

## **Urban Wastewater Scenario in India**

Population growth and urbanisation, along with socio-economic development, have intensified the water supply and demand imbalance, leading to water shortage conditions, especially in developing countries like India. As cities continue to grow and consume more water, there is added pressure on agricultural productivity factors such as water, land, energy, and changing diets, bringing major challenges to urban and rural food security.

Additionally, climate change impacts are affecting the availability and distribution of water resources due to extreme floods and droughts. There is an urgent need to wisely use the water resources available to us. In this context, the concept of waste to wealth fits well for water management in India.

### **Wastewater Generation:**

- It is estimated that 380 billion m<sup>3</sup> of wastewater is generated annually across the world.
- Among the global regions, Asia generates the largest volumes of wastewater (42% of the global total) and among the South Asian countries, India has the highest wastewater generation.
- High-income countries (HICs) generate 42% of global wastewater, which is almost twice that of low-income countries (LICs) and lower-middle-income countries.

### **Wastewater Treatment:**

- HICs collect 82% and treat 74% of the majority of their wastewater generated, while LICs collect 9% and treat 4% of their total wastewater generated.
- The wastewater treatment is less than 50% for the upper and lower- middle income countries (MICs).

### **India's Wastewater Scenario:**

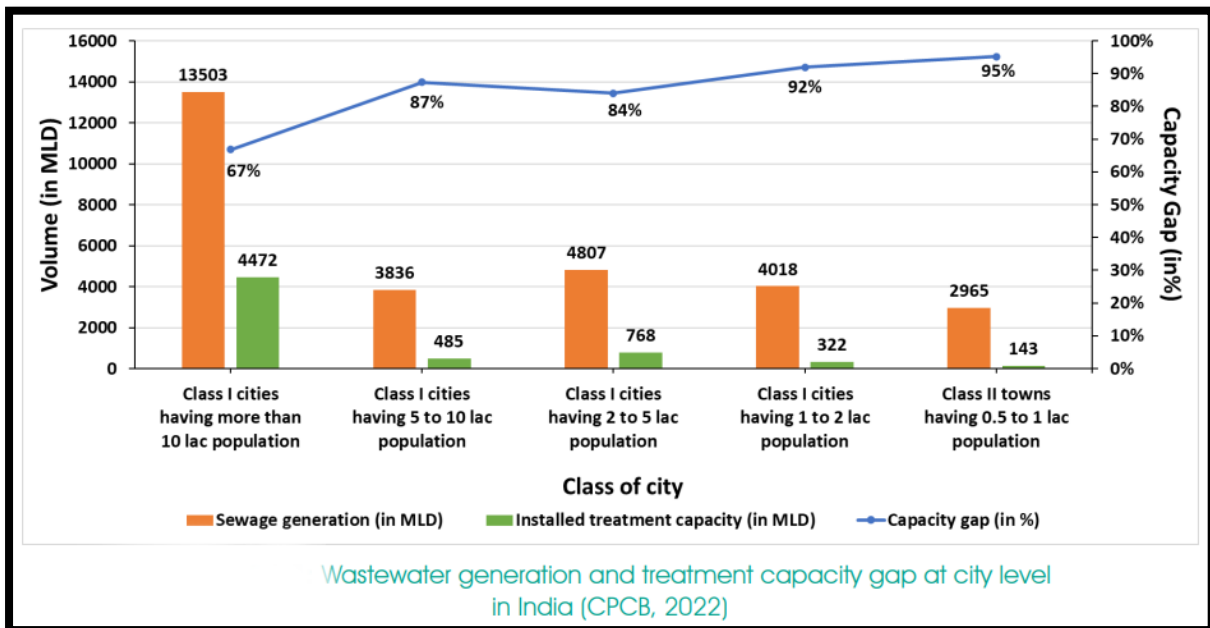
#### **Urban Wastewater Generation and Treatment:**

- About 35% of India's total population is concentrated in urban centres, where the estimated wastewater generation is 72,368 MLD (million litres per day) for the year 2020-21 (as per CPCB).
- This estimate is almost double of its rural counterpart (39,604 MLD).
- The current installed sewage treatment capacity is 31,841 MLD, but the operational capacity is 26,869 MLD, much lower than what is generated.
- Only 28% of the actual quantity of wastewater generated, is treated; 72% of wastewater which is left untreated is disposed of in rivers/lakes/groundwater.

