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WASTEWATER: THE FORGOTTEN RESOURCE

By Subhash Sethi, Chairman, SPML Infra Limited



11 MLD Decentralised Sewage Treatment Plant at Mira Bhayander



WHO report says
that 6 out of 10
people lack access
to safely managed
sanitation facilities
in the world.



35 MLD CETP at Bawana, Delhi

Water is vital for the existence of life. But this valued resource is diminishing faster than expected and increasingly being threatened as human populations are growing exponentially and demand more water for domestic purposes and economic activities. Among the various environmental challenges the world is facing, fresh water scarcity is topping the chart. According to the World Health Organization, in 2020, 3 out of 10 people in the world lack access to safely managed drinking water services, and 6 out of 10 people lack access to safely managed sanitation facilities. The situation is about the same in all developing countries including India.

With the world's second largest population, India is suffering with severe water crisis as currently around 600 million Indians are facing high to extreme water stress and about two lac people die every year due to inadequate access to safe water. With the population growth, heightened industrial and agriculture activities, the water crisis is getting worse with the passage of time. By the year 2030, the country's water demand is projected to increase twice the availability thus increasing the severity of water shortage that will force millions of people to live without adequate drinking water supply and an eventual ~

6 per cent loss in the country's GDP. The National Commission for Integrated Water Resource Development has red flagged the emerging situation as the current availability of water is lower than the demand which is increasing at unsustainable rate due to increasing population, declining water sources and aging infrastructure. In such a frightening situation, the imminent need is to properly understand the availability and usage of our resources with efficient and sustainable practices.

Wastewater Accumulation

India is grappling with the huge challenge of shrinking water resources and increasing water demand. Currently, about 94 per cent of the population has access to drinking water and just about 40 per cent has access to wastewater management systems. More than 60 per cent of municipal wastewater and 40 per cent of industrial wastewater is left untreated and discharged into water bodies. This wide disparity emphasizes the need for development of wastewater treatment systems. Untreated water also has dire consequences on health as globally water borne diseases affect almost 40 million people every year. The urban population in India has jumped from 80.7 million in 1960 to 471.03

million in 2019, a huge jump of six times in past six decades. This has thrown up two serious problems; shortage of water and sewage overload.

India that used to produce 62 billion litres of wastewater per day in 2015 has increased the load to 71 billion litres per day in 2019 and it is continuously growing. The treatment capacity too increased from 23 billion litres to 28 billion litres a day during this period, which is still far short of the global standard. The treatment facilities existing are a mere 40 per cent of the actual generation. The large gap between generation and treatment of wastewater in India is further intensified due to existing treatment plants' capacity is not effectively utilized. It is estimated that about 80 per cent of total water supplied for domestic use gets generated as wastewater and released into

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42 MLD Sewage Treatment Plant, Kanpur

fresh water sources, thus polluting it further. The future trends suggest that India is projected to generate 120 billion litres of wastewater from urban population and another 50 billion litres from the rural population by the year 2050. The Supreme Court of India and National Green Tribunal has issued instructions and guidelines related to municipal and industrial wastewater for treatment and benchmarking which needs to be followed properly. It is estimated that by 2050, more than 50 per cent of the country's population will live in cities and towns and thus the demand for wastewater treatment infrastructure facilities is expected to rise sharply.

Wastewater as Resource

In this age of drinking water scarcity, impact of climate change, repeated drought and other environmental factors, the line between water and wastewater is getting blurred. Sewage generation is increasing rapidly in India, and

in the absence of adequate infrastructure for collection and treatment, the already depleting freshwater reserves are being polluted. One of the most important strategies revolves around the water scarcity is treating the maximum quantity of generated wastewater and making it reusable as non-potable water. The treated water becomes a valuable resource that can be utilized for agriculture, gardening, power generation and industrial purposes, effectively for all purposes other than drinking water.

There are immense opportunities revolves around the treated water usage. In areas that suffer from frequent water shortages, having the ability to reuse wastewater offers extraordinary environmental and industrial benefits, not to mention the financial benefits to cities that are able to sell their wastewater. The suitable infrastructure solutions in terms of pumps systems and treatment facilities is needed to create to handle the volume of wastewater produced by the city.

Global Best Practices

Wastewater is a renewable resource which also has the potential to generate trillions of unit of energy each year. The sludge from sewage can be used to produce chemical free manure

for horticulture or even as an alternative fuel. Globally, not only the developed nations but even the smaller countries are using recycled water for agriculture, industrial and even for drinking purposes. Singapore is using all its wastewater to treat and turn it into drinking water. The Australian city Perth is recycling about a good amount of the city's 134 billion litres wastewater into drinking supplies. Israel is using nearly 90 per cent of the country's wastewater for irrigation and other purposes. Florida state is at the forefront of US wastewater reuse adoption and almost two third of generated wastewater is being reused for different purposes. The city of Orlando has created a 1640 acre wetlands system using reclaimed water from the wastewater treatment facility. In Durban about 98 per cent of the wastewater is recycled and reused by local industries in their production processes. Beijing is using recycled water in infrastructure development to keep up with an ever-expanding mega city. Bangkok is treating wastewater as a resource and a valuable economic good. Kampala, Uganda is protecting its water source with an integrated plan to control, treat and reuse wastewater. Manila is regenerating resources through wastewater treatment and reuse.

