

# WATER – THE NEW OIL OF FUTURE

By Subhash Sethi



119 MLD Water Treatment Plant, Pokhran, Rajasthan

Water is essential for life, but the world is facing increasing challenges in securing sufficient clean water to support the livelihood on the planet.

India like other developing countries is facing rapid urbanization and high population growth due to which demand for water is increasing manifold year after year. The demand supply gap is becoming wider and water conflict from small at colony level to bigger between states and nations are getting common now. The insufficient clean water for distribution and water scarcity are affliction that is spreading very fast, concerns are also on the rise. For decades, we have invested heavily in fossil fuels – coal, oil, gas, and their derivative chemicals and plastic with little or no

concern for consequences that today are evident in the form of pollution in water – we cannot drink, air – we cannot breathe, toxic environment around us and our failure to manage by-products and waste. In earlier days, we responded through a number of regulations, laws, and international treaties for water and made some progress in limiting and mitigating the consequences. Those restrictions, even the alternative strategies to replenish and recycle the resources are weakening and we are again returning to old values, policies, and behaviors which were considered obsolete and not relevant. [www.spml.co.in](http://www.spml.co.in)

### Future of Water

India is home to about 17 percent of the world's



INDIA WILL HAVE ONLY 22 PERCENT OF THE PRESENT DAILY PER CAPITA WATER AVAILABLE BY THE YEAR 2050, WHICH MAY POSSIBLY FORCING US TO IMPORT WATER. THE SCENARIO SUGGESTS THAT WATER WILL BECOME THE NEW OIL OF FUTURE.

population, has only 2.5 percent of the world's land area and just 4 percent of the world's water resources. It is estimated that India gets about 4,000 trillion liters of fresh water through rain and snow falls, but most of it flows back to seas and oceans by many rivers we have in our country. A much smaller percentage of this water is absorbed by the soil and is stored in aquifers along with recharging of natural water bodies like lakes and ponds and created water bodies like underground and ground reservoirs. The demand for water has been increasing faster than ever in the past few years compared to earlier demands. The current estimated consumption is approximately 581 trillion liters with irrigation consumption at a staggering approximately 88 percent followed by domestic use at 8 percent and industrial use at 4 percent.

A recent study released for the week ending January 25, 2018 suggest that water storage level of 91 major reservoirs of the country has gone down by further 2 percent. The availability is 73.03 trillion liters which are just 45 percent of total storage capacity of these reservoirs, from 47 percent for the week ending on January 18, 2018. This is alarming as the rain deficit for the month of January is over 80 percent. In India, out of 1869 trillion liters of water reserves, only an estimated 1122 trillion liters can be used due to geographical distribution and topographic constraints.

By 2050, India's total population will reach at staggering 1.7 billion and water demand will increase by over 32 percent from the current demand. Domestic and industrial sectors will account for 85 percent of the additional demand. The continuous over-exploitation of groundwater, failure to recharge aquifers and surface water bodies, reduction in catchment capacities due to uncontrolled development and rapid urbanization

In order to truly understand and mitigate the issues of our natural resource—water, there should be planned and effective response to decades of uncontrolled extraction, transformation, and pollution in the name of consumption.



11 MLD Decentralized Sewage Treatment Plant at Mira Bhayander

are causes of grave concern as far as our water future is concern. If the present rate of groundwater depletion continues, India will have only 22 percent of the present daily per capita water available by the year 2050, which may possibly forcing us to import water. The scenario suggests that water will become the new oil of future.

### Key Issues

The present water situation in the country has many components from an environmental, economic and social perspective to overuse of water, rampant pollution, ever reducing availability and mismanagement.

### Increasing Water Demand

Water demand in the country is projected to very soon overtake the availability. It has already started happening in some regions of the country. With the current trends in industrial and urban growth followed by population increase has led to a significant increase in water demands which is expected to further increase by 20 percent in the next decade, fueled primarily by the industrial requirements which are projected to double from 23.2 trillion liters at present to 47 trillion liters. The domestic demand is expected to grow by around 40 percent from 41 to 55 trillion liters while irrigation is estimated to require only about 14 percent more in ten years from 517 trillion liters to 592 trillion liters.

### Reducing Water Availability

The depleting water levels in the country and drying up of aquifers are major concern in regard

to per capita availability of water which has significantly reduced over the years and is likely to reduce further with the growing population and increasing demand. Ministry of Water Resources has estimated that per capita water availability will be reduced by almost 36 percent by 2025 and alarmingly 60 percent by 2050 from that of 2001 levels. Central Ground Water Authority has surveyed 5723 blocks across the country and found that 839 blocks are over-exploited, 226 blocks have become critical, while 550 blocks are under the semi-critical condition. The overall about 29 percent of India's ground water blocks are considered to be in stressed stage and needed very careful extraction and judicious use.

