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NRW: THE LOST RESOURCE



Subhash Sethi
Chairman, SPML Infra Limited

Subhash Sethi is Chairman of SPML Infra Limited. In the past over four decades, he has worked passionately with his mission to create enduring value for the country. Under his leadership, SPML Infra went on to establish itself as a leading Engineering and Infrastructure Development organization with over 650 completed projects. He is recognized as industry leader and serves as Chairman in expert Committees' of industries' associations like CII, Indian Chamber of Commerce etc. His valuable contributions in infrastructure development have been recognized widely and he has received several prestigious awards.

How do you see the evolution of Indian water sector?

Water is a fundamental requirement of life. Not only a basic human need, but the availability of adequate and safe water supplements a nation's health and economy while balancing the ecosystem. India, with a current population hovering around 1.4 billion was historically endowed with abundance of water; is now facing an unprecedented crisis. The entire landscape of drinking water scenario in India is changing rapidly. The demand supply gap is rising and frequent conflicts on water are becoming more common phenomenon.

I remember in early 1980s, when we started focusing our efforts on drinking water supplies, people were skeptical

about it as water was freely available all across and nobody was thinking it to be a business proposition. The situation entirely changed over the years and are now staring a challenging water stress with over 600 million people facing extreme water scarcity. Clean drinking water that was easily available to masses has become a luxury now and remains out of reach of large number of people. Water market in India has evolved and with the new entrant, technology and growing demands, it is going to be among the largest water markets globally.

Government of India has launched Jal Jeevan Mission (JJM), a five year time-bound campaign on a mission mode envisioned to improve water availability



Bisalpur-Jaipur Water Supply Pipeline, Rajasthan



Damaged supply line in Bengaluru

including wastewater treatment and groundwater recharge. First time in the country, there have been a massive budget of over INR 6.5 lac crore granted towards the development of water supply schemes in rural and urban India. This is a mammoth task looking at the size and scope of the work involved under the JJM and it is going to bring a change in the social and economic scenario in rural hinterland with clean drinking water facilities available to all households in the country.

What are the major challenges being faced by India's water sector?

Water stress is the major challenge to combat with around 44% of the country's total population is facing high-to-extreme water scarcity and over 50% households do not have drinking water facilities on their premises. 21 major cities including metropolitans like Delhi, Bengaluru, Chennai and Hyderabad will run out of water that will affect another 100 million people.

Other significant challenges includes aging infrastructure of our water distribution network across cities, and with over 230 billion metre cubic groundwater drawn each year many parts of the country are experiencing rapid depletion of groundwater. The water pollution is another challenge as almost 70% of generated municipal wastewater is being discharged into water bodies without any form of treatment, making the surface and groundwater sources more contaminated leading to severe health risk. Among all these challenges, the high level of water loss in India takes precedence as almost 50% of produced water is lost in transition.

NRW is a big issue in India and water utilities in the country are not able to manage it. What is your view on it?

Water loss is a global issue facing by water utilities across continents. The only difference is, in India it is almost half of the total water produced. It is very alarming that with such a large population where our water consumption runs into trillions of litres of fresh water, we are losing almost 50% of it to non-revenue water (NRW). Global Water Intelligence has published a report over a year ago about their survey of NRW in world's top 40 water markets and the findings suggest that European countries are in a better position to manage their water losses than Asian and African nations.

The water loss was as low as 4% in Netherlands, 6% in Denmark and 7% in Japan leading the list with India placed at bottom with ominously high at 50% even behind the African nation, Algeria with 45%. Among better managed countries, Australia and Germany with 8% and Israel with 9% have managed to limit their water losses appropriately. The smaller nations having very limited resources like Kazakhstan and Czech Republic were able to manage their NRW levels under 20%. The aged pipeline networks and fragile water mains along with poor management of infrastructure are the leading cause of water loss across cities and towns in India.

Water supply networks are hidden below the surface where it can't be readily seen or easily measured. Most of the time, it is extremely difficult to pinpoint the cause of leaks and breaks and what percentage



of water loss is happening due to which causes and assign preventative measures. Repair efforts are usually only delegated to the most obvious sources of water loss, like significant water main breaks, etc.

How NRW is affecting the functioning of water utilities?

