Workshop on Economics of Non Domestic Water use in Karnataka

Date	Tuesday, August 6, 2019
Time	10.00 AM – 1.30 PM
Venue	ITC Windsor Manor, Bangalore
Participants	Senior Managers engaged with water management in Corporates and Institutions
Objective	To capture economics of usage, treatment and reuse of water in non domestic sector, and seek appropriate technological and economic framework for Private Sector engagement in non-domestic use of water

Background

Water in the State of Karnataka is a stressed sector. Major areas of demand on water include 122.76 lakh ha of gross cultivated area in Agriculture, 19 million Households in 67 Class I and Class II Urban Centers, and 167 Industrial Areas in Karnataka. A Key Hydro Economic Analysis by 2030WRG (Water Resources Group) observed that with existing efficiencies at which the state is operating, growth will lead to almost doubling of the amount of water required by 2030 as compared to existing demand of 885 TMC (2011). Population growth and increasing urbanization are expected to lead to a rising urban water demand-supply gap in Karnataka from 24% (2011) to 58% (2030). Further, the total demand of water in the industrial sector is projected to increase more than three times from about 26 TMC/year in 2011 to 85 TMC by 2030, resulting in a 69% water demand-supply gap in 2030. In this context, though share of water usage by industry is small compared to agriculture and domestic, it is critical to the development of industrial and service sectors.

The workshop was jointly conducted by Sri. L V Nagarajan 2030 WRG and moderated by Prof. G Ramesh, Center for Public Policy of IIM Bangalore.

Workshop Design

The half-day workshop was designed to facilitate critical understanding of economic use of water by non-domestic sector and arriving at an economic framework for approaching the solution for economic use of water, especially treated water. The agenda and sessions schedule at the workshop is at Exhibit – I.

The workshop included presentation on practices of economic use of water by non domestic sector in Karnataka, followed by a panel discussion on the economic framework for water and value chain of water. The presentations at the workshop covered,

1. Success stories of economic water use by the Private Sector in Karnataka,
2. Cost benefit of successful stories of water treatment and conservation,
3. Suggestions for Policy, Fiscal and Procedural support to the Private Sector for implementing water effective solutions in Industrial activities,
4. Presentation on framework for water market and pricing,
5. Catalytic role that the Industrial Bodies can play in Water Conservation.
6. Framing agenda for engaging with industries and policy making bodies

The panel discussion at the workshop was chaired by Shri. Anjum Parwez, I.A.S, Principal Secretary to the Government, Urban Development Department and co-chaired by Smt. Gunjan Krishna, I.A.S, Commissioner for Industries, Karnataka. The panel discussions, while reflecting on economics of water, also discussed opportunities to enable the participants to understand:

1. Framework for water developing and regulating markets,
2. Models of Investment, financing and Cost structure of water conservation at organizational and institutional level and cluster level depending on appropriate technology from diverse product markets.
3. Designing viable financial models in the water sector at firm / institutional level and cluster level, in terms of market creation, Viability Gap Funding, and Funding Models, keeping in mind in various risks.

Summary of Workshop discussions

Facilitated through a rich array of presentations by the private sector from diverse domains, the workshop focused around technology in use, economics of water management, and policy implications for government. These included,

- Ongoing efforts by Government of Karnataka to provide water for industrial growth,
- Conscious measures taken by companies to optimize use of raw water and recycled water,
- Strategies of Zero Discharge of water, rain water harvesting, tight monitoring usage, strict compliance to environmental laws, and community service.

The programme started with panel presentation and discussion by experts from institutions,

Dr. Shivashankara, I.A.S, Chief Executive Officer and Executive Member (CEO & EM), Karnataka Industrial Areas Development Board (KIADB) reiterated the government efforts to provide water for industrial areas, and emphasized the urgent need for collaborative effort for prudent water use and reuse, particularly in light of shortage of water faced in industrial areas in Karnataka.

