

India Wastewater Treatment Market By Type (Membrane Separation, Biological, Disinfection, Sludge Treatment), By Process (Primary Treatment, Secondary Treatment, Tertiary Treatment), By Application (Municipal, Industrial) By Region, Competition, Forecast & Opportunities, 2020-2030F

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Abstracts

India Wastewater Treatment Market was valued at USD 6.67 Billion in 2024 and is expected to reach USD 9.60 Billion by 2030 with a CAGR of 6.10% during the forecast period.

Wastewater treatment is the process of removing contaminants, impurities, and harmful substances from wastewater to make it safe for discharge into the environment or reuse. This process involves a series of physical, chemical, and biological treatments designed to purify water from domestic, industrial, or agricultural sources. The primary goal is to protect public health, prevent pollution, and conserve water resources.

The treatment process typically occurs in stages. The primary stage removes larger particles like debris and sediment through filtration and sedimentation. The secondary stage uses biological processes, such as the activity of microorganisms, to break down organic matter and reduce harmful substances. In some cases, a tertiary stage is employed to further refine the water, removing nutrients, pathogens, and remaining contaminants through advanced filtration, chemical treatments, or UV disinfection.

By treating wastewater, the risk of environmental degradation is minimized, ensuring that ecosystems remain healthy and that water can be safely reused for purposes such as irrigation or industrial operations. Wastewater treatment is an essential component of

modern water management systems, contributing to sustainable development and the responsible use of natural resources.

Key Market Drivers

Stringent Environmental Regulations and Government Policies

The Indian government has implemented stringent environmental regulations to curb pollution caused by untreated wastewater, which is a major driver for the wastewater treatment market. Laws such as the Water (Prevention and Control of Pollution) Act, 1974, mandate industries to treat wastewater before discharge into the environment. Similarly, the National Green Tribunal (NGT) actively monitors industrial compliance and imposes heavy penalties for violations, incentivizing industries to invest in wastewater treatment technologies.

Government initiatives like the Namami Gange Programme, aimed at rejuvenating the Ganga River, emphasize the construction of modern sewage treatment plants across cities along the river. Additionally, the Central Pollution Control Board (CPCB) has set strict guidelines for industries to adopt zero-liquid discharge (ZLD) systems to minimize water wastage.

Public-private partnerships (PPPs) are also being encouraged to fund large-scale wastewater management projects. These regulatory measures ensure accountability and compliance, fostering a robust market for advanced wastewater treatment technologies such as reverse osmosis, UV disinfection, and sludge management solutions.

Water Scarcity and the Growing Need for Water Reuse

India is facing acute water scarcity due to increasing demand from agriculture, industry, and domestic consumption. With 18% of the global population but only 4% of the world's freshwater resources, India is under significant water stress. This growing scarcity has highlighted the need for wastewater treatment and water recycling as essential measures for sustainable water management.

Treated wastewater offers a reliable alternative to freshwater for industrial and agricultural use. Industries, particularly those in water-intensive sectors like textiles, power, and chemicals, are adopting wastewater recycling to meet their operational requirements while complying with regulatory mandates. Treated water is also being

used for irrigation, landscaping, and non-potable urban applications, reducing the strain on freshwater resources.

Innovative technologies, such as tertiary treatment, advanced filtration, and nutrient recovery, are gaining traction in India. Government schemes like the Jal Shakti Abhiyan focus on water conservation and emphasize wastewater reuse as a critical strategy for tackling water scarcity. The increasing recognition of treated wastewater as a valuable resource is driving demand for efficient and cost-effective wastewater treatment systems across sectors. India has an annual water availability of around 1,400 cubic meters per person, which is considered to be below the threshold of water scarcity (1,700 cubic meters per person). This availability is expected to decline with increasing population. India generates about 62,000 million liters per day (MLD) of wastewater, but only 30% of this wastewater is treated. The rest is often discharged untreated into water bodies, exacerbating pollution and limiting available fresh water.

