

# CHALLENGES IN INDIA'S WATER

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We do not really understand water. The two-third cover of our planet is still a mystery. The deeper we look into it, the secret deepens. Water defines the life on earth. It is central to atmospheric sciences, ecology to biology and many technological innovations.

Whether it's a growing population, rapid urbanization, a changing climate pattern or increasing expectations from people and businesses, water is at the heart of every situation. Every cell, tissue and organ in our body needs water to work properly. Water gets rid of wastes from our body, it keeps body temperature normal, and water also lubricates and cushions our joints. Water is also critical for your heart health. Our heart is constantly working, pumping about 2,000 gallons of blood a day. We help our heart to do its job by staying hydrated - by drinking water at regular intervals.

Water is essential for survival. Even as people struggle to find the water they need for drinking, cooking, washing and farming, many more faces the fury as climate extremes batter their homes with storms and floods. Climate change is perhaps the greatest threat facing the global water system, simply because in reality it is composed of many different threats. As greenhouse gas emissions cause the planet to increase in temperature, the world's hottest regions are becoming even hotter and the water sources are drying up leading to water scarcity. Nobody has imagined that Delhi will face a plus 49 degree temperature in summer, but the unthinkable is happening.

India is currently facing a historical water stress with more than 40% of its population facing extreme water scarcity and some of the major cities in the country have reached to zero groundwater situation. The situation is further threatening with World Bank estimating that by 2030 India's water demand will outstrip

The crisis of our diminishing water resources is just as severe as any wartime crisis.

supply by almost 50%, a significant challenge to arrange water for domestic and commercial purposes.

India constitutes about 18% of the world's population, but the country has only 4% of world's freshwater resources. With the changing weather patterns and recurring droughts, India has become a water stressed nation. As many as 256 out of 770 districts have reported 'critical' or 'over-exploited' groundwater levels.

This means that fetching water in these districts has become harder as the water table has fallen sharply.

## Groundwater Depletion

Around a third of the planet's fresh water comes from underground aquifers, and while these are not visible, they are vital to maintaining our agriculture and industry. Unless urgent action is taken, 60% of India's aquifers will be running perilously low on water within next 18 years. Not only water is scarce in India, but the extraction of groundwater has been on the rise for decades. India is also the largest user of groundwater in the world. It uses an estimated 230 cubic kilometers of groundwater per year - over 25% of the world's total. More than 60% of irrigated agriculture and 85% of drinking water supplies are dependent on groundwater.

Since 1960s, government's support for the "green revolution" to ensure food security has increased the demand for groundwater for agriculture. The rural electrification drive combined with the availability of modern pump technologies has led to an increase in the number of bore wells to meet the demand. The number of bore wells has grown in the country from 1 million to 33 million in past over five decades, making India the world's largest user of groundwater.

The Central Groundwater Board of India estimates that about 17% of groundwater blocks are overexploited (meaning the rate at which water is extracted exceeds the rate at which the aquifer is able to recharge) while 5%

are at critical and 14% at semi-critical stages. The situation is particularly alarming in three major regions – north-western, western, and southern peninsula.

Groundwater quality is very important because the consequences of contaminated groundwater for human health, agriculture, and the economy are critical. The chemical and microbiological quality of groundwater is central to its utility, yet the resource remains vulnerable to contamination from both natural processes and human activities.

### Water Pollution

Tackling water pollution is an enormous challenge, as it encompasses everything from sewage entering into drinking water supply to the endless plastic waste pouring into river systems around the world. According to the United Nations, around 80% of generated wastewater containing anything from the human waste to industrial discharges goes untreated.

Water Aid, working on water, sanitation and hygiene finds that an alarming 80% of India's surface water is polluted. Central Pollution Control Board estimates that 75-80 per cent of water pollution by volume is from domestic sewage, while untreated sewage flowing into water bodies including rivers have almost doubled in recent years.

The urban India is currently generating nearly 73,000 MLD of sewage per day which is expected to increase to over 87,000-97,000 MLD by 2025. Presently, there are only 28%

of generated sewage is being actually treated leaving a big gap of 72% not receiving any form of treatment and released into water bodies. While the industrial water demand is increasing, there is still a big gap in the treatment of industrial effluents.

