

Reuse treated wastewater

Innovative policies could provide the lifeline Bengaluru needs for a sustainable future

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Bengaluru, once known as the "City of Lakes," is now grappling with a severe water crisis. Rapid urbanisation, coupled with climate change and the depletion of natural water sources, has pushed the city to the brink of severe water scarcity. With its burgeoning population and expanding geographical boundaries, finding long-term and sustainable solutions to meet the ever-increasing water demand has become imperative.

Genesis of the Water Crisis

We have to understand the geographical location of Bengaluru, which is a challenge in efficient water management. Bengaluru is situated at a height of 920 m above sea level in a valley between the Western and Eastern Ghats, down south of India, and relies on freshwater transported from four major reservoirs like Krishnaraja Sagar (KRS), Kabini, Harangi, and Hemavathi, covering over 100 km. Although the supply from these reservoirs is an assured source, the supply to an elevated location is highly resource and energy intensive, which adds to the operational, maintenance, and financial woes of the Bangalore Water Supply and Sewage Board (BWSSB).

Further, the addition of 110 villages to the BBMP area in 2008 has seen extensive growth in construction activities, road expansion, and infrastructure development, leading to disruption of natural water systems. Mahadevapura, RR Nagar, Bommanahalli, and Dasarahalli are among the most affected areas lying on the periphery of the core Bengaluru area.

The Current Water Scenario

To understand the severity of Bengaluru's water crisis, let's look at the numbers. The city's daily water demand stands at a massive 2,100 million litres per day (MLD). However, the supply from the Cauvery basin is 1,450 MLD, leaving a deficit of around 650 MLD. Erratic rainfall, exemplified by South-west Monsoon shortfall of 271 mm in 2023 compared to the normal 369 mm, exacerbates Bengaluru's water scarcity. Four major dams' storage levels stood at just 49% in November 2023. Additionally, desilting efforts have left lakes like Bellandur and Varthur dry, further depleting the groundwater reserves.

This situation is compounded by rapid

urbanisation and the disappearance of lakes, with Bengaluru losing nearly 80% of its lakes and 90% of its green cover in the last decades. This rapid urbanisation has led to an overreliance on borewells. With over 10,995 government borewells in the city, water levels have decreased in 3,700 borewells, and 1,214 borewells have completely dried up. The groundwater levels have dropped by more than 1,000 feet in many areas, further aggravating the water crisis.

The Role of Used Water

In the face of this looming water crisis in metropolitan cities like Bengaluru, the reuse of treated wastewater or used



water presents a sustainable, long-term solution offering a multi-faceted approach to address various challenges concurrently. The concept of reuse of treated wastewater is not new for Bengaluru, which generates 1,440 million litres per day (MLD) of wastewater. Of this, 85% is treated, out of which 40% is discharged to rivers, 35% is discharged to lakes for rejuvenation, and a small percentage is reused for industrial and other purposes.

However, with the augmentation of existing capacities and efficiencies of treatment with advanced treatment technology intervention and the support of strong treated water reuse policies in place, Bengaluru could mitigate the impounding water crisis of the decade. To tackle the situation comprehensively, it is suggested that BWSSB reconsider the utilisation of treated wastewater as an effective measure against the prevailing water crisis.

■ **Create sponge cities with the rejuvenation of lakes and water bodies:** The city of lakes, once blessed with more than 1,700 lakes in the 16th century, has now shrunk to less than 200 lakes. By diverting treated wastewater to rivers and lakes, BWSSB can preserve natural ecosystems and effectively recharge bore wells within a 10- to 12-kilometre radius. Although a substantial

portion of treated water, totaling 419 MLD, has been allocated for lake rejuvenation by BWSSB to revive iconic water bodies such as Bellandur Lake, Vengiahnakare Lake, and Yelamallappa Chetti Lake, etc., the delayed process of desilting has limited the percolation process.

■ **Commercial Utilisation of Treated Wastewater:** BWSSB currently supplies treated water for industrial and commercial use, amounting to 18 MLD. Also, BWSSB is promoting the sale of treated water from 24 Secondary Sewage Treatment Plants (STPs) and four Tertiary Sewage Treated Plants (TTPs), as advertised on its website. However, more detailed information should be provided by BWSSB on the quality of treated water available and on possible utilisation. This transparency will enable end-users, particularly industries in water-scarce regions with high water demand, to swiftly access nearby STPs' treated water, enhancing its accessibility and acceptability.

■ **Policy Framework:** Despite BWSSB Sewage Treatment Plants meeting discharge and reuse standards, neglect persists among end-users, particularly in the industrial sector. Maintaining a significant price difference between freshwater and treated water can boost its economic viability and encourage greater reuse. Also, encouraging Public-Private Partnerships (PPPs) in wastewater and water reuse projects can further enhance efficiency and effectiveness by leveraging private sector expertise and resources.

■ **Capacity Building and Public Perception:** Building technical capacity and expertise in wastewater treatment and management is essential to ensuring the efficient operation and maintenance of treatment plants and distribution networks. Overcoming social stigmas and misconceptions surrounding the use of treated wastewater is crucial to garnering public acceptance and support for wastewater reuse initiatives.

Utilising treated wastewater, Bengaluru can enhance water security, diversify sources, and combat future crises. Stakeholders must prioritise reuse initiatives to pave the path for a sustainable future and inspire other cities.

Mandating treated wastewater use and reviving surface water bodies in Integrated Water Management (IWM) Plans can bridge supply-demand gaps. Pricing, policies, enforcement, awareness, and partnerships offer solutions for Indian cities' water crises.

(The writer is an associate director at TERI. She is leading a project with BWSSB on circular economy in wastewater treatment and treated water reuse for Bengaluru)