Shri. A K Vishwanath Sharma, Toyota Kirloskar Motor Private Limited, which has a legacy of water management, while elaborating the (ZLD) Zero Level Discharge practice followed at its plants, explained the steps followed at every stage for reduced water consumption involving innovative manufacturing processes, and implementation of water saving projects through CSR (Corporate Social Responsibility) funds.

Shri. K G Rajeev, Tata Coffee Limited, as an example of planation and food processing unit, presented the water conservation efforts at their plantations as well as manufacturing plants, including Rain Water Harvesting techniques, use of improved technologies to minimize water consumption, and improved soil water retention through use of canopy, mulching, compost application, etc.

Dr. R T Srinivas Rao, Jindal Steel Works Limited, which is a large manufacturing unit as well as a township, explained the strategies for sustainable water conservation, including cascaded use of water within processing units, efficient re-circulation systems, water recovery, Reverse Osmosis (RO) plants, and reduction of evaporation loss in water ponds. He also described the projects taken for greening and community service.

Shri. Prasanna Venkatesh, Sobha Limited, member CREDAI (Confederation of Real Estate Development Association of India), elaborated on challenges and outlined the benefits of a robust policy for waste water reuse for efficient urban water management in the context of residential complexes.

Shri. ETA Srinivasulu, MSEZL (Mangalore Special Economic Zone Limited), presented revenue and cost model, and the key success factors for sustainability of the business model at MSEZ Waste Water Reuse Project. They also manage water treatment of municipal area and he explained how they manage the SEZ along with the municipal administration.

Shri. Kiran Kumar, explained various technologies that are appropriate for various applications; and Capital expenditure , Operation and Maintenance (O&M) costs. He also presented examples of success stores in ZLD and WWR at manufacturing plants in Karnataka.

Dr. Anurag Priyadarshi, from Tata Global Beverages, elaborated on the importance of quality water management, and steps that need to be taken by industrial manufacturing units to ensure safe water discharge into natural water streams for long term environment safety and water security.

The panel presentations were followed by discussions headed by Shri Anjum Parwez, I.A.S, Principal Secretary to the Government, Urban Development Department, Karnataka,

Shri. Anjum Parwez, I.A.S, explained the thrust of the Government to ensure adequate water for industrial development while at the same it expects the corporates to optimize on the water management. He stressed increasingly availability of water will become a competitive factor in attracting industries. He elaborated on the need for higher sensitivity of the Industries to challenges related to water, and the steps by Government of Karnataka, including the Karnataka Urban Waste Water Reuse Policy that stipulates the use of atleast 30% of treated water by industries by the year 2020, and the vision to make use of 100% of treated water by the year 2030.

Smt. Gunjan Krishna, I.A.S, Commissioner for Industries, highlighted the criticality of water resources for industrial growth, and identified several solutions and best practices for improved water security, including Common Effluent Treatment Plants, Catchment area / roof top water harvesting, watershed management, and PPP (Public Private Partnerships) for collaborative success in water saving projects. She also welcomed suggestions for Non Domestic Water Policy.

Key outcomes and way forward

The discussions in the workshop gave good understanding of the technology in use, economics and current practices of water management; and critical insights for strategizing for corporates and policy inputs for government. It has given areas of engagement for Government and Corporates ro engage. Key consensus emerged towards criticality of water for industrial purpose even after considering all the water management technology; and appropriate economic models for effective policy implementation. Some of the themes that emerged for future directions are:

- Framework for appropriate financial models for water management in non domestic and especially industrial sector,
- Worskhsop on appropriate technology and practices for different industries, segments, and clusters
- Approach paper / Policy Input for economics of urban-industrial water,
- Research and a similar Workshop on economics of water in agriculture and domestic sector including real estate

Participant Profile

The Workshop included Senior managers from Private Sector Companies active in the Agriculture, Urban and Industrial activities and Institutions in Karnataka. While facilitating cross-sectoral experiential learnings, the Workshop stimulated conversations for the private companies to identify solutions for value-driven approaches in Industrial use of water in Karnataka. The list of participating industries at the Workshop is at Exhibit – II.

