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SEWAGE TREATMENT MARKET IN INDIA 2019

Key Trends, Government Initiatives, Emerging
Technologies and Upcoming Opportunities

- ❖ Report (PDF)
- ❖ Data-set (Excel)

MUNICIPAL SOLID WASTE IN INDIA 2019

Key Takeaways and The Road Ahead

- ❖ Report (PDF)
- ❖ Data-set (Excel)

Key Takeaways

- A little over one-third of the population, close to 500 million Indians, live in cities and generate the bulk of India's national income, accounting for about 70 per cent of the GDP.
- The urban population is growing rapidly, both due to migration from rural areas as well as the urbanisation of rural settlements, which are being rapidly built up. This rapid urbanisation has led to a significant increase in the demand for civic services, which includes managing urban water resources and liquid waste. And this demand already far outstrips the available service capacity.
- Over the past three to four years, the government has paid greater attention to improving sewage management practices, especially in urban areas. As a result, the sewerage sector has witnessed a surge in activity in terms of launch of new programmes and schemes and project uptake during this period. While a huge generation-treatment gap still exists, rising government expenditure and increasing private sector interest have provided the much-needed impetus to the sector.
- Over the course of the past few years, the sewerage sector has witnessed some important trends. Decentralised STPs have been commissioned, recycling and reuse have gained greater acceptance, energy generation from sewage is receiving greater focus, and advanced membrane-based treatment technologies are being deployed.
- Advanced sewage technologies such as sequencing batch reactor (SBR), moving bed biofilm reactor (MBBR) and membrane bioreactor (MBR) are being widely utilised to improve the quality of treated sewage, and optimise O&M costs and land requirements.
- Based on the projects tracked by India Infrastructure Research, the sewerage sector offers a lucrative pipeline of at least 103 projects (announced/proposed/planned/under bidding) entailing a combined investment of more than Rs 355 billion. These projects will create at least 6,480 mld of sewage treatment capacity and 4,480 km of sewer network.
- Given the limited funds with the government, the private sector must also play a part by investing in projects for bridging the gap between sewage generation and treatment capacity, encouraging judicious use of freshwater resources by adopting advanced technologies and processes, and creating profitable markets for wastewater by-products.
- Over the next couple of years, investment in the sector will be directed towards improving treatment efficiency and encouraging wastewater recycling and reuse, besides the customary focus on asset creation. The challenge will lie in expanding network coverage and encouraging a large number of civic agencies to implement these initiatives.
- Eventually, the successful and timely completion of projects will depend on project structuring, political support, credible and updated data systems, revenue streams and the financial health of ULBs.

SECTION I: MARKET ANALYSIS, OUTLOOK AND OPPORTUNITIES**1. Size and Growth**

- ❖ Sewerage Sector Snapshot
- ❖ Current Size and Growth
 - Sewage Generation
 - Treatment Capacity
 - Treatment-Generation Gap
- ❖ Institutional Framework
- ❖ Standards and Norms
- ❖ Key Trends
- ❖ Government Initiatives
- ❖ Risks and Challenges
- ❖ Future Outlook and Projections (2019-20 to 2024-25)

2. Recent Developments

- ❖ Recent Regulatory Developments
- ❖ Project Completions
- ❖ Recent Contract Awards
- ❖ Projects Approved/Launched/Proposed
- ❖ City-level ICT Initiatives
- ❖ Other Key Developments

3. Project Pipeline and Analysis

- ❖ Overall Project Pipeline
- ❖ Project Pipeline Analysis
 - By Region
 - By State
 - By Stage of Development
 - By Ownership
 - By Completion Period
- ❖ Expected Capacity Addition
 - Sewage Treatment Capacity
 - Sewer Network Length
- ❖ Upcoming Opportunities

4. Future Outlook and Market Opportunities

- ❖ Key Growth Drivers
- ❖ Investment Requirements
- ❖ Market Opportunities
 - EPC Contractors
 - Private Developers
 - Technology Providers
 - Equipment and Material Suppliers
 - Pipe Manufacturers
 - Consultants
- ❖ Outlook and Projections (till 2024-25)

5. Key Government Programmes: Progress So Far, Upcoming Projects and Opportunities

- ❖ Swachh Bharat Mission
- ❖ Namami Gange Programme
- ❖ Smart Cities Mission
- ❖ Atal Mission for Rejuvenation and Urban Transformation

6. Inter-City Comparison: Infrastructure Growth, Plans and Projections

- ❖ Key Cities Covered
- ❖ Analysis of Sewage Generation
- ❖ Analysis of Sewage Treatment Capacity Analysis of Number of STPs
- ❖ Analysis of Sewage Network
- ❖ Profiles of Key Cities
 - Sewage Generation
 - Current Sewerage Infrastructure
 - Sewage Treatment Technologies Deployed
 - Innovations and Advancements
 - Recycle and Reuse Practices and Initiatives
 - Key Completed Projects
 - Key Ongoing Projects
 - Capacity Addition Plans