Industrial Growth and Rising Demand for Sustainable Practices

India's rapidly expanding industrial sector is a significant driver of the wastewater treatment market. Sectors such as manufacturing, pharmaceuticals, food and beverage, and energy production generate large volumes of wastewater that require treatment to meet regulatory discharge standards. As industries strive to align with global environmental and sustainability goals, they are increasingly adopting advanced wastewater treatment solutions.

Industries are also under pressure to adopt sustainable practices due to the global focus on ESG (Environmental, Social, and Governance) frameworks. Implementing wastewater treatment systems helps industries reduce their environmental footprint, conserve water, and enhance their reputation among stakeholders. Technologies like effluent treatment plants (ETPs), biological treatment, and sludge management systems are being widely adopted to meet these sustainability objectives.

The growth of industrial clusters and special economic zones (SEZs) has further spurred the demand for centralized wastewater treatment facilities. These clusters often require large-scale treatment systems to handle effluents from multiple industries efficiently. In addition, industries are investing in circular water management practices, such as reusing treated water and recovering valuable byproducts like biogas from sludge, to achieve cost savings and operational efficiency.

The rise of industrialization, coupled with increasing awareness of sustainable water

management practices, continues to drive innovation and growth in India's wastewater treatment market. India's industrial sector is growing at a steady rate of about 7-8% annually, contributing to roughly 29-30% of the country's GDP. This sector includes manufacturing, mining, construction, and utilities.

Key Market Challenges

Inadequate Infrastructure and Investment Gaps

One of the major challenges facing the wastewater treatment market in India is the lack of adequate infrastructure and the significant investment gaps required to address the growing demand for wastewater management. A large proportion of urban and rural areas still lack access to proper sewage systems, leading to the discharge of untreated wastewater into rivers, lakes, and other natural water bodies. According to reports, only about 30% of the total wastewater generated in India is treated, while the remaining untreated water contributes to environmental pollution and public health risks.

The existing wastewater treatment plants (WWTPs) are often outdated, inefficient, or operating below capacity due to poor maintenance and funding constraints. Many smaller towns and rural areas face a complete absence of sewage treatment facilities, and local governing bodies struggle to allocate sufficient funds for the development and maintenance of wastewater infrastructure. Even in urban areas, the rapid growth of cities has outpaced the development of sewer networks and treatment plants, creating a massive backlog in wastewater management. Additionally, financial limitations and the high upfront costs associated with installing advanced treatment technologies pose significant barriers for municipalities and industries. Small and medium enterprises (SMEs), in particular, find it challenging to invest in costly wastewater treatment solutions due to budget constraints. While public-private partnerships (PPPs) are gaining traction, the overall funding ecosystem for wastewater projects remains underdeveloped.

This infrastructure deficit is further exacerbated by a lack of skilled professionals and technical expertise to design, operate, and maintain wastewater treatment systems efficiently. Addressing these challenges requires sustained investments, policy interventions, and capacity-building initiatives to ensure the scalability and effectiveness of wastewater management systems across the country.

Low Awareness and Public Participation

Another significant challenge for the wastewater treatment market in India is the low level of awareness and public participation in wastewater management. Despite increasing environmental concerns, there remains a widespread lack of understanding among the general public and stakeholders about the importance of wastewater treatment and its long-term benefits for health, the environment, and water conservation.

In many regions, untreated sewage and industrial effluents are discharged directly into rivers and lakes, often due to negligence and the absence of a culture of environmental responsibility. Individuals, communities, and industries may prioritize short-term cost savings over the environmental and societal benefits of proper wastewater treatment, leading to resistance in adopting advanced treatment technologies or investing in decentralized solutions.

This lack of awareness is also evident in the limited adoption of wastewater reuse practices. Treated wastewater, which can be an invaluable resource for non-potable applications such as irrigation and industrial cooling, is underutilized due to misconceptions about its safety and quality. Poor public education campaigns and inadequate government outreach efforts further contribute to the slow acceptance of wastewater reuse. Additionally, non-compliance with wastewater discharge regulations by industries is often driven by insufficient understanding of environmental laws or a perception that enforcement is lax. Strengthening enforcement mechanisms and promoting greater awareness through educational campaigns, incentives, and penalties can help foster a culture of accountability.