Wastewater treatment has become essential to not only address the shortage of fresh water but also saving the surface and ground water sources from further contamination. SPML Infra Limited has been promoting sustainable integrated water management systems and 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 the capabilities to provide reuse with recovery of resources from waste as well as solutions for proper treatment and disposal of wastewater with specific processes such as anaerobic, anoxic, and aerobic. SPML Infra has executed numerous wastewater treatment plants across the country which is fully equipped with modern technology and automation system for reliable and efficient operation and maintenance.

### Poor Infrastructure

The most obvious issue with water supply is poor condition and failings of infrastructure, among the biggest barriers to keeping water safe and supplied. Water must be transported around in vast networks of pipes and dealt with at treatment plants, and these take a lot of

maintenance and investment. While there are many problems contributing to this situation, the impending one is that the country is losing around 3.4 trillion litres of water each year to old and leaking pipes. The average household leaks can account for nearly 45,500 litres of water wasted every year and 10% of homes have leaks that waste 1, 46,000 litres or more in a year. The World Bank has calculated that

We have seen water availability change drastically in India from abundance to almost half of the population living in a true water crisis.

the cost of non-revenue water due to frequent leaks along with standard theft and billing errors exceeds \$14 billion globally and increasing.

The water needs to be transported, treated, and discharged. India is facing a huge challenge of dismal state of its water infrastructure - treatment plants, pipe networks, and sewer systems in a state of disrepair. While almost 50% of supplied water is lost in India as non-revenue water due to leaky pipes and poor control, the water utilities tend to ignore growing infrastructure issues until disaster strikes.

A classic example of attending the water loss issue is in Bangalore. The city water utility, Bangalore Water Supply and Sewerage Board has implemented a water loss management project and saved about 170 MLD of treated water in the project areas. SPML Infra has executed a part of this project in 43 DMAs having around a million populations, where it has replaced 50-60 year old pipes and innovative leak detection technology were used to accurately identify and locate hidden leaks in large and small pipes and fixed them with sustainable methods with GSM/GPRS communication system for measuring flow and pressure control. The determined effort to improve the situation helped in significantly reducing water losses from as high as 72.56% in some area to reduce it to 10.24% with average of all DMAs reduction from 53% to 21%, saving almost 50 million litres' of potable water per day. Saved water is being used to provide drinking water facilities to over 110 newly developed settlements of Bengaluru.

### Inaccurate Pricing

Water is seriously undervalued in India due



68 MLD Water Treatment Plant, Hubli-Dharwad, Karnataka

to political and various other reasons. Its price does not reflect the true, total cost of service, from its transport via infrastructure to its treatment and disposal. This has led to mismanagement and wastage of water and a lack of funds with utilities to invest in infrastructure development and repair. It also affects the adoption and implementation of new water technologies that manage water more efficiently. The pressing question is why a water utility or government would invest in expensive water-saving technologies, when water is cheaper than the technology itself. When the price of receiving clean water is closer to its actual service cost, efficient water use will be encouraged. The flip side is the poor often end up paying disproportionately high prices for water, due to water mafia controlling the distribution by transporting it.

### Bright Spot

Amidst all these water inequalities, there is good news: governments, businesses, institutions and citizens are waking up to water challenges, and beginning to take action. Each year brings more solutions – like using wastewater for potable and non-potable purposes, catching the rain, using restoration to bring water back to dry topographies, monitoring groundwater levels more closely, and developing and adopting new technological solutions to manage water storage to distribution network as well as making focused approach to curb water losses. Even the best solutions will not implement themselves; political will and public participation is critical in ensuring a sustainable water future.

#### About the Author

**Mr. Subhash Sethi** is leading SPML Infra Limited with a mission driven approach to get clean drinking water to people. His dedicated efforts have made the company execute over 650 projects and provide drinking water to more than 50 million people. His contributions have been well recognized with several national and international awards.

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](mailto:deepak.chaudhary@eawater.com)



2587 MLD Pumping House for SAUNI Yojana Phase-1, Gujarat



Aerial View of Pokhran Water Supply Project



Water Supply Pipeline, Pali, Rajasthan