on water conservation and efficiency through **Rain Water Harvesting (RWH)** which helps in reducing cost and

losses of delivery; b) moving to the use of **water efficient fixtures** which is a low hanging fruit and easily achievable as it can save 35% of water and c) practice of **decentralized wastewater management** including recycle and reuse. She stressed on the advantages and successful use of the above systems (in combination) which help in reducing energy cost and water demand.

## **Session 2: Energy and Resource Efficiency in Urban Water Management: BMPs and Case studies**

**Prof. Vinod Tare, IIT-Kanpur** gave a presentation on **water and sanitation in urban centers: Land and energy nexus**. He stated that toilets pose the biggest contribution to the environmental contamination as we have the habit of '**drop and store**' and '**flush and forget**'. According to him the irony of the situation is that although water is scarce but still we are using precious drinking water to transport excreta into our rivers, oceans and aquifers as a sink for untreated waste.

He pointed out the need to shift the present paradigm from linear to circular loop so that it's more sustainable and efficient. He mentioned that we humans have a tendency to opt for short term measures for curing a problem which leads to cure the problem superficially/temporally. He underlined the need to apply the modern science and new technologies but with traditional wisdom to attain our goal of sustainable water/wastewater management. He pointed out the cost for implementing new technologies which is not high e.g. in case of sewerage & sewage treatment systems for a population of 5 Lakh having centralized as well as decentralized systems cost only Rs 3/person/day, which is achievable. Thus he concluded by saying that it's the mindset which needs to be changed rest will fall into place.

**Dr. Joyashree Roy, Jadavpur University** talked on the **efficiency and equity in urban water access**. She shared her vast experience and a case study of Kolkata and pointed out the increase in water demand which is causing a decrease in water quantity and its quality. She emphasized that under the present scenario there is more and more water related stress and also future uncertainty. Thus the question is how to reduce the risk and resilience building. She highlighted the irony in which the beneficiaries of the piped water service are not ready to pay more as they believe it's their right. Thus there is a need to have a multi approach strategy and accountability of service provider. She explained the need to go for volumetric water charges similar to electricity, telephone and transport charges.

**Prof. Somnath Sen, IIT-Kharagpur** discussed the **Water sensitive planning guidelines at residential cluster level**. He pointed out that the actual crisis is not about having too little water to satisfy the needs but it's of managing water so badly that billions of people and the environment is suffering. He mentioned that according to the traditional water management technique the strategy is '**big pipes in - big pipes out**' which is not possible to work in the present scenario.

The need of the hour is to move towards a new approach for sustainable water/wastewater management, which can be achieved by doing RWH; using storm water as a resource and reducing the runoff; reuse and recycle of waste water and increased system efficiency at utility level. He explained the sustainable water management with the help of a case study done by his team in Medinipur town of West Bengal. He concluded by emphasizing on the control of imperviousness, as in urban cities impervious-to-pervious ratio is high.

**Dr. Arup Kumar Sarma, IIT- Guwahati** talked about the **Ecological and energy efficient practices for storm water management**. He stressed on the need for optimal ecological management practices such as watershed management to reduce runoff and sediment flow and to have efficient water management. He stated that the use of grass and herb will help in efficiently control sediment flow from 65-100% and 38-97%, respectively. He also highlighted the need to have RWH and the measures needed in this direction as it will not only help in groundwater recharge but will also help in reducing floods.

**Dr. Regina Dube, GIZ, India** underlined the support GIZ is providing to Ministry of urban development towards the preparation of city sanitation plan (CSP) in six cities namely Shimla, Varanasi, Nasik, Raipur, Kochi and Tirupati through a new programme called '**Support National Urban Sanitation Policy Program (SNUSP)**'. She stated that the programme involves support in CSP implementation, preparation of State Sanitation Strategies (SSS) and up scaling of activities under National School Sanitation Initiative (NSSI). She underlined that the programme ensures holistic urban sanitation improvement in selected cities which focuses not only in asset creation of sanitation related infrastructure through technical advisory but also gives a strong emphasis on refining city database, ensuring inclusiveness through various participatory approaches; developing/streamlining various institutional and legal frameworks and converging with other national/state level urban infrastructure development projects. She highlighted the overall goal of SNUSP, which is to transform urban India into community driven, totally sanitized, healthy and livable cities and towns.

### **Session 3: Technical Discussion: Operational challenges and strategies for mainstreaming reforms in NURM projects**

**Prof. R.K. Panda, IIT-Kharagpur** discussed some case studies of Rainwater Management in Urban and Industrial Catchments. He also talked about the use of RWH in ground water recharge and reduction in surface runoff. He concluded by saying that a permanent solution to water shortage problem of future could be attained by efficient and sustainable water management.

