

**ICRIER's Program on Capacity Building and Knowledge Dissemination on Urbanization
in India: *Preparing for the Urban Challenges of the 21st Century***

Delhi National Workshop

February 8, 2013

Summary of the Proceedings

Participating states: National

Focus: Service Delivery of Water and Sanitation:

Challenges faced by Metropolitan Cities

Inaugural Session: *Setting Out the Challenge*

Dr. Isher Judge Ahluwalia Chairperson, ICRIER welcomed all the participants and stated that ICRIER board had endorsed urbanisation to be one of the core themes with focus on three components - knowledge dissemination, capacity building and research. HUDCO-sponsored programme on urbanisation and HUDCO Chair at ICRIER headed by Prof. Meenu Tewari. Capacity building was seen as mutual building of capacity through sharing and incorporating in research gathered knowledge from urbanisation programmes implemented in our cities and towns. Of the seven areas identified for research one has been water and sewerage. The she specially mentioned that Dr. Smita Mishra from the World Bank, to share international experience and Ms. Malini Shankar to share on Maharashtra Sujal Nirmal Abhiyan in Maharashtra and cities in Andhra Pradesh, Vijayawada and Vishakhapatnam, used IT and SCADA and had successfully reduced their nonrevenue water. The presentations were followed by intense discussion. Very involved participation by audience was indicated.

Mr. Kartik Misra team member , ICRIER Delhi

1. He highlighted Challenges in Service Delivery of Water. He stated that due to rapid urban growth and rising incomes led to greater demand of water, higher consumer expectations on the quality of services delivered.
2. Assumed to need more investments but not necessarily so. It could be done in financially viable and environmentally sustainable manner.
3. There were three stress points, increasing financial stress, environmental stress and waste management.
4. Financial stress resulted from rising energy costs and the unwillingness to raise user charges. Rising environmental stress was due from inadequate investment

in sewerage treatment and solid waste management. Necessary conditions were Autonomy, accountability, and market orientation.

5. How do India's metropolitan service providers compare against these criteria? Answer to this question was the focus.

Dr Smita Misra, Senior Economist, World Bank India office, Delhi

1. She cited examples from different Asian cities' water utilities. Public Utilities Board, Singapore managed to turn around the water supply and sewerage situation. Being an island water was scarce. The utility managed water treatment quality, efficient supply, and recycling water through autonomy. The utility had autonomy to define pay scales, to hire and fire staff and retention was based on their capabilities and the promotions were based on performance. Public Utility Board was a very good example of most efficient, accountable, customer oriented utility that reduced non-revenue water to the minimum levels and increased the coverage of 24x7 water supply to 100% customers.
2. Phnom Penh improvements were in service delivery through financial autonomy. Independent operations tariffs based on costs, restructured management, transparent system of performance incentives and penalties were installed. Bills collection was maximized, non-revenue water reduced. It improved the revenue without actually increasing costs by maximising the database and collection efficiency. They Achieved non-revenue water reduction from 72% in 1993 to less than 6% in 2010 and sustained it. Collection efficiency increased from 48% to 100% in 2010, in seven years. Connections increased from 27,093 to 202,000 in 2010 and water supply increased from 10 hours to 24 x 7 water supply and was being sustained,
3. Ho Chi Minh City, Vietnam, was based on a performance-based leakage contract which was entered with a private company. Water supply, in August 2010, was 13,049 M. Cu. (cubic metres) a day and after the contract, October 2011, 6432 M.Cu. Consumption per day actually reduced a little bit from 3637M. Cu. to 3533M.Cu Pressure increased dramatically from 2M. Cu. to average pressure of 8 M. Cu. Non-revenue water volume, per day, reduced dramatically from 9412M. Cu. to 2899 M. Cu. and the non-revenue water percentage reduced from 72% to non-revenue water percentage of 45% after October 2011.
4. Phnom Penh, Cambodia got the Magsaysay Award in 2006 and the Stockholm Industries Award. It was also declared the best utility town with the maximum reduction in non-revenue water, which helped further incentivize and maintain the lower leakages.
5. Manila, Metropolitan Water Works and Sewerage System were privatized. Promoting autonomy, accountability, customer orientation and market orientation. That worked. Tariffs were increased from 4 to 8 per M. Cu. Awareness created with the customers reduced resistance. Efficiency improvements alone were enough. International tendering and performance bond to guarantee concessionaire obligations ensured service delivery happened as per the agreed indicators.

6. As a Utility can enter into multiple PPP then a regulator becomes necessary. Performance monitoring benchmark. with multiple service providers who were accountable for the services was the typical Brazil model. But there was no clear cost advantage for size of the city, it could work both ways.