About Centre for Public Policy – Indian Institute of Management Bangalore

The Centre for Public Policy (CPP) at the Indian Institute of Management Bangalore (IIMB) is an independent public interest-oriented policy think tank engaged in pioneering research, teaching, training and capacity-building. The Centre – established in 2000 through a partnership agreement between the Department of Personnel and Training (DoPT), Government of India (GoI), United Nations Development Programme and IIMB – aspires to lead policy-thinking and praxis in India, promoting equitable, inclusive and sustainable solutions to the concerns of citizens and public governance.

The twin objectives of the Centre to influence policy discourse and improve governance are achieved through rigorous research and stakeholder engagement across domains. Its strong evidence-based research has focused on government innovations, regulation, policy-making, administrative and organizational reform, public-private partnerships and IT in government.

The Centre's work in various areas of public policy is continuously being strengthened through robust collaborative networks and partnerships with a variety of think tanks, policy professionals and practitioners around the world. CPP has a significant presence in IIMB's Post Graduate Programme in Public Policy and Management. Additionally, it also conducts various innovative and influential executive programmes. A vibrant academic ambience for scholarly engagement has helped CPP emerge as a platform for ideation, debate and exploration.

About 2030WRG (Water Resources Group)

Hosted by the World Bank Group, 2030WRG (Water Resources Group) is a not for profit global partnership that brings governments, international financial institutions, nongovernmental organizations, and companies together to work towards a water-secure future. Working in close to 12 countries, 2030WRG promotes the sustainable management of water by fostering partnerships, facilitating open discussion, and driving change in the water sector.

As secretariat to the Karnataka Multi Stakeholder Platform Steering Board (Karnataka MSP – Water), 2030WRG has been collaborating with several departments of Karnataka, to explore and identify mechanisms for efficient water resources management. The three Workstreams under the Karnataka MSP – Water, viz. Agri-Water, Urban-Water and Industrial-Water, have been deliberating on issues and solutions for improving water use in agriculture, urban and industrial sectors. In line with the policy for use of treated water in urban centres approved by the Government of Karnataka in December 2017, policies and programs for use of treated water for agriculture and industries is under process. 2030WRG has been working towards prioritizing challenges in the water sector, with particular focus on identifying solutions to reduce the water demand in the Karnataka state. This includes collaboration with the WRD for establishing market linkages for the Ramthal Project, Drip Irrigation in Sugarcane, with the Urban Development Department (UDD), for implementation of the policy for reuse of wastewater for Urban areas, and with the Commerce & Industries Department for circular economy solutions for use of water in Industrial Areas in Karnataka.

Other prospective 2030WRG Workstream themes under consideration include (a) paddy sector water footprint reduction; (b) restoration of urban water bodies in Bangalore; (c) integrated watershed-soil moisture-market development; and (d) PPP solutions for irrigation command areas.

Exhibit – I: Agenda – Workshop on Economics of Non Domestic Water

10:00 – 12:15 PM: Workshop Presentations

1. Private Sector Contributions to water conservation,
2. Concerns of the Private Sector for implementing water effective solutions in Industrial activities,
3. Catalytic role of the Industrial Bodies in Water Conservation.

