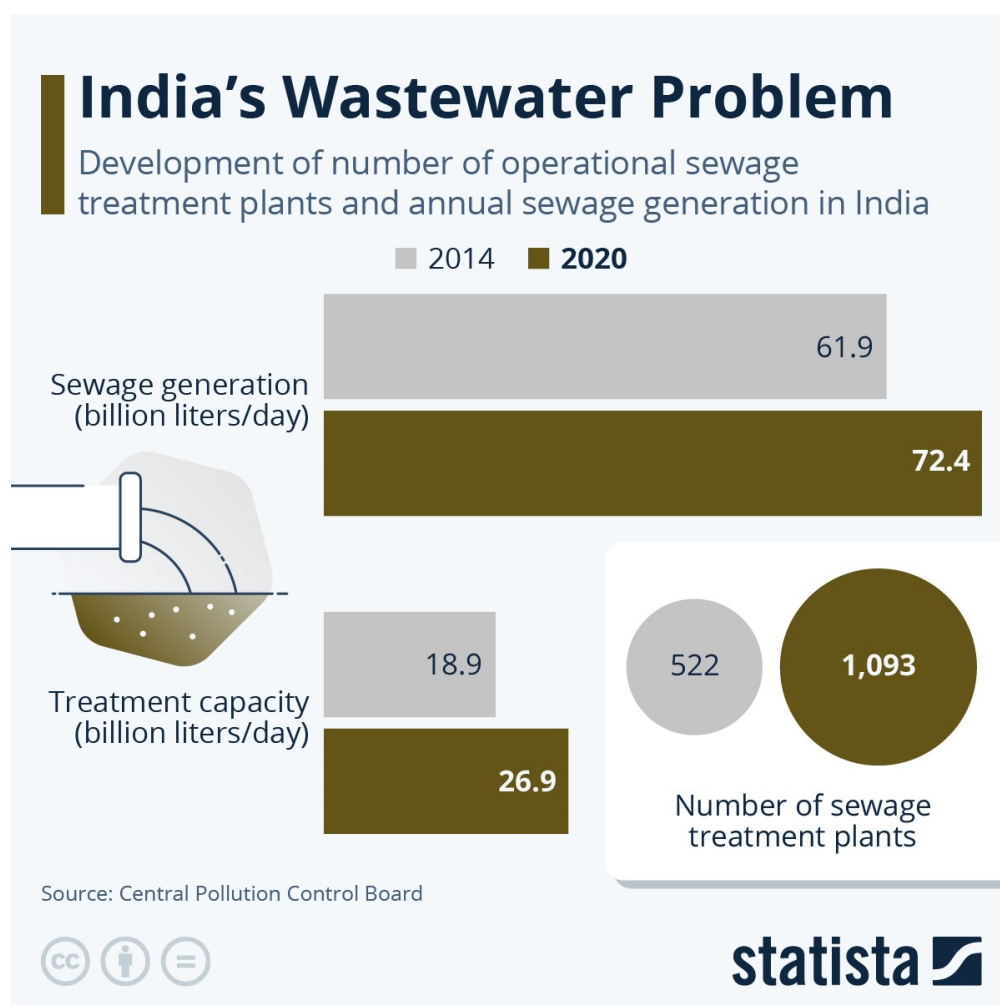


## Waste Water Reuse

### Why in News?

Depleting freshwater sources, erratic rainfall patterns and growing water scarcity underscores the need to adapt innovative water management solutions.

### What are the needs for water reuse?



- **Depleting Freshwater Sources** - Surface water abstractions are reaching unsustainable levels leading to deterioration of the environment.
- **Water Pollution** - Disposal of domestic sewage from cities and towns is the biggest source of pollution of water bodies in India .
- **Erratic rainfall patterns** - Climate change is disrupting normal weather patterns, leading to droughts or excessive rainfall in different parts of India.
- **Growing water scarcity** - According to a 2019 report by the National Institution for Transforming India (NITI Aayog), India's water demand will exceed supply by a factor of two by 2030.

India has only 4% of the world's fresh water resources despite a population of over 1.4 billion people.

- **Increasing Population** - By 2050, 50% of the country's population will be in urban cities posing challenges for urban wastewater management.
- **Resource Utilization** - The failure to reuse treated wastewater also underutilises the substantial capital invested in sewage treatment plants.

