

REDUCING WATER LOSSES: AN URGENT CHALLENGE

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160 MLD Water Treatment Plant, Dhannaser, Rajasthan



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The entire landscape of drinking water scenario in India is changing rapidly. A country which was endowed with abundance of water not too far ago is facing an unprecedented crisis of drinkable water in almost all major cities across the country. The situation is getting further deteriorated as demand supply gap is rising and conflicts for water is becoming more frequent.

Last year India's policy thinkers at Niti Aayog have published a report to highlight the precarious situation about the water supply scenario in India which was not well known to policy makers. The report namely 'Composite Water Management Index' suggest that India is currently suffering from the worst water crisis in its history and the country is ranked at 120th position amongst the 122 countries surveyed for quality of water in WaterAid's water quality index. It has also identified that 600 million people which is around 44% of the country's total population is facing high-to-extreme water stress and 75% of households do not have drinking water facilities on their premises. It also suggest that about 100 million people will be affected by shortage of groundwater and 21 major cities of India including metropolitan cities like Delhi, Bengaluru, Chennai and Hyderabad will run out of water and face 'day zero' which means literally switching off the water supply of the city for a day. This term got popular after a major water crisis in Cape Town that forced the authorities to switch off the water supply of



Damaged supply line in Bengaluru

the entire city due to non-availability of water. The predictions that about 40% of India's population will have no access to drinking water by 2030 is really alarming and requires an immediate action plan to mitigate the crisis.

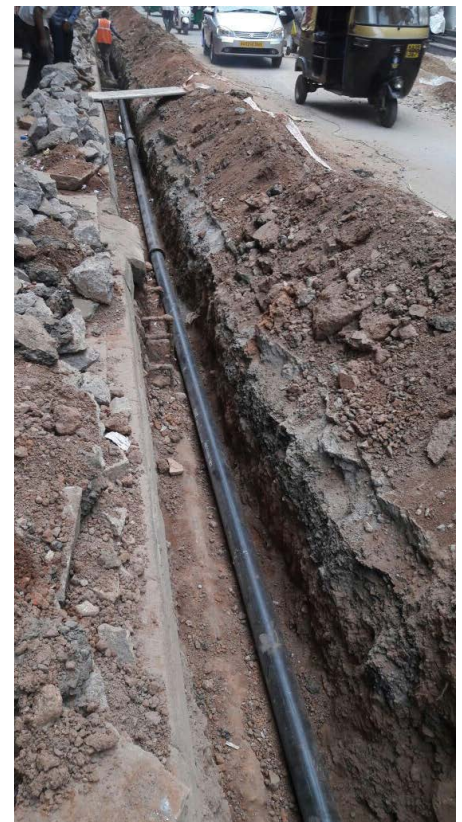
Water Infrastructure

With the impending crisis and difficulty in finding new source, water has become everybody's business. As human needs water to survive, similarly business needs water to thrive. And the reality is, we are getting closer to 'no water' scenario if we continue to use it in the same manner we have been using it.

With the world's second largest population at 1386.12 million currently and increasing at a rate faster than other countries; India is adding population equals to a small country every year to its tally and expected to become the most populous country by 2024 and continue growing to cross 1700 million by the year 2050. With almost 18% of the world's population living in the country, India has just a fraction about 4% of world's fresh water sources. Imagine the fresh water crisis that out of the very limited water availability, almost 80% of our surface water and over 60% of ground water reserves are contaminated.

The water future in India seems to be turbulent and distressed and water infrastructure development is not synchronised with the crisis. Most water distribution networks in Indian cities

are in dilapidated state due to being too old having been developed decades ago. At some places it is pre-independence development which is still running with hiccups. We need to think swiftly to develop robust and sustainable



DI pipe laying



Gagreen Water Supply Scheme, Rajasthan

water infrastructure complete with technological innovations to manage future of water in India in more sustainable manner. Drastic steps are required to professionally maintain all water infrastructure in the country with the view of long term demand and supply management and effective control on water losses.

