

WATER LOSS MANAGEMENT – COMPULSORY FOR WATER SECURITY

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We all understand that water is essential for life on the planet. The essential part of everything we require – food, clothes, energy, transportation, nature, culture, social and economic development and virtually all the products used on a daily basis. With population growth and economic development driving demand for everything, the value of water is becoming increasingly apparent.



160 MLD Water Treatment Plant, Dhannaser, Rajasthan

Water wastage and mismanagement is a more serious problem than any other challenges in today's world and we need to think deeply about the challenges and work towards enduring solutions to prevent this disaster.

But water is scarce in nature and must be used very judiciously. The very existence of water is changing and becoming complex, needs new insights, strategies for real action plan to mitigate the imminent challenges of scarcity.

Creating an environment that will unleash the innovation needed to cut water consumption, reduce losses, moderate water intensive crops, upgrade aging infrastructure and make industry effective user with zero discharge can only be the solution. It is clear that the government and all other stake holders must work together to find a way of effectively complying and promoting water efficiency.

Water is Business

Water is everybody's business and a cohesive approach is needed in the society to get to the issues that really matters. Water has become a high business agenda because all businesses depend on water. The continuity and future success of any business will be greatly impacted by the availability, cost, and quality of water as it is becoming scarce, polluted, and too expensive due to rampant mismanagement. As a result of changes in human consumption, industrial usage and natural recharge systems, the water management challenges has become more complex. The prospect of water shortages, scarcities, and stresses will increase that will affect water availability, access, affordability, and quality.

The evolving scenario with complexity and scarcity encourage us to think about the three significant water challenges that will combine to impact businesses and societies everywhere. These are the efficiency challenge, the security challenge, and the interconnectivity challenge. Each of these challenges incorporates many other challenges to business that are emerging from the changing status of water.

Indian Scenario

Over one third of Indian population has become urban living in cities. The urbanization trend is growing faster than expected and set to grow to half of the population in just a matter of few years from now. With economic growth, the urbanization is putting major pressure on water supplies,



2074 Million Litres Raw Water Reservoir, Sindhanur, Karnataka

wastewater collection and treatment, water quality and public health. Aged pipelines well beyond their useful life are still in service across the country, many times breaking and leaking, interrupting service to customers and driving up costs. Waste water treatment plants built up in the past have aged and deteriorated from years of use.

With increasing population and rising consumption level, India is sooner going to be confronted with

a serious resource challenge. The available water resources have reduced significantly over the years whereas the demand keeps on escalating and projected to overtake the availability. The water demand will continue to grow and by the year 2025, it is expected to increase by over 20 percent, fueled by the industrial requirements which are projected to double from 23.2 trillion liters at present to 47 trillion liters. Domestic demand is expected to grow by around 40 percent from 41 to 55 trillion liters while irrigation will



2420 MM MS Pipeline for Bulk Water Supply in Delhi



Damaged supply line in Bengaluru



Honsur Water Reservoir, Karnataka

require 14 percent more to 592 trillion liters up from 517 trillion liters currently. The water ministry predicts that per capita water availability will reduce by 36 percent in 2025 and by about 60 percent in 2050 from the level of 2001. The NITI Aayog in its report on water management has flagged the distressing situation with respect to water. The report has suggested that almost 70 per cent of our water is contaminated. It has also identified that 600 million people face high-to-extreme water stress in the country and 75 per cent of households do not have drinking water on premises. The challenges posed by growing water requirement calls for a massive response from all stakeholders.

Non-Revenue Water

One of the major issues affecting water utilities in India is the considerable loss of water from the amount of water put into the distribution system and the actual water billed to consumers. A phenomenon called as non-revenue water (NRW), a well-known issue that results in large volumes of water being lost through leaks in supply system and not being invoiced to customers. It is a very real challenge faced by the majority of water utilities as a consequence of increased urbanization, higher demand, increased prices and ageing and dilapidated distribution networks. In India, non-revenue water level is quite high which results in huge volumes of treated water being lost during transmission and distribution that affects

the financial capability of water utilities through lost revenues and increased operational costs. A high level of NRW indicates that our water utilities are poorly managed with governance issues, lacks in accountability and technical and managerial skills necessary to provide reliable service to their citizens.