### What are the benefits of water reuse?

- **Ground Water Boost** - Treated water can be used to recharge groundwater to improve groundwater levels and quality.

*National water quality standards on sewage treatment for discharge into surface water bodies are prescribed by CPCB.*

- **Agricultural Growth** - Use of treated wastewater address irrigation needs of agriculture and improve productivity which results in increased farmers income.
- **Economic Growth** - Treated waste water can be used in livestock and fish production.
- **Boost Circular Economy** - Water recycling systems support a circular economy in the water sector.
- **Economic Potential** - Wastewater sector in India is developing at a rate of 10-12 % each year and is likely to exceed \$4 billion.
- **Conserving water and Money** - Wastewater recycling in thermal power plants can yield a monetary benefit of on average Rs 300 million per year and water savings of nearly 10 million cubic metres a year.
- **Nutrient Recycling** - Nutrients found in wastewater like nitrogen, phosphorus and potassium if recovered can be used to reduce reliance on synthetic fertilisers.

*Sewage generated from class I and II cities across India 6,400 million litres per day has a nutrient load of about 2,500 tonnes.*

- **Local Body Financial Autonomy** - Local bodies can generate an additional annual revenue by selling treated water.

### What are the challenges?

- **Inadequate Treatment** - only 28 % of the total sewage generated is effectively treated
- **Insufficient infrastructure** - There remains a gap of 22939 MLD (78.7%) between sewage generation and installed sewage treatment capacity.

*All Class I cities and Class II towns together generate an estimated 29129 MLD*

*sewage (as per population in 2001 census) and the installed sewage treatment capacity is only 6190 MLD.*

- **Low Reuse** - a mere 3 % of this treated wastewater is used beneficially and most of it discharged into water bodies or used for non-essential purposes such as irrigating public parks.
- **Absence of Guidelines** - Sector wise quality standards of treated water reuse have not been issued.
- Different sectors have distinct requirements of processed water quality ranging from biological treatment to reverse osmosis or ultrafiltration to meet quality standards.
- **Inadequate Research and Technologies** - R&D initiatives are deficient and require boosting of investment to foster innovation.
- **Lack of Private Participation** - Almost all of the sewage treatment plants are run by the government and public sector.
- **Inadequate Skilled Personnel** - There is huge requirement of human resources in operation, maintenance and research side of water treatment sector.
- **Socio-cultural Barriers** - Caste ,Class differences and public misconception often prevent the acceptance of reused water.
- **Financial Constraint** - The high capital costs of setting up wastewater treatment facilities and advanced technologies, such as zero liquid discharge, discourages industries and municipalities from embracing it.

### **What needs to be done to improve waste water reuse ?**

- To encourage greater water reuse, India must prioritise infrastructure development, implement sound policies and allow private sector participation.
- Encourage states and local bodies to adopt National Framework on Safe Reuse of Treated Water.
- Encourage private sector participation through Public- Private Partnership (PPP) models to cover through technology selection, fund rotation, and execution.
- Setup water reuse benchmarks for industries to promote wastewater reuse and resources recovery, without compromising on product quality.
- Implement policies to incentivise industries, research institutions and universities to undertake R&D initiatives on innovative water treatment technologies, water efficiency practices.
- Higher tariffs for non-recycled water will encourage municipalities and housing societies to adopt recycled water for non-potable purposes.
- Similar to carbon credits, entities that use treated wastewater could receive water-use credits, which could be monetised or traded with other developers.

### **Quick Facts**

#### **Sewage Treatment Plants Technologies**

- Activated Sludge Process (ASP)
- Sequencing Batch Reactors (SBR)

- Extended Aeration (EA)
- Up flow Anaerobic Sludge Blanket (UASB)
- Moving Bed Biofilm Reactor (MBBR)
- Fluidized Aerobic Bed Reactor (FAB)
- Waste Stabilization Pond (WSP)
- Oxidation Pond (OP)
- Zero Liquid Discharge
- Others (Aerated Lagoon (AL), Bio-Tower, Electro Coagulation (EC) etc.)

## References

[Down To Earth | India Water Use](#)