### Regional Disparities

The availability of water in India is not equal in all regions and disparity is evident across the country due to uneven rainfall. Most part of the country including our large cities like Mumbai and Chennai depends on rainfall for their water supplies. The demand supply gap is evident in Chennai where the available water from water sources such as lakes and reservoirs are below 40 percent of the city's daily requirements. India's north-western region widely considered to be the country's granary, with states such as Punjab and Haryana accounting for a large share of the country's agricultural output. But farming in both these state is increasingly becoming unsustainable, owing to depleting groundwater levels and erratic rainfall conditions. The situation is equally precarious in the south-eastern parts of the country. Both these regions account for most of India's groundwater-stressed blocks.





200 MLD WTP, Surajpura

### Inefficiencies in Usage

Agriculture sector which consumes a major part of available water has inefficient usage pattern. An earlier report cited that the irrigation efficiency in India was at 36 percent in the nineties and projected to increase to around 60 percent by 2050 to bring a balance in the demand and supply. The International Water Management Institute (IWMI) report suggests that 50 percent increase in demand of water by 2025 can be met by increasing the effectiveness of irrigation only. Domestic and industrial usage of water is also inefficient and one of the key reasons for this is the lack of economic pricing of water. Due to several reasons, consecutive governments have largely refrained from pricing water at its real cost. The subsidized cost of water has encouraged overuse and wastage.

### Unaccounted—for Water (UFW)

Unaccounted—for water (UFW) or non-revenue-water (NRW) is quite high in Indian cities due to several reasons including old water infrastructure, poor maintenance, illegal connections, leakage, and lack of proper mapping of distribution system. In many cities, the unaccounted water is more than 60 percent. Even the pumping system is not efficient and loses good amount of water during pumping. If water utilities can improve the pumping efficiency by even 25 percent, it will help increasing water supply to more areas from within the available water. SPML Infra is executing the UFW project in Bengaluru, where the company has used innovative technology of helium leak detection to accurately identify and locate hidden leaks in large and small pipes. The NRW level was 61 percent at the beginning of the

project in 2013 which has reduced significantly to 33 percent which resulted in saving 16.5 MLD of drinking water. The project has progressed in the city where 50–60 year old pipes are replaced with new ones, leakage has been sealed and electronic district meters suitable for GSM/GPRS communication for measuring flow and pressure control are installed.

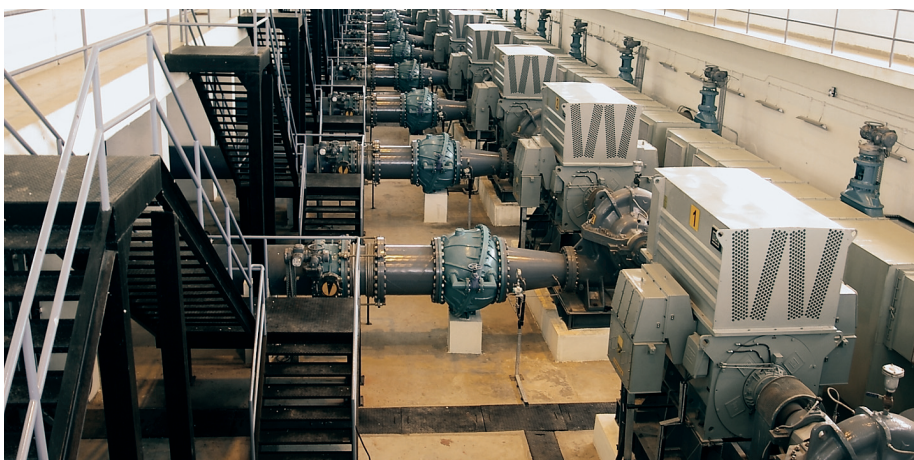
### Pollution and Contamination

Water pollution is a big issue in India as almost 80 percent of our surface water resources are contaminated. Nearly 60 percent of India's ground water reserves are already contaminated with biological, organic, and inorganic pollutants. These contaminated sources have been declared unsafe for human consumption as well as for other activities, like, agriculture and industrial usage. The Central Pollution Control Board (CPCB) has listed 18 major rivers in India as unfit for any domestic and industrial water usage. The water sources are mainly contaminated in and around of Indian cities, towns and other urban settlements. Heavy metals and geo-genic contamination including salinity, iron, fluoride and arsenic have affected groundwater reserves in over 240 districts. Groundwater contamination with chemicals is another big health hazard.

Vast tracts of India are contaminated with fluoride and arsenic. Fluoride problem exists in over 200 districts spread across 20 states with Odisha and Rajasthan being critically hit with this problem.

### Investment Requirement for Infrastructure Development

The growing demand for water from urban population requires big investment in urban water supply and sanitation. Although the investment has increased during the last few years in terms of central government grants made available under AMRUT scheme, Clean Ganga Mission, Water Supply and Irrigation Funds and earlier under JNNURM etc. International funding agencies like World Bank, Asian Development Bank (ADB), Japan International Cooperation Agency (JICA) have also funded a number of water supply projects in several states. SPML Infra is executing 24x7 urban water supply projects in six cities of Karnataka which has been funded by ADB to improve urban services in towns and cities.



