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HOW CAN INDIA OVERCOME WATER STRESS?

The country needs a fresh perspective by looking at new ideas and adoption of modern technology to treat wastewater up to the level of complete reuse that can address the current challenges of fresh water scarcity. Government intervention at the national and local level is needed to develop treatment facilities for wastewater reuse schemes, says Abdul Rahman Mohammed, CEO, Sahara Industry.

India is rapidly becoming urbanised and it is expected, that 50 per cent of its total population will be residing in cities in the next two decades. The estimate suggests that by 2050, the country's cities would witness a net increase of 900 million people. The urbanisation growth leading upto 2050 will see an increase at a CAGR of 2.1 per cent, double than that of China.

With a growing population, the per capita water availability has dropped from 1816 cubic metres in 2001 to 1486 cubic meters in 2021. It is estimated to decline further to 1191 cubic meters by 2050 or may be earlier. At present, only about 70 per cent urban households have access to piped water and the average per capita supply is below the standard 135 litres in many cities. Several cities in India have started facing the water crisis and serious disputes over water are becoming a common phenomenon.

The increasing demand for water is putting tremendous pressure on water resources. To address the situation, innovative wastewater treatment, reclaim and reuse is mandated. The current approach may not be the best way to deal with it in the next 5-10 years. The benefit of having a fresh perspective is looking at new ideas and adoption of modern technology to treat wastewater up to the level of complete reuse that can address the current challenges of fresh water scarcity. Government intervention at the national and local level is needed to develop treatment facilities for wastewater reuse schemes.

Growing environmental impact and climate change have become an aggravating factor causing changes, which reflect on water resources across the world. Some regions are

suffering from prolonged droughts and water depletion whereas others are experiencing more intense floods and devastating hurricanes causing catastrophic damage to coastlines and miles inland. The impact is more hazardous for those regions that mainly depend on agriculture with no technical solutions to provide water.

WATER CHALLENGES

India is the second largest populated country on earth. It is also the second largest water consumer in the world. With a steady growth having 1404 million current population, the country needs around 740 billion cubic meters of water per year to serve its inhabitants. Irrigation is the largest user of fresh water with 88.1 per cent of the total water consumption followed by domestic use at 7.7 per cent and industries consuming about 4.2 per cent.

According to government data, the average annual per capita water availability fell 15 per cent during 2001-2011. It is predicted to fall another 13 per cent by 2025 and further 15 per cent by 2050, which means that in less than 30 years, each Indian household will have about 1.1 million litres of water per year, down from 1.8 million litres in 2011.

Water stress is constantly increasing. The Niti Aayog report suggests that more than 50 per cent of the population today has no access to safe drinking water and about 2 lakh people die every year due to lack of safe water. It also makes the water concerns stronger by stating that at least 40 per cent of the Indian population will have no access to drinking water by 2030.

Water stress has already started inflicting as over 600 million people of

India's total population is living with severe water stress and the report further claims that 21 major cities (including Delhi, Bengaluru, Chennai and Hyderabad) are expected to run out of groundwater affecting at least another 100 million people.

According to Financial Express, by 2030, India's water demand will exceed supply by two times, indicating severe water scarcity in the country. This shortage of water for industrial and residential use is expected to increase the demand for water and wastewater treatment systems. As the demand for better water quality is increasing, the technology for water and wastewater treatment is getting more acceptances and in India it was valued at \$2.1 billion in 2021, projected to register the annual growth of more than 8 per cent during the forecast period of 2022-2027.

WASTEWATER MANAGEMENT

The major challenge in urban India is that estimated 80 per cent of water supplied to households is coming back as wastewater to be treated and for reuse. But in reality, only a fraction of it is treated due to insufficient treatment facilities and lack of infrastructure support. At present, with the entire capacity of sewage treatment plants (STPs) in India, it is able to treat a little over a quarter of the sewage generated per day.

A report by Central Pollution Control Board (CPCB) suggests that the country's urban centres are generating nearly 72,368 MLD (million litres per day) of sewage whereas the installed capacity of STPs is 31,841 MLD. Of this installed capacity, developed and operationalised capacity was 26,869 MLD and out of which only 20,235 MLD was the actual utilised capacity.