Improving public participation in wastewater management requires a collaborative approach involving the government, NGOs, industries, and citizens. Community engagement initiatives, public education programs, and campaigns highlighting the benefits of wastewater treatment and reuse can play a crucial role in overcoming this challenge.

Key Market Trends

Growing Adoption of Decentralized Wastewater Treatment Systems

One of the emerging trends in India's wastewater treatment market is the increasing adoption of decentralized wastewater treatment systems (DWTS). These systems are designed to treat wastewater at or near its source, making them highly effective for areas where centralized treatment plants and extensive sewer networks are not

feasible. Decentralized systems are particularly beneficial in peri-urban areas, small towns, gated communities, industrial clusters, and institutions like schools and hospitals.

DWTS solutions are gaining traction due to their cost-effectiveness, scalability, and flexibility in design. They are easier to install and maintain compared to large centralized plants and require less land and infrastructure. Technologies such as membrane bioreactors (MBRs), moving bed biofilm reactors (MBBRs), and constructed wetlands are commonly used in decentralized systems to ensure high-quality treatment with minimal environmental impact.

The growing emphasis on water reuse and recycling is also driving the adoption of decentralized systems. Treated water from these systems can be used for landscaping, irrigation, toilet flushing, and industrial processes, helping to conserve freshwater resources. Additionally, the Indian government is promoting decentralized wastewater solutions under programs like the Swachh Bharat Mission (SBM) and Atal Mission for Rejuvenation and Urban Transformation (AMRUT), which encourage local bodies to develop sustainable and affordable wastewater treatment facilities. Around 69% of India's population resides in rural areas and small towns, where centralized wastewater treatment infrastructure is often lacking or underdeveloped. Decentralized treatment systems are increasingly being implemented in these regions to cater to local wastewater treatment needs.

Rising Demand for Advanced Treatment Technologies

The India wastewater treatment market is witnessing a surge in demand for advanced treatment technologies to address the increasing complexity of wastewater pollutants. Traditional treatment methods like primary and secondary treatment are often insufficient for removing emerging contaminants such as pharmaceuticals, pesticides, heavy metals, and microplastics, which are becoming prevalent in industrial and municipal wastewater streams.

Advanced technologies like reverse osmosis (RO), ultrafiltration (UF), and nanofiltration (NF) are being increasingly adopted for tertiary treatment and wastewater recycling applications. Additionally, innovations in biological treatment methods, such as anaerobic membrane bioreactors (AnMBRs) and hybrid systems, are providing efficient solutions for organic matter and nutrient removal.

The growing focus on zero-liquid discharge (ZLD) policies in industries like textiles, chemicals, and power plants has further fueled the adoption of advanced treatment

solutions. These technologies enable complete water recovery and minimize waste generation, aligning with sustainability goals. With stricter environmental regulations and rising awareness about water pollution, advanced treatment systems are expected to play a pivotal role in the evolution of India's wastewater treatment landscape.

Segmental Insights

Type Insights

The Biological held the largest market share in 2024. Biological treatment dominates the India wastewater treatment market primarily because of its cost-effectiveness, efficiency in treating organic pollutants, and compatibility with diverse wastewater streams. This process, which relies on microorganisms to degrade organic matter, is well-suited for addressing the high levels of biodegradable waste typically present in municipal sewage and industrial effluents.

India generates a significant volume of wastewater from urban areas and industries such as food processing, textiles, pharmaceuticals, and chemicals. These sources often produce effluents rich in organic contaminants, which biological treatment processes, such as activated sludge, sequencing batch reactors (SBRs), and moving bed biofilm reactors (MBBRs), are highly efficient at managing. The affordability of biological systems makes them particularly appealing for municipalities and industries seeking cost-effective solutions to comply with regulatory discharge standards.