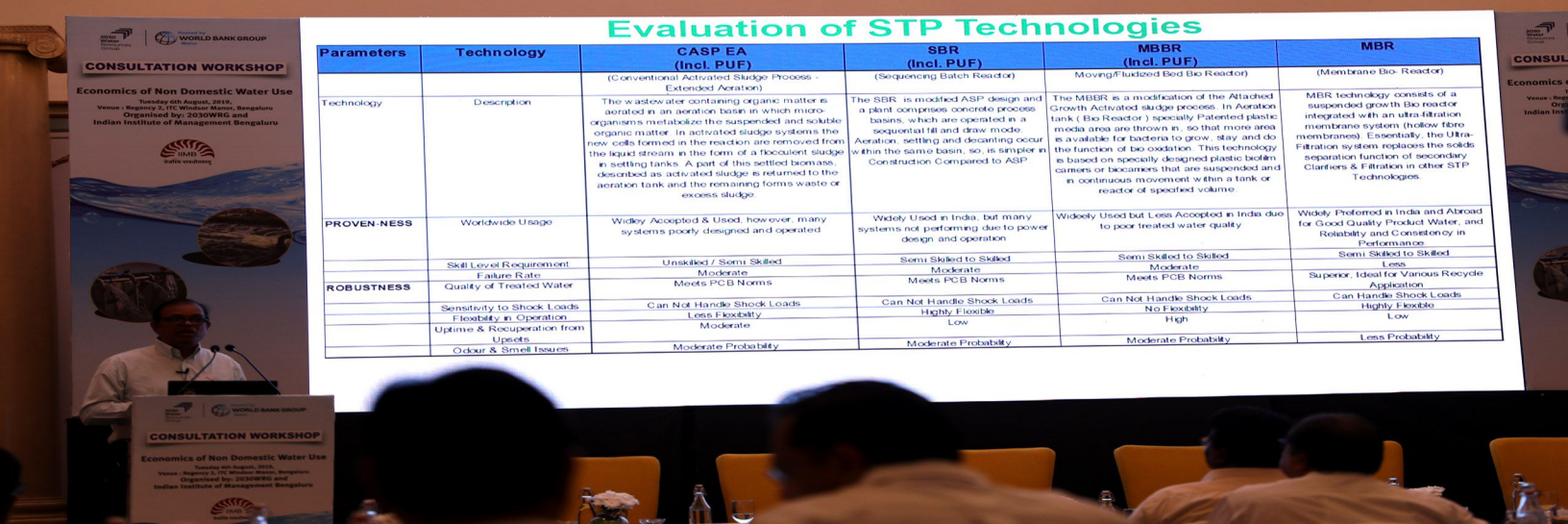
10:00 – 10:05	Welcome – L V Nagarajan, Senior Advisor, 2030WRG
10:05 – 10:15	Introductory Remarks – Dr. Shivashankara, I.A.S, CEO & EM, KIADB
10:15 – 10:30	Circular Economy Solutions in water - Toyota Kirloskar Motors
10:30 – 10:45	Sustainable water conservation practices - Jindal Steel Works
10:45 – 11:00	Water Quality Management practices - Tata Global Beverages Limited
11:00 – 11:15	Viable STP models – Price Waterhouse Coopers
11:15 – 11:30	Urban Waste Water – Sobha Limited
11:30 – 11:45	Waste Water Reuse Business Models - Mangalore SEZ Limited

12:15 – 1:30 PM: Reflection session

1. Framework for water markets,
2. Prospects of financial innovation models in the water sector,
3. Business cases and risks in water management – Decision Support Systems for Business and Investment Planning in water sector,
4. Costs, Pricing and Value.

12:15 – 12:30	Overview Presentation: Prof. G Ramesh, IIMB
12:30 – 13:15	Panel Discussion Presentation/Talk by Panel Members 1. Anjum Parwez, I.A.S, Principal Secretary, Urban Development (Panel Chair) 2. Gunjan Krishna, I.A.S, Commissioner for Industries, Karnataka 3. A K Vishwanath Sharma, Toyota Kirloskar Motor Pvt. Ltd. 4. Anurag Priyadarshi, Global Sustainability Manager, Tata Global Beverages Ltd. 5. Prof. M S Mohan Kumar, Indian Institute of Science, Bengaluru 6. Kiran Kumar, Consultant – Price Waterhouse Coopers 7. Moderator: Prof. G Ramesh, Centre for Public Policy, IIMB
13:15 – 13:30	Wrap up