Session I

Mrs. Debashree Mukherjee CEO, Delhi Jal Board, Delhi

1. Delhi Jal Board (DJB) provided water and waste water utility for about 17 million people. It produced 830 million gallons per day and supplied bulk water to NDMC and Delhi Cantonment Board, and retail supply to rest of Delhi. 75% households in Delhi have in-house pipe water connections the rest use borewells and tankers.
2. Important challenge for Delhi were inequitable supply ranging from 300 lpcd to 50lpcd combined with unplanned growth and non revenue water. Over last 7 years 1600 colonies that were regularised, and 900 got piped water supply with great difficulty.
3. Of total 19 lakh consumers, 75% of them are metered, but a large number of non-functional meters. Monsoon are arriving later and could be due to climate change led to disputes over interstate water sharing agreements.
4. Three pilot projects for three very diverse areas in Delhi with 24 x 7 water supply were operational in Mehrauli-Vasant Vihar, Malviya Nagar, and Nangloi. each of these three contracts have been structured differently. First provided increased hours of supply but not 24x7, second gets 27x7 water supply while third was to provide 40 MGD treatment plant based water 24x7. These were pilots if they succeeded they could be scaled up.
5. The tariffs from the pilot areas went into an escrow account managed by the Delhi Jal Board and the operator would get paid based on the NOR on amount billed and collected subject to performance criteria based on benchmarks.

Mr. Satish Jain Executive Engineer, PHED, Jaipur

1. Jaipur City was a very old city and extremely water short with very few ground sources as well as surface water sources. There were no perennial rivers and large bore-wells constructed in the city on a local nala bed, it was called Amanishah Nala. Bulk of water came from Ramgarh Lake.
2. Water was provided every day for duration of 1-1/2 to 2 hours. Old walled city area had no reservoir so water was pumped over 5 km. Hence 2800 tanker trips per day would transport water in Jaipur City. Fitting them with GPS system allowed for efficient monitoring and reduced tanker trip requirements to 1000 tankers per day.

Ms Malini Shankar Former Principal Secretary, Water and Sanitation Department, Maharashtra

1. A very detailed and vivid account of the practical implementation of the Maharashtra Sujal Nirmal Abhiyan. Abhiyan Campaign was elaborated by her. Incentive was given to all the ULB in the state by providing 100% funding provided they implemented the reforms.
2. There were two phases to the reforms. First was a detailed household survey, along with water and energy audits, superimposed on GPS mapping to create a solid database.
3. Second phase was conducting 24 x 7 pilots, identifying sustainable sources, reaching 80% metering and tariff framing, solid waste management, ODF cities. It took two years to implement it in just 152 cities.
4. Action they had to take included detecting the illegal connection and regularize, increased the revenue due to water audits, assessment of non revenue water and reduce the leakages, thus reducing overall expenditure.

Session II

Dr Smita Misra, Senior Economist, World Bank Chaired both the sessions II and III, that followed. Four presentations Chennai, Ahmedabad, Bangalore and Hyderabad indicated rise in area to four times the size of old city and population leading to gap between demand and supply, the source sustainability and multiple sources, volumetric billing difficulty. But reuse of waste water and sewage treatment to often tertiary levels for reuse was becoming common. Dealing with old areas, and a 30% to 40% gap between the revenue and the cost was indicated and 70% of revenues went for paying electricity bills. A very rigorous experience sharing resulted at the end of the session from other participants from other states.

Mr. A.L. Radhakrishnan, Superintendent Engineer, Chennai Water & Sewerage Board

1. Chennai City was geographically on a flat plane with no perennial rivers for providing drinking water. The city had expanded from this 180 sq. km. to 426 sq. Km. and population was to 6.73 million. Once every five years the city faced draught. Drinking water was bought to the city from over 200 km.
2. Challenge was managing the multiple sources non perennial sources of water. Hence non-conventional method of desalination of sea water using PPP was used for augmenting supplies. Currently one Plant was fully functional and another on the way. But desalination was an expensive project.
3. Inadequate carrying capacity for water after being treated required the city to adopt a ring and radial distribution approach with multiple water distribution stations.

Mr. Dharmendra Herma, Assistant Municipal Commissioner, Ahmedabad

1. Ahmedabad city over last few years grew from it has grown from 196 to 466 Sq. Km. Also had surface water sources from river dams, that went into four major water treatment plants.
2. 143 Water distribution stations were at ward and zone level, and per capita water supply is 140 to 160 LPCD but unevenly distributed.
3. Three major water treatment plants currently produced 1800 MLD more than the current demand for it. Sewerage flows from the source to sewerage network, sewerage pumping station to main canal then treatment plant and into the river after meeting all parameters of water quality, with the capacity to treat projected sewage for 2021.
4. Interlinking lakes or water bodies and connecting them to storm water drains was a new initiative by AUDA.