A conservative data from the United Nations Water Report suggest that at least 50 countries worldwide are known to use wastewater for agricultural irrigation purposes, accounting for an estimated 10 per cent of all irrigated land. The report has clearly highlighted that once treated; wastewater could prove invaluable resource in meeting the growing demand for freshwater and other raw materials. It is very important that this valuable resource is recognised in a world where water is finite and demand is growing.

We have a good example in Chennai where the utility body has established water recycling through strong coordination and good governance. Chennai is the first metro city in India that has implemented 100 per cent sewage collection and formulated service standards for accelerated wastewater reuse and the "Zero Water Discharge in Chennai" program. All Indian cities must follow the Chennai example by establishing ambitious target and introducing policies to support 'zero discharge' concepts. Partnering with industry,

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98% wastewater is treated
and used by the industries in
Durban.
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such as in Durban, where 98 per cent of wastewater is treated and used by industry, can have a financial impact on reducing operational costs and also helps in addressing water scarcity, public health and socio-economic development.

New Initiatives

In the last few years, the wastewater segment has witnessed some important trends and developments. Amongst the important development is the emerging trend of setting up decentralized sewage treatment facilities which has already been tried and tested earlier in Mira Bhayander, the satellite city of Mumbai. SPML Infra Limited has executed this project which is designed completely as decentralized system having separate collection and treatment facilities in 10 zones across the city. This is one of India's largest and first comprehensive underground sewerage system with 113 kilometers of sewer lines, 10 pumping stations, 10 sewage treatment plants of various capacities ranging from 7 MLD to 17 MLD with total capacity of 115 MLD having advanced MBBR treatment technology with high level of treatment efficiency. Other initiatives include recycling and reuse of wastewater for industries and irrigation purposes and also the wastewater-to-energy plants is gaining acceptance. Advanced treatment technologies are being adopted for sewage treatment that produces better quality recycled water with better energy efficiency.

There is an increasing focus on adding treatment capacity and improving efficiency. Municipalities and Urban local bodies in several cities have started adopting modern treatment technologies and automation of sewage treatment plants along with online services to improve their operation and management. The government has also introduced a number of programmes and schemes to strengthen the country's sewerage infrastructure. The National Mission for Clean Ganga, Smart Cities Mission, Swacch Bharat Abhiyan and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) were launched to scale up infrastructure capacities for wastewater treatment and reuse. Different models of project partnership are being adopted by the ULBs while they are taking steps to achieve financial independence. A number of public-private



70 MLD STP,Nasik, Maharashtra

partnership (PPP) and long-term operations and maintenance contracts are being introduced to encourage private sector participation. This has already resulted in improvements in operational performance and sewage management in Nagpur, Delhi, Surat, Chennai and Bengaluru.

The digital technology, satellite surveillance, supervisory control, data acquisition systems, remote sensors and geographic information systems etc. is being deployed across the country for monitoring of collection and treatment with minimum human interference. The water and wastewater sector in India is growing with noticeable improvements in operational parameters and coverage in the country, though a lot of work still remains to be done. Capacities are still inadequate to meet the current demand which needs to be expedited with spirited efforts and availability of required financial support to the urban local bodies.

SPML Infra Contribution

SPML Infra Limited has been advocating for treatment and reuse of all generated wastewater in all cities of India and has contributed immensely with the construction and management of sewage and effluent treatment plants. It has constructed more than 1000 MLD of sewage and effluent treatment plants in different cities. Among the signature sewage treatment plants constructed and maintained by SPML Infra includes the 130

kilometre sewerage network and 42 MLD sewage treatment plant in Kanpur with facility of bio-gas generation. Kanpur Sewerage System is strategically planned and executed to treat the sewage and effluent of the current population of more than 3 million people and numerous industries with inbuilt capacity to handle the future demands for next 30 years. This project has contributed considerably towards the mission of clean Ganga. The 240 MLD sewage treatment plant in Ahmedabad is constructed to provide treatment and safe disposal system for wastewater produced by the city. Other treatment plants like 72 MLD sewage treatment plant in Delhi, 70 MLD sewage treatment plant in Nasik, and 115 MLD decentralized sewage treatment in Mira Bhayander, Maharashtra are among the many such examples.

About the Author

Mr. Subhash Sethi is Chairman of SPML Infra Limited. Under his leadership, SPML Infra went on to establish itself as the leader in water domain and developed sustainable infrastructure to deliver safe and clean drinking water to over 50 million people in India. He has been bestowed with several prestigious awards including Economic Times Global Asian Business Leader for his valuable contributions.

To know more about the author and contributor, you can write to us. Your feedback is welcome and should be sent at: content@eawater.com.