Water Loss: Biggest Challenge

Water loss is a global problem across continents and the percentage varies from developed to poor nations in terms of lost quantity. Recently, Global Water Intelligence (GWI) has carried out a survey amongst the world's top 40 water markets and published the findings in November 2020 suggesting that European countries are in a better position to manage their losses than Asian and African countries. The water loss percentage is as low as 4% in Netherlands and 6% in Denmark. Among Asian countries, Japan has the best figure of managing their water losses at 7% whereas India is lagging behind other countries with shockingly 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. Even the smaller nations like Kazakhstan and Czech Republic with limited resources have managed it in a much better way under 20% than the large countries like Brazil at 38% and Italy and Jordan with 41% and 47% respectively.

It is disheartening to learn that India with water losses at half of the supplies is placed at the bottom of the water loss pyramid in the surveyed top water markets. The deteriorating water infrastructure and huge costs associated with repair and replacement are among the top concerns for water utilities. The aged pipeline networks and fragile water mains are the leading causes of water loss across cities and towns in India.

Water loss is a critical issue for India as it is facing widespread droughts and acute water scarcity combined with impacts from climate change and rapidly increasing rates of urbanization as cities across the country exploding in size and number. The water distribution loss in the capital city of

Delhi was reported to be about 40%. In other large cities the ratio is almost similar or may be higher than Delhi leave alone the smaller cities where it goes up to anywhere between 60% to 70%. These numbers varies as per the location and age of water supply system among the Indian towns and 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 leaks and breaks that allow water to escape can also be dangerous as it becomes the major source of contamination with impurities entering the distribution system impairing the quality of the water. In India, almost 4 lac children die every year due to diarrhoea and other water borne diseases primarily due to drinking contaminated water. World Health Organisation (WHO) reports

that globally at least 2 billion people use faeces-contaminated drinking water source thus becoming susceptible to a range of diseases such as diarrhoea, cholera, dysentery, typhoid, and polio.

Being buried underground, water supply pipes are not normally noticed unless they fail or break. The very nature of water loss makes it difficult to find or determine the specific locations and causes of the loss. Water supply networks are essentially 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 break downs 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. The water consumers take pipeline network for granted not knowing how much engineering, maintenance, and repair work is required to keep them operating properly to provide their daily water needs.

Water Loss Reduction by SPML Infra

SPML Infra Limited is executing a water loss management project initiated by the Bangalore Water Supply and Sewerage Board for the select areas in Bengaluru. By using 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. In such a large and utmost

busy city like Bengaluru, executing a water loss management project in central part of the city was extremely challenging due to very high volume of traffic and main business zones combined with narrow streets of thickly populated areas.

The project works also been executed in areas with maximum number of slums posing as a tough challenge to bring down the water loss from the existing level to the present level. The project has 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. All these determined efforts to improve the situation has helped in significantly reducing water losses from 56% to 24%, thus saving over 45 million litres' of potable water per day. The saved water is being used to provide drinking water facilities to more than 110 extended colonies of Bengaluru.

Way Forward

The water losses are primarily the result of aged infrastructure in our country. Many of our cities still use water infrastructure that was built in the pre-independence era. Despite the imminent water scarcity and higher levels of water losses, when it comes to estimating the losses, very few water utilities in the country perform water audits that meet the standard. The hopeful observation is that a large percentage of this loss is potentially recoverable given the will and means applied for it.

The Ministry of Jal Shakti is advocating a policy framework for benchmarking water consumption by industries. The same framework is also needed for the municipal water supplies in the country with concentrated efforts towards reducing the water losses to an optimum level within a fixed time frame. The water professionals across the globe are of the view that deteriorating water infrastructure are their top concern and it could be tackled with technological advances and required funding.

We all need to think together to save the declining water sources and reduce the losses in distribution network followed by the installation of proper metering and measuring of consumption across the cities to be able to face the growing challenges of sinking availability and increasing demands.

About the Author

Mr. Subhash Sethi is Chairman of SPML Infra Limited. An ISO 9001:2015 Company nurtured by him has become the leading infrastructure development company in India with over 600 completed projects in a rich legacy of four decades. He has been bestowed with a number of awards for his significant contributions towards the development of water and power sector in India.

To know more about the contributor of this case study, you can write to us. Your feedback is welcome and should be sent at: deepak.chaudhary@eawater.com.