**R.M. Chatterjee, DGO, KMDA** discussed about the urban water supply management situation in the Kolkata metropolitan area. He said that in this area they have been able to attain the water quality norm

according to the WHO and thus supply water 24x7. However the water supply pattern is intermediate. He pointed out the need to improve the operation and maintenance of the water plants as the length of pipes is long and have joints which increases the chance of contamination for which the authority have to go for water quality test which in turn is a costly affair. In order to attain a sustainable water management it's important to go for metering system.

**Bibhas Maity, DG (Water Supply), KMC** gave an overview of the **current scenario and future vision for water supply in KMA**. He said that the land space is a problem in Kolkata due to which we can't afford to have huge conventional treatment plants. Thus it's important to have awareness among the people so that the amount of water consumed may be reduced which would in turn reduce the water demand. He also stated the need to go for volumetric water charges.

**Prof. Madhushree Majumdar- NIUA (Retd.)** highlighted the water supply state of affair and need for neighborhood planning in KMA. According to her, the need of the hour is to go for integrated neighborhood planning. She emphasized the need to spread awareness among people about it and a policy for decentralized neighborhood management needs to be made.

**Dr. Mohit Roy, Head, Vasundhara Foundation** talked about the understanding of urban waterbodies before starting of their management. He gave a brief history of the ponds in Kolkata stating that Kolkata is called as '**the city of ponds**'. However there is no proper documentation of these ponds as in 2006 KMC listed 3874 ponds; in 1997 there were 1736 and now there are 4400 to 5400 ponds. He said that urbanization is our future but it's unplanned as the urban India depends heavily upon various types of waterbodies to meet its daily requirement of water. He highlighted that the wetlands and ponds have various important functions to play in the society, culture, economy, environment and wastewater treatment. He stated that all the government plans for development of Kolkata has bypassed the existence of these thousands of ponds. None of the universities and technical institutions of Kolkata has done any meaningful studies on these vital water resources. In the last two decades the major environmental movement in and around Kolkata has been the movement to save the waterbodies taken by community organizations, but there has been no external funding: no central or Foreign NGO intervention. He underlined the need for various stakeholders to work in hand in hand to resolve the problem.

#### **Session 4: Mainstreaming energy & resource efficiency in sustainable wastewater treatment**

**Prof. Arunabha Majumdar, Emeritus Fellow- Jadavpur University** talked on bacterial reduction in waste water treatment system. He said that while testing the wastewater it's important to check the

bacterial quality too as these pathogens present in the sewage effluent can result in diseases such as diarrhea, dysentery, typhoid, infected hepatitis, etc upon exposure to the contaminated water. He highlighted that in Indian scenario the organic pollutant (measured as BOD/COD/SS) removal performance for conventional technologies employed in a majority of STPS under GAP/NRAP have been extensively studied and reported, but the microbial pollutants removal performances are not getting monitored properly. Thus he stressed on the need of developing new strategies/systems to bring down the *Fecal coliform* count along with reuse and recycle of wastewater and spreading general awareness about it to the masses. He reported that the level of *Fecal coliform* should be 2500 MPN/100ml in the treated wastewater specific to the stretch of the river Yamuna in Delhi which is in accordance with the Ministry of Urban Development and Poverty alleviation, Government of India norm.

**Dr. R.C. Srivastava, Head- Department of Sanitation and Sanitary Engineering, All India Institute of Hygiene and Public Health** stressed on the need to improve the operation and maintenance in the water treatment plants of KMA in order to attain efficient water quality management. He said that the functionaries need to work towards the operation and maintenance of the treatment plants as it's an important factor for attaining sustainable and efficient wastewater management.

**Indranil Bhattacharya, MD- Unitech Water Technologies Pvt Ltd.** gave a presentation on **Sustainable wastewater treatment using different aerobic & anaerobic treatment technologies and on the introduction of environmental balance improvement device**. The focus of his talk was on the need of bio augmentation for urban wastewater management as it helps in enhancing BOD removal, preferential degradation of specific compounds, control in *E. coli* levels, odor reduction. He talked about the new technology which they are collaborating with a Japanese company. The technology will be able to act on lakes and ponds and reduce the bad odor, reduce the sludge generation to 25% and can be used in oil, septic tanks and grease. Also he stated that the technology will be efficient in reducing the *Fecal coliform* to a greater extend in the STPs.

#### **Vote of thanks by Arup Kumar Saha, CEO, KMDA**

Mr Saha thanked all the speakers and remarked that the ULBs have learnt a lot about the urban water/wastewater management. The ULBs have got a scope and should implement the key points in their DPRs and should also try to rectify the mistakes as there is a scope for the new paradigm to evolve.