500 MLD Water Pumping Station, Bangalore

The finance minister in his budget speech has estimated that India needs INR 50 lakh crore investments in infrastructure development. Currently India spends about 5.5 percent of its GDP on infrastructure, less than several countries in Asia, and half of the 11 percent invested by China. While private sector interest has increased, critical barriers such as poorly structured contracts with inappropriate risk allocation, irrational bidding and large timelines to project award, inordinate delays in land and environment clearance, and over-reliance on bank-led financing etc. have further strained the sector.

### Water Economy

Water has two aspects – as a basic human need, and as economic resource with its cost and value. In the past over two decades, India's economy has improved, people's expenditure patterns and their lifestyles have changed, progress is visible in all segments of life, all these along with rapid urbanization have added fuel to these changes. The living standards have improved and food consumption patterns have changed in a way that was never imagined a few decades ago. The changing food consumption patterns are so significant that they have a considerable impact on future food and water demands. The World Health Organization recommends that, at the very least, a single person needs access to 50 liters of clean water per day for basic hygiene and hydration. Imagine the cost of producing 50 liters of clean drinking water where costs involved in transportation from source to treatment plant, cost of chemical for treatment, energy used to treat, pump, supply to households and the disposal cost of generated wastewater in the same manner.

In India, the nominal cost of water being supplied to people means that it is not a commodity and a lot of investments aimed at conserving it do not seem to offer satisfactory returns. The typical scenario in many cities suggests that very few households actually pay for water. It is high time, we must take a broader view of water: as a "commodity" with production inputs and outputs to which a variety of costs and recoverable values can be assigned. The water tariffs, charges to dispose of wastewater, its treatment, pumping and discharge must be considered as per its economic cost that can only help in optimizing its use and can yield

significant financial returns.

### Way Forward

There is a need to consider adopting a more integrated approach to water supply and wastewater management in the country with reliability and financial sustainability. Improved cost recovery by adopting systematic approach to review user charges towards water supply and sanitation services will be essential.

It is important that the following steps are taken by various stakeholders to improve the situation:

- ▶▶ Modify the National Water Policy to emphasize re-use of treated wastewater and reduction in groundwater usage. This is especially relevant for sectors like agriculture and industrial that together consume over 90 percent of fresh water
- ▶▶ Expand funding for water source development, sewerage networks and sewage treatment plants under dedicated schemes and budgetary allocations
- ▶▶ Increase technical and financial assistance to water utilities and municipal corporations to award and manage public private partnership (PPP) projects for both water supply and wastewater treatment and reuse projects
- ▶▶ Increase support and technical assistance to water utilities and municipal corporations for taking up projects for loss reduction, improvement in non-revenue-water and groundwater recharge projects. A watershed approach, integrating research, monitoring, data base, implementation and management will also help.
- ▶▶ Create a national regulatory framework and institution to oversee the management of water resources, state and project disputes and pricing of water on pan India basis
- ▶▶ Upgrade planning capacity in water utilities and municipalities by increasing or engaging town planners, sanitation experts and environmental engineers to develop plans for sustainable water supply management and expanding sewage collection and treatment networks
- ▶▶ Create awareness among farmers to adopt water-use efficiency such as drip irrigation
- ▶▶ Improve water governance system based on

participation of stakeholders and the public and private sector

- ▶▶ Economic evaluation of water resources surface and underground, lakes, rivers and reservoirs with remedial actions for continuous improvement
- ▶▶ Capacity building programs at all levels with clear objectives and regular monitoring with an integrated approach for predictive and preventive maintenance of aquifers, underground resources and water and wastewater infrastructures across the country etc.

The world has begun to recognize water as a resource. Water sustainability requires action by both government and public equally, with the government playing a decisive role in addressing the challenges.

### About the Author

**Subhash Sethi** is Chairman of SPML Infra Limited. Over the last three decades, he worked relentlessly to grow the company with his mission to create value for the country. Under his able guidance and leadership, SPML Infra has become the leading infrastructure development company in India with a legacy of over 600 completed projects. Today, SPML Infra is providing drinking water facilities to over 40 million people and it has become the only Indian company to be featured among World's Top 40 Private Water Companies according to research by Global Water Intelligence, London. With sheer commitment and ethical business practices, he continued walking the road of discovery and innovation.

**SPML Infra Limited** has integrated its strength in basic and in-depth engineering, process technology, project management, procurement, fabrication & erection, construction and commissioning to offer distinct responsibility under strict delivery agendas. Many of the engineering and construction projects executed by SPML have set new benchmarks in terms of scale, sophistication and speed. SPML has in-house engineering capabilities for both project design and construction. SPML design and engineering encompasses IT enabled facilities including modern CAD centre using various design and project management software.

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