NRW is not only the water loss issue; it also affects the entire functioning of our water utilities. The leaks and breaks in the water supply network that allows water to escape are also dangerous to public health as it becomes the major source of contamination with impurities entering the distribution system impairing the quality of water. Almost 4 lac children prematurely die every year due to water borne diseases by drinking contaminated water.

The NRW percentage varies as per the location and age of water supply system in Indian cities. Even the small losses that accumulate over time can have significant financial impact on water utilities and it also has economic bearings on consumers as well. The water loss challenges can be real; physical losses (caused by leaks, breaks, spills, etc.) or only apparent losses that occur as a result of broken or tampered meters, faulty meter reading, inaccurate record keeping, or outright water theft results in unequal and unregulated distribution of water.

The water utilities in India are facing a daunting task to control the NRW levels in the absence of funds and technology. In economic terms, the loss of revenue is significant as huge cost are involved in producing drinkable water and when it is lost in transition, it became no value for the utilities struggling to arrange funds and resources to provide clean drinking water to increasing urban populations and expanding service areas. Reducing water losses is critical to efficient resource utilization, efficient utility management, better consumer satisfaction, and reduction

in capital-intensive capacity addition. The utility which has initiated and sustained water loss management programs has significantly gained financial returns and better consumer services.

Your company, SPML Infra Limited is involved with water supply for a long time. Tell us your experience with NRW management in India?

SPML Infra Limited is working in water sector in India for over four decades now and during this period; we have executed more than 650 projects across the nation. Today, I can say this with pride that we have been successful in our mission that we started in 1981 to make human life comfortable with our efforts. Today, SPML Infra is providing clean drinking water facilities to more than 50 million people in India everyday due to our executed projects in the states with high level of water scarcity.

In the NRW management, we have executed projects in Bengaluru for selected 43 DMAs in the city. With the help of innovative leak detection technology, we have been able to accurately identify and locate hidden leaks in large and small pipes and fixing them with sustainable methods. Working on such a project in extremely busy city like Bengaluru was very challenging due to very high volume of traffic with narrow streets and thickly populated areas. With professional approach and dedicated team of experts supported by advance leak detection equipment, we identified all the small and large leaks, breaks and dilapidated conditions of 50–60 year old pipelines, replaced them with new pipes, sustainably sealed all leakages and installed electronic district meters suitable for GSM/GPRS communication for measuring flow and pressure control to check any future leaks. The determined efforts to improve the condition has yielded good results in significantly reducing water loss from as high as



Mechanical joint in supply pipeline in Bengaluru NRW Project

over 72% in some DMA to an optimum level of ~ 10%. In the overall 43 DMAs, the reduction was significant from an average of 53% to bring it down to 21%. The efforts resulted in saving almost 48 million litres of clean drinking water every day that is being supplied to 110 extended colonies of Bengaluru.

Can technology be helpful in the management of NRW in India?

Non-revenue water is among the top issues facing by the water utilities. It is estimated that almost 8 trillion litres of drinking water leaks each year from out-dated systems in the United States alone. While in Britain, it is about 1.1 trillion litres and India is estimated of losing 3.4 trillion litres of clean water annually in distribution networks. In economic terms, World Bank has calculated that the cost of non-revenue water exceeds \$14 billion globally.

Water utilities across the globe are using smart sensors in their networks of pipes and junctions in an effort to detect leaks. These sensors use accelerometers, the same technology that detects movement on smartphones as it pick up vibrations that may be associated with a leak somewhere along the length of a pipe. A sensor with artificial intelligence (AI) system will refine on thousands of characteristic hum created by a leaky pipe to issue an alert with precise location. A sensor with AI system is very successful as it can pick up leaks with more than 90 percent accuracy.

Advanced metering infrastructure (AMI) system can be a fundamental component of any water conservation program managing supply network while detecting and stopping leaks by reading of water consumption on

an hourly basis in a network. The AMI will help with improvements in supply network and utilities can reduce NRW level in their service areas thus reaping economic benefits.

Other advance technology that helps in making water pipes smart is narrowband internet of things (NB-IoT) communications, a means of transmitting signals from thousands of remote sensors that uses just a small part of bandwidth to effectively detect leaks as pipe sensors sends far more frequent updates to a central control system for effective control and preventive maintenance.



Water Pipe Leaking