Mr. V.C. Kumar Executive Engineer, Bangalore Water & Sewerage Board

1. Service area of Bangalore Mahanagar Palika had increased from 229 Sq. Km. to 800 Sq. Km. in 2006. Cauvery river over 100 km. was the only major source of drinking water for the city and it was pumped at three stages and over 170 meter overhead.
2. Bilateral funding to BWSSB had created a ground level reservoirs for the sewage in the city and sewerage system, with 11 treatment plants of total capacity of 339 MLD including the rehabilitation of the existing sewers and procurement of jetting machines for cleaning sewage pipes.
3. They had provided 73 MLD of tertiary treated sewage water for Lal Bagh and Cubbon Park gardens, but ideally 135 MLD ought to be used.

Ms. J. Syamala Rao MD, Hyderabad Water & Sewerage Board

1. Population of 90 lakhs was covered by the Greater Hyderabad Municipal Corporation, covering 500 Sq km of area over the original core area of 172 sq km.
2. Three lakes and two river projects provide about 340 MGD of drinking water to the city. River water had to be pumped overhead of 400 meters. Production costs further increased as pipelines carrying water cover over 190 km distance and local settlements demand a share.
3. Sewage treatment was a major problem and small sized STPs were encouraged along with water recycling for industries and other non-portable uses.
4. Over last 7 years there was a two meter fall in ground water and rain water harvesting structure was now compulsory for new constructions.

Session III (500)

Jatin Shah City Engineer, Surat Municipal Corporation

1. Besides the drinking water sector reforms implemented by Surat Municipality it had created these pioneering sewage gas based power plants in 2003. That saved money in power bills.
2. SCADA a computer system for gathering and analysing real time data for sewage network. All the processes, all the treatment plant and the sewage pumping station, they are linked together.
3. Another PPP initiative, for a large cluster of textile processing unit to treat 140 MLD industrial effluent through a CETP. Tertiary treatment of waste water was achieved in the plant for water reuse.
4. Future plans were to have sewage tax against open defecation

V.G. Kulkarni Pune Municipal Corporation

1. He said Pune's with 4 million population was growing at 30%. But had no problem with water source. 70% of the total water required by the city came from cross conduit and 30% from open channel. 300 LPCD was average water provided but not uniformly as the city geography was in a shape of a saucer, where core city got more water and the fringes less.
2. City was in the process of preparing a remodelling plan, to bring the leakage to less than 15% and 100% metering.
3. Consultants were to plan manage implement projects, train PMC engineers create public awareness through camps and supervise through O&M period of the contract.
4. Currently more than half the sewage was treated while the rest was let into the river. Housing schemes with more than 150 tenements had to set up STPs and reuse treated sewage for flushing, gardening etc. currently 500 MLD of treated sewage was sent for irrigation. Rain water harvesting was mandatory.

R.B. Baamle, Deputy Municipal Commissioner, Mumbai

1. He highlighted two major problems, one of servicing slums and second utility mapping. With a population of 12.5 million and present demand of 4200 MLD they supplied 3500 MLD with 3,66,000 connected and revenue of Rs. 784 crore of revenue generated.
2. For slums automatic meter reading did not work and digging for sewage underground was a huge challenge, digging under railway lines was even a bigger challenge and needed trenchless technology.
3. Mixed locality was another issue and yet they had experimented with 24x7 water supply in eastern suburbs.
4. City sanitation map was in the making to match the need of toilets for all.

P.K. Mukherjee, Addl. Chief Engineer, Kolkata Metropolitan Development Authority

1. Kolkata Metropolitan Area which was the largest agglomerate in Eastern India. KMDA completed projects and O &M was managed by the ULBs.
2. Hugali river passed through the city and had 18 treatment plants for sewage. The sewage of Kolkata proper was treated in wetland and utilised outside the city for fish culture or cash crop production.
3. NGRB programme collected sewage from every residence and treat it as per CPCB norms and discharge it to River Hugli.
4. 2025 vision was to stop total supply of ground water and supplement it by treated surface water. One 24 x 7 water supply scheme of 155 MGD was already started, but the presenter expressed doubts about its success because of common stand posts in that ward.

After a rigorous interaction from other participants the workshop was concluded by Dr. Isher Judge Ahluwalia. She said that whole programme has been funded by the Ministry of Urban Development. The proceedings of every workshop along critical points that emerge world shared with them and suggest ways to keep the critical points in policymaking process as the program moved forward. She wrapped by saying that this was a very fast-moving sector and the conversation must be kept alive and running. Thanked her team and participants.