In western countries, urbanization took place when their economic conditions were improving steadily, and over a significantly longer period. The cities were planned with adequate funds and expertise to develop required infrastructure to manage their water and wastewater properly. In contrast, the magnitude of India's increasing population and levels of urbanization simply overwhelmed the financial and management capacities of the cities, including their water supply and wastewater management systems. The problems have been further aggravated because the policymakers have been interested in water-related issues only when droughts and floods occur. Once these natural disasters were over, the interest in water basically evaporated and plans made during the challenging times put to rest.

Water Loss Management

The water utilities in India are struggling to provide clean drinking water due to ever-increasing populations, expanding service areas and high level of water loss. Reducing water losses is critical to efficient resource utilization, efficient utility management, enhanced consumer satisfaction, and reduction in capital-intensive capacity addition. The costs of water service are much lower when undertaken through investments in reducing water losses rather than through investments in capital projects to augment supply capacities. The utility which has initiated and sustained water loss management programs has significantly gained in terms of financial returns and better consumer services.

An example is Bangalore water loss management project which was initiated by the Bangalore Water Supply and Sewerage Board. By using innovative technology of helium leak detection to accurately identify and locate hidden leaks in large and small pipes, SPML Infra has helped in significantly reducing water losses from 56% to 27%, thus saving of 40 million liters' potable water per day.

The saved water is being used to provide drinking water facilities to 110 extended colonies of Bangalore. In a busy city like Bangalore, executing water loss management project in central part was an engineering challenge due to very high traffic volume combined with narrow streets of thickly populated areas and business hubs. The works also executed in areas with maximum number of slums posing as a tough challenge to bring down the water loss from the existing levels to the present levels. The project has already covered major areas where 50–60 year old pipes are replaced with new pipes, leakage has been sealed and electronic district meters suitable for GSM/GPRS communication for measuring flow and pressure control are installed.

The need for water loss management is so important to operational and financial feasibility of our water utilities but it is hard to understand why efforts to improve the situation have been so limited. Cities like Singapore, Manila and Phnom Penh have successfully implemented water loss management programs to reduce NRW to below 20 percent levels. In India a few successful examples of utilities (e.g. BWSSB) and some places where serious actions for water loss management have at least started. For all water utilities in India, reducing NRW should be the top priority to follow when addressing increased demand for piped water supply.

Expanding water networks without addressing water losses will only lead to a cycle of waste and inefficiency. The high rate of NRW is also related to poor energy efficiency, since water transported in distribution system is loaded with energy through the distribution and treatment processes. Thus, energy is lost along with the water. Therefore, reducing NRW is important to overall efficiency and financial sustainability of the utilities, since it provides additional revenues and reduces costs. Although it is not feasible for water utilities to eliminate the NRW completely, even reducing it by half the current level of losses in cities appears a realistic target.

If we can achieve this much reduction, the utilities can save good amount of money every year from both increased revenues and reduced costs and can service additional population without any new



Split collar to repair barrel crack in Bengaluru NRW Project

investments in production facilities nor drawing further on scarce water resources.

In more and more states in India, the unthinkable is happening. Water scarcity has become real, long dry spell that has sent farm production plummeting, depleted and dried ground wells, dams, reservoirs, and several rivers are drying and trickling into the sand. The water distribution is also not even across the country. Gujarat and Rajasthan are among the most water deprived states with respect to rainfall and per capita water availability. They face acute water scarcity challenges as rainfall patterns are impacted by climate change. Increasing agricultural and industrial demand is placing additional pressure on dwindling water resources. Over the years, the unrestricted exploitation of ground water across the country has led to aquifers no longer being able to naturally replenish themselves. In the absence of surface water resources in major parts of the country, drinking water is drawn either from underground sources or physically transported over long distances. For such areas, water is not free, and may be even more precious than oil due to huge challenges in getting it.

Regulating Water

Water being a common resource is not properly regulated and hence subject to several market and system failures, both from the supply and user sides. With a target to provide access to sustainable water supply to the people, the water utilities can consider the following very important aspects to mitigate their water losses and manage

the vital resources in a much better way.

Equitable Water Distribution

The World Bank report found that up to 80 percent of subsidies in the country went to medium and large farmers whereas the most affected by falling water tables are the rural poor and marginal farmers who lack the means to deepen their wells and install more powerful pumps. Make regulation to delinking water rights from land rights and treat groundwater a common resource so that the over exploitation can be controlled. At the same time, start the process of recharging aquifers through both natural processes and human efforts.