With the total 72,368 MLD sewage generated, only 20,235 MLD is treated which is just under 28 per cent of total sewage being treated. India, with an increasing population and growing demand for water is not utilising the valuable resource of wastewater to augment the water supply and cater to the need of industries and irrigation. This leaves a big gap of almost 72 per cent of generated sewage is not being treated and it is released untreated into water bodies.

From the public health perspective, it is estimated that the impact of water borne diseases in the country affects almost 40 million people annually including the death of almost 1.5 million children from diarrhoea alone.

As per a conservative estimate, the industries in India generates around 13468 MLD of industrial wastewater of which about 60 per cent is treated mainly by the large industries. Discharge of industrial wastewater laced with high level of chemicals and heavy metals into natural water bodies also increases the cost for industries located downstream. This discharge may also exceed natural purification capacities and deplete dissolved oxygen below optimum levels that can support marine life. Industries using groundwater as their water sources also cause damage to water bodies and their recharge capacity, resulting in lower groundwater levels.

BEST PRACTICES

Globally, the wastewater management concept endorses utilisation of it as a by-product to the extent possible i.e. Recycle, Reclaim, Re-use and Recharge. Fundamentally, wastewater reuse has to take into consideration rapidly depleting water sources, water contamination, environmental degradation, rigorous policies, and health risks to people.

Singapore is a classic example of successfully adopting smart wastewater management system to meet over 40 per cent of their drinking water needs. A water utility in the Netherlands provides drinking water to 2.5 million consumers and businesses offers processed wastewater that is customised for specific requirements and preferences. Queensland Urban Utility in Australia supports sustainable use of recycled water across its service area with numerous environmental benefits including conservation of water resources, reduced nutrient loads being released into waterways, and improved quality of public assets and support for agriculture where environmental source of water is insufficient.

Such examples of wastewater reclaim and reuse are becoming common across countries as the demand is rising and water sources are depleting with high level of contamination.

Back home, Chennai, has responded to the need for more water amid rapid industrial and population growth by becoming more circular and resilient. It mandated rainwater harvesting and became the first city in India to reuse 10 per cent of collected wastewater, with plans to achieve a reuse rate of 75 per cent. As part of this effort, the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) sells treated wastewater to industrial users and with the additional revenues, it can cover all operating and maintenance costs. The utility is also recovering energy from wastewater in more than half of its wastewater treatment plants and sell most of the bio-solids created by the process as manure for agriculture.

On pan India basis, water reuse is still in the nascent stage with

minimal reclaimed water. The reuse of treated sewage is an issue which hasn't assumed much importance in the policy planning of successive governments. To meet the growing water demand, wastewater reuse is the most sustainable option.

There is tremendous potential for wastewater recycling and reuse mainly for non-potable applications. Sahara Industry has been advocating sustainable water use practices with robust water and wastewater treatment solutions with modern technology and has been part of over 1000 small and large projects. It is providing wastewater treatment and reuse facilities to municipal and industrial segments with cost effective, reliable and innovative solutions to meet their changing needs and market requirements.

City administrations in India must locally plan for implementing pilot projects to be scale up for treated sewage reuse for horticulture, washing activities (road, vehicles and trains), fire-fighting, industrial cooling, toilet flushing and gardening and at large scale to provide it to farmers for agriculture purposes. The reuse of treated sewage can decrease the water demand from surface sources like rivers, ponds, lakes as well as groundwater sources.

GOING AHEAD

World over, many countries are using treated sewage to satisfy their water needs. It offers a solution that could benefit largely in augmenting water supplies and addressing ground and surface water pollution. With the size of industries and agriculture that we have in India, a market for treated wastewater for reuse can be established to maximise the circular use of water. The authorities

at local and state levels in India can push for greater efficiency, effective control, management and reduction of wastewater with adequate funds and infrastructure support as well

as matching policies through a comprehensive strategy and implementation. It is absolutely critical that all stakeholders work together to find a solution to pollution, doing

whatever we can with time, talent, technology and determination.