#### **Urbanisation and Wastewater Linkage:**

- More water availability has increased (a) the living standards in urban cities and (b) the pace of urbanisation; thus giving rise to the need for immediate attention to managing wastewater.

- Rapid and unsustainable urbanisation adds pressure on freshwater resources to meet the food and water demands in water-scarce areas and areas where expansions occur at an unprecedented pace.
- Many of these developing cities are located in important river basin catchments, consuming large quantities of freshwater and discharging wastewater back into the catchments, thus contaminating irrigation water.
- This has raised serious concerns and challenges for urban wastewater management.



### Significance of Managing Wastewater:

- **Water Security:** An increasing set of sustainable but unconventional water resources, such as wastewater, holds immense potential to close the water demand-supply gap and achieve a water-secure future.
- **Undervalued Resource in India:** In many countries, wastewater is used as an alternate water source, especially for supplying irrigation water in farmlands. However, in India, wastewater is considered as an “untapped” and “undervalued” resource.
- **Alternate Freshwater:** Apart from reuse, the treated wastewater can also act as a freshwater source and be useful in maintaining the river flow during drought situations.
- **Meeting Industrial Demands:** Wastewater is a highly potential source of water for various purposes and is highly underutilised. For instance, 80% of the untreated wastewater from 110 cities, if utilised, can cater to 75% of the industrial water demand that can be met by 2025

### Challenges Associated to Treating Wastewater:

#### ❖ Quality Challenges:

- It has been observed that the quality of wastewater being reused is poor. The demand for clean water is rising faster than wastewater treatment solutions and quicker than technological advancements in institutions providing safe wastewater access.
  - One of the biggest hurdles to clear while encouraging reuse is to guarantee human health and ecological safety and ensure that wastewater is of appropriate quality before being used or released into the environment.
- ❖ **Regulatory Challenges:**
- The major challenges associated with the standard setting of water pollution include:
    - Diversity of pollutants
    - Variety of targeted uses in which treated/untreated water is being put
    - Amount of dilution that may occur when the pollution load is released to a neighbouring water body
  - Ambient water quality standards are absent for a surface water body which is on the receiving end of treated or untreated domestic sewage. Such lapses basically affect the end users, such as downstream farmers.
- ❖ **Economic Challenges:**
- The capacity gap (between the generated sewage and present treatment capacity) is very large in all classes of towns and cities in India which increases even more with the order of decreasing population.
  - Smaller cities/towns face difficulty in finding necessary resources for setting up STPs, due to higher capital expenditure and operation + maintenance costs. High capital discourages the entry of private players.
- ❖ **Technological Challenges:**
- India has an over-dependence on older technologies for handling wastewater. The limited funds and higher expenditures push the government to choose technologies with lower capital costs despite their poor performance parameters.
  - The knowledge gap, along with the ignorance regarding newer technologies, further leads to the perpetuation of outdated and inefficient technologies.
  - The possibilities of alternate nature-based and decentralized technologies are yet to be explored.
- ❖ **Social Challenges:**
- The citizens are usually not well informed about either water scarcity or the positive outcomes of water reuse/recycling. In many cases, despite the awareness created, people are reluctant to use reclaimed water.
  - Recycled water is very less likely to be accepted for drinking purposes compared to its non-potable purposes like irrigation of parks.
  - The aesthetic aspects of reclaimed water, such as colour, odour, and taste are other crucial factors that shape the public acceptance of treated water.
  - In many parts of the world, schemes related to the reuse of treated water are rolled back due to public opposition.

**References:**

<https://www.drishtiiias.com/summary-of-important-reports/urban-wastewater-scenario-in-india>