Demand Management

With ever growing demand and widening gap in supply can only be controlled with appropriate pricing of water backed by legislation and institutional support. The tariff reform must be combined with water delivery mechanism that consistently works and eliminates inefficiencies such as transmission losses and theft of water. For agriculture, the ideal policy is to promote water-saving crop and adoption of new irrigation technologies. The tariff structure that truly works for domestic, agricultural, and industrial users needs to be considered

Efficiency with Technology

Water delivery mechanism should be accurate as a fully functional consumer metering system can limit drinking water wastage and enforce conservation. Bulk metering for all water sources should go with consumer metering for domestic,



industrial, and agricultural use. In the absence of a well-planned and rigorous framework, despite government's good intentions by way of policy documents, annual plans, and heavy central and state subsidies, adoption of relevant technologies by consumers and farmers are inadequate. The stringent legislation can only help streamline equipment supply by discouraging production of inefficient conventional devices.

Groundwater Management

In many states of India the groundwater withdrawal has surpassed recharge capabilities. In a state like Rajasthan with 90 percent dependence on groundwater, the water situation will soon become distressed. In many parts of the state physical transportation of water is the only solution to meet drinking water needs, an unsustainable practice. Every effort to help recharge underground aquifers across the country needs to be made, including micro watershed planning and restoration of traditional water bodies.

Improving Affordability

Improving affordability of service would require cost optimization together with cost recovery strategies. This can be done through transparent, well-targeted subsidies for the poor, both to help obtain proper connections to service and to encourage the consumption of a minimum quantity of water.

Capacity Building

Capacity building in urban water supply and sanitation sector is an important step. A professional association of service providers could play a key role in disseminating best practices, implementing full scale benchmarking, and providing training and certification for sector professionals. Training institutions would need to

adapt their programs, currently focused mainly on technical design issues, to the new needs of the urban sector. Special information programs would need to be developed for key stakeholders including local politicians, consumers, decision makers, engineers and the non-government organizations with special interest in water supply and sanitation. In the rural sector special training programs would also need to be developed to build the capacity of local municipalities and panchayats.

SPML Connect for Water

Being the leading water management companies in India promoting sustainable solutions for water and wastewater, SPML Infra has contributed immensely in developing robust and sustainable water infrastructure across the country. It has executed more than 600 infrastructure projects in areas ranging from drinking water facilities, wastewater treatment, sewerage network and better municipal waste management to smart cities, renewable energy and power transmission and distribution. The ISO 9001-2015 certified SPML Infra is also one of the World's Top 50 Private Water Companies as per Global Water Intelligence, London.

In each of its chosen areas, SPML Infra has its stamp on numerous completed and ongoing projects. In the area of sustainable water management, SPML is currently engaged in Phase III of the Saurashtra-Narmada Avtaran Irrigation Project (SAUNI Yojana), the ambitious large water supply and irrigation project envisage to provide drinking water facilities to around 39 million people across 132 towns and 11,456 villages and to irrigate 1.8 million hectare of land in Saurashtra, Kutch and north Gujarat benefiting millions of farmers. SPML Infra has earlier completed the Phase I and Phase

II of this project which was inaugurated by Hon'ble Prime Minister of India in April 2017 and March 2019 respectively.

The company is also working on urban water supply projects, including one aimed at improving the water distribution network in Delhi; six urban water supply projects in Karnataka that would serve almost two million people. The water supply augmentation project in Bengaluru to reduce non-revenue water has helped in significantly reducing water losses by 40 million liters' potable water per day.

SPML Infra has established a leading position in the treatment of wastewater from design to application of technology, construction to management and operation of sewage treatment plants, effluent treatment plants, tertiary and water reuse treatment plants, sludge treatment, bio-gas & power generation. It has constructed a number of sewage treatment plants (STP) including 240 MLD STP in Ahmadabad, 72 MLD STP in Delhi, 70 MLD STP in Nasik, and 115 MLD decentralized STPs and pumping stations as one of India's largest and first comprehensive underground sewerage system in Mira Bhayandar, Maharashtra.

The 42 MLD STP with sewerage network in Kanpur will contribute to clean Ganga mission, an important task government is keenly following.

About the Contributor

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