01:30 – 2:00 PM: Lunch



Parameters	Technology	CASP EA (Incl. PUF)	SBR (Incl. PUF)	MBBR (Incl. PUF)	MBR
		(Conventional Activated Sludge Process - Extended Aeration)	(Sequencing Batch Reactor)	Moving/Fludized Bed Bio Reactor)	(Membrane Bio- Reactor)
Technology	Description	The wastewater containing organic matter is aerated in an aeration basin in which micro-organisms metabolize the suspended and soluble organic matter. In activated sludge systems the new cells formed in the reaction are removed from the liquid stream in the form of a flocculent sludge in settling tanks. A part of this settled biomass, described as activated sludge is returned to the aeration tank and the remaining forms waste or excess sludge.	The SBR is modified ASP design and a plant comprises concrete process basins, which are operated in a sequential fill and draw mode. Aeration, settling and decanting occur within the same basin, so, is simpler in Construction Compared to ASP.	The MBBR is a modification of the Attached Growth Activated sludge process. In Aeration tank (Bio Reactor) specially Patented plastic media area are thrown in, so that more area is available for bacteria to grow, stay and do the function of bio oxidation. This technology is based on specially designed plastic biofilm carriers or biocarriers that are suspended and in continuous movement within a tank or reactor of specified volume.	MBR technology consists of a suspended growth Bio reactor integrated with an ultra-filtration membrane system (hollow fibre membranes). Essentially, the Ultra-Filtration system replaces the solids separation function of secondary Clarifiers & Filtration in other STP Technologies.
PROVEN-NESS	Worldwide Usage	Widley Accepted & Used, however, many systems poorly designed and operated	Widely Used in India, but many systems not performing due to power design and operation	Widely Used but Less Accepted in India due to poor treated water quality	Widely Preferred in India and Abroad for Good Quality Product Water, and Reliability and Consistency in Performance.
ROBUSTNESS	Skill Level Requirement	Unskilled / Semi Skilled	Semi Skilled to Skilled	Semi Skilled to Skilled	Semi Skilled to Skilled
	Failure Rate	Moderate	Moderate	Moderate	Less
	Quality of Treated Water	Meets PCB Norms	Meets PCB Norms	Meets PCB Norms	Superior, Ideal for Various Recycle Application
	Sensitivity to Shock Loads	Can Not Handle Shock Loads	Can Not Handle Shock Loads	Can Not Handle Shock Loads	Can Handle Shock Loads
	Flexibility in Operation	Less Flexibility	Highly Flexible	No Flexibility	Highly Flexible
	Uptime & Recuperation from Upsets	Moderate	Low	High	Low
	Odour & Smell Issues	Moderate Probability	Moderate Probability	Moderate Probability	Less Probability

Exhibit – II: List of Participating Industries – Workshop on Economics of Non Domestic Water

Organisation	Activity
• Urban Development, Government of Karnataka	Government
• Commerce & Industries, Government of Karnataka	Government
• Karnataka Industrial Areas Development Board	Government
• ITI Limited	Electronics Manufacturing
• Toyota Kirloskar Motor Pvt. Limited	Auto Manufacturing
• Jindal Steel Works	Steel Manufacturing
• Tata Global Beverages Limited	Beverages
• Tata Coffee Limited	Beverages
• Mangalore SEZ Limited	Water Treatment
• ITC Limited – Agri Business Division	Agri Business
• ITC Limited – Foods Division	Food processing
• Diageo Limited	Alcoholic Beverages
• Sobha Limited	Real Estate
• CREDAI	Industry Body
• Hindustan Aeronautics Limited	Manufacturing
• Price Waterhouse Coopers	Consultants
• Bangalore International Airport Limited	Air Traffic Services
• Indian Institute of Science Bangalore	Academia