Biological treatment systems are scalable and can be deployed across various plant sizes, from small decentralized systems to large-scale centralized facilities. This versatility aligns well with India's diverse infrastructure needs, spanning urban centers, industrial clusters, and rural areas.

Government regulations and programs, such as the Namami Gange initiative and stricter enforcement of effluent treatment norms by the Central Pollution Control Board (CPCB), have further driven the adoption of biological systems. These systems are favored for their reliability in achieving compliance with standards for biological oxygen demand (BOD) and chemical oxygen demand (COD).

As India continues to tackle urbanization, industrialization, and water pollution, biological treatment remains the most viable option for wastewater management due to its proven efficiency, cost advantages, and adaptability to diverse wastewater profiles. While advanced technologies like membrane filtration are gaining momentum, biological

processes remain dominant due to their critical role in India's overall wastewater treatment strategy.

Regional Insights

South India held the largest market share in 2024. South India, particularly states like Tamil Nadu, Karnataka, Andhra Pradesh, and Telangana, has seen rapid industrial growth in recent decades. This region hosts a large number of industries, including textiles, chemicals, pharmaceuticals, food processing, and power generation, all of which generate substantial amounts of wastewater. The demand for wastewater treatment solutions has surged as these industries are required to comply with strict environmental regulations for wastewater discharge. The region's urban centers, such as Chennai, Bengaluru, Hyderabad, and Kochi, are also expanding rapidly, resulting in an increased need for municipal wastewater treatment facilities to handle growing populations and urban waste.

The southern states have been proactive in implementing government-led initiatives to address water pollution and wastewater management. Programs such as the Namami Gange (which focuses on cleaning major rivers) and the Swachh Bharat Mission (focused on sanitation and waste management) have been adapted in Southern states to develop better infrastructure. Additionally, state-level policies in Tamil Nadu and Karnataka, among others, focus on encouraging industries to invest in wastewater treatment to meet stringent discharge standards. The presence of regulatory bodies such as the Tamil Nadu Pollution Control Board (TNPCB) ensures better enforcement of environmental laws, fostering the adoption of wastewater treatment technologies.

South India is also a leader in adopting advanced wastewater treatment technologies. Cities like Chennai and Bengaluru have implemented innovative solutions, such as decentralized wastewater treatment systems, reverse osmosis, and advanced biological treatment processes. The presence of strong industrial hubs also supports the development and implementation of cutting-edge wastewater treatment technologies.

Key Market Players

Veolia Environnement S.A.

SUEZ S.A.

Xylem

A. O. Smith Corporation

Pentair plc

IDEX Corporation

Danaher Corporation

General Electric Company

Report Scope:

In this report, the India Wastewater Treatment Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

India Wastewater Treatment Market, By Type:

Membrane Separation

Biological

Disinfection

Sludge Treatment

India Wastewater Treatment Market, By Process:

Primary Treatment

Secondary Treatment

Tertiary Treatment

India Wastewater Treatment Market, By Application:

Municipal

Industrial

India Wastewater Treatment Market, By Region:

South India

North India

West India

East India

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the India Wastewater Treatment Market.

Available Customizations:

India Wastewater Treatment Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

Contents

1. PRODUCT OVERVIEW

- 1.1. Market Definition
- 1.2. Scope of the Market
 - 1.2.1. Markets Covered
 - 1.2.2. Years Considered for Study
- 1.3. Key Market Segmentations

2. RESEARCH METHODOLOGY

- 2.1. Objective of the Study
- 2.2. Baseline Methodology
- 2.3. Formulation of the Scope
- 2.4. Assumptions and Limitations
- 2.5. Sources of Research
 - 2.5.1. Secondary Research
 - 2.5.2. Primary Research
- 2.6. Approach for the Market Study
 - 2.6.1. The Bottom-Up Approach
 - 2.6.2. The Top-Down Approach
- 2.7. Methodology Followed for Calculation of Market Size & Market Shares
- 2.8. Forecasting Methodology
 - 2.8.1. Data Triangulation & Validation

3. EXECUTIVE SUMMARY

4. VOICE OF CUSTOMER

5. INDIA WASTEWATER TREATMENT MARKET OUTLOOK

- 5.1. Market Size & Forecast
 - 5.1.1. By Value
- 5.2. Market Share & Forecast
 - 5.2.1. By Type (Membrane Separation, Biological, Disinfection, Sludge Treatment)
 - 5.2.2. By Process (Primary Treatment, Secondary Treatment, Tertiary Treatment)
 - 5.2.3. By Application (Municipal, Industrial)
 - 5.2.4. By Region (South India, North India, West India, East India)

- 5.2.5. By Company (2024)
- 5.3. Market Map

6. SOUTH INDIA WASTEWATER TREATMENT MARKET OUTLOOK

- 6.1. Market Size & Forecast
 - 6.1.1. By Value
- 6.2. Market Share & Forecast
 - 6.2.1. By Type
 - 6.2.2. By Process
 - 6.2.3. By Application

7. NORTH INDIA WASTEWATER TREATMENT MARKET OUTLOOK

- 7.1. Market Size & Forecast
 - 7.1.1. By Value
- 7.2. Market Share & Forecast
 - 7.2.1. By Type
 - 7.2.2. By Process
 - 7.2.3. By Application

8. WEST INDIA WASTEWATER TREATMENT MARKET OUTLOOK

- 8.1. Market Size & Forecast
 - 8.1.1. By Value
- 8.2. Market Share & Forecast
 - 8.2.1. By Type
 - 8.2.2. By Process
 - 8.2.3. By Application

9. EAST INDIA WASTEWATER TREATMENT MARKET OUTLOOK

- 9.1. Market Size & Forecast
 - 9.1.1. By Value
- 9.2. Market Share & Forecast
 - 9.2.1. By Type
 - 9.2.2. By Process
 - 9.2.3. By Application

10. MARKET DYNAMICS

10.1. Drivers

10.2. Challenges

11. MARKET TRENDS & DEVELOPMENTS

12. INDIA ECONOMIC PROFILE

13. COMPANY PROFILES

13.1. Veolia Environnement S.A.

13.1.1. Business Overview

13.1.2. Key Revenue and Financials

13.1.3. Recent Developments

13.1.4. Key Personnel/Key Contact Person

13.1.5. Key Product/Services Offered

13.2. SUEZ S.A.

13.2.1. Business Overview

13.2.2. Key Revenue and Financials

13.2.3. Recent Developments

13.2.4. Key Personnel/Key Contact Person

13.2.5. Key Product/Services Offered

13.3. Xylem

13.3.1. Business Overview

13.3.2. Key Revenue and Financials

13.3.3. Recent Developments

13.3.4. Key Personnel/Key Contact Person

13.3.5. Key Product/Services Offered

13.4. A. O. Smith Corporation

13.4.1. Business Overview

13.4.2. Key Revenue and Financials

13.4.3. Recent Developments

13.4.4. Key Personnel/Key Contact Person

13.4.5. Key Product/Services Offered

13.5. Pentair plc

13.5.1. Business Overview

13.5.2. Key Revenue and Financials

13.5.3. Recent Developments

13.5.4. Key Personnel/Key Contact Person

13.5.5. Key Product/Services Offered

13.6. IDEX Corporation

13.6.1. Business Overview

13.6.2. Key Revenue and Financials

13.6.3. Recent Developments

13.6.4. Key Personnel/Key Contact Person

13.6.5. Key Product/Services Offered

13.7. Danaher Corporation

13.7.1. Business Overview

13.7.2. Key Revenue and Financials

13.7.3. Recent Developments

13.7.4. Key Personnel/Key Contact Person

13.7.5. Key Product/Services Offered

13.8. General Electric Company

13.8.1. Business Overview

13.8.2. Key Revenue and Financials

13.8.3. Recent Developments

13.8.4. Key Personnel/Key Contact Person

13.8.5. Key Product/Services Offered

14. STRATEGIC RECOMMENDATIONS

15. ABOUT US & DISCLAIMER

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