7. Profiles of Top 50 Upcoming Projects

- ❖ Under Bidding
- ❖ Recently Awarded
- ❖ Announced
- ❖ Approved
- ❖ Opportunities for Stakeholders

8. Investment Trends and Outlook

- ❖ Key Funding Sources
- ❖ Overall Investment Trends
- ❖ Union Budget 2019-20: Announcements and Expected Impact
- ❖ New and Innovative Funding Sources (municipal bonds, etc.)
- ❖ The PPP Experience and Potential
 - Formats and Models
 - PPP Experience (1990s-2016)
 - PPP Experience (Post 2016)
 - Key Projects (completed and ongoing)
 - Future Outlook and Potential
- ❖ Key Risks and Challenges
- ❖ Investment Outlook

9. Experience and Opportunities under the Hybrid Annuity Model

- ❖ Introduction
- ❖ HAM: Salient Features
- ❖ Experience So Far
- ❖ One City, One Operator under HAM
- ❖ Key Projects
 - o Ongoing
 - o Tendering , Recently Awarded
- ❖ Risks and Challenges

10. Cost Structures, Tariff Trends and Project Returns

- ❖ Project Economics: Wastewater Treatment Plants (WWTPs)
- ❖ Capex and Opex Requirements
- ❖ Energy and Land Requirements of WWTPs
- ❖ Market for Byproducts (Sludge, Treated Wastewater, Electricity, etc.)
- ❖ Scope of Returns and Revenue Potential
- ❖ Tariffs - Reforms and Trends
- ❖ Issues and Concerns

11. Key Private Players

- ❖ Industry Structure
- ❖ Contracting Practices and Experience
- ❖ Key Players (Indian and Global)
- ❖ Project Portfolio
- ❖ Key Completed Projects
- ❖ Key Ongoing Projects
- ❖ Financial Performance
- ❖ Key Industry Concerns
- ❖ Future Plans

SECTION II: NEW FOCUS AREAS**12. Decentralised Sewerage Systems**

- ❖ Introduction
- ❖ Salient Features
- ❖ The Experience So far/Current Deployment
- ❖ Capital Cost Requirements

- ❖ Select Case Studies
- ❖ Key Advantages
- ❖ Constraining Factors
- ❖ Future Outlook

13. Energy from Sewage

- ❖ Existing Capacity and Plants
- ❖ Relevant Technologies
- ❖ Key Upcoming Projects
- ❖ Energy Generation
- ❖ Future Potential

14. Recycle and Reuse Practices

- ❖ Current Practices
- ❖ Standards and Norms for Reuse
- ❖ Relevant Technologies
- ❖ Key Recycle and Reuse Facilities
- ❖ Key Consumers of Recycled Wastewater
- ❖ Issues and Challenges
- ❖ Future Potential

15. Focus on Industrial Effluent Management

- ❖ Current Effluent Generation
- ❖ Discharge Standards and Norms
- ❖ Existing Treatment Facilities
- ❖ Key Ongoing and Upcoming Facilities
- ❖ Recycle and Reuse Practices
- ❖ Innovations and Advancements
- ❖ Segment Outlook

SECTION III: TECHNOLOGY AND EQUIPMENT**16. Treatment Technologies and Asset Management**

- ❖ Salient Features of Key Technologies
 - Conventional Technologies
 - Advanced Technologies
- ❖ Cost and Performance Comparison of Key Technologies
- ❖ Current Capacity and Key Plants
- ❖ Asset Management
- ❖ Case Studies: Automation and Instrumentation Initiatives
- ❖ Segment Outlook

17. Emerging Equipment Requirements

- ❖ Equipment Market Size and Growth
- ❖ Key Equipment Required
- ❖ Major Players
- ❖ Innovations and Advancements
- ❖ Future Demand Projections

SECTION IV: DATABASE OF KEY PROJECTS

The database will be a compilation of upcoming projects (ongoing and planned) in the sector including sewage treatment facilities (WWTPS), sewage pumping stations, sewage pipelines, recycle and reuse facilities, and effluent treatment plants with details on scope, location, cost, capacity, funding sources, implementing agency, contractor (wherever available), current status, expected date of completion, etc

Current scenario

- Average waste generation has risen from 0.11 kg per head per day in 2014-15 to the current level of 0.5 kg per head per day. This is likely to rise to 1 kg per head per day in the next few years.
- The state of solid waste management (SWM) in the country has improved over the years in terms of waste collection and processing; however, a lot still needs to be done for efficient collection and scientific disposal of waste.
- The share of biodegradable waste has increased from 47% in 2015 to over 53% at present. Moreover, there are increasing quantities of plastics in the waste stream.
- Currently, 76,851 wards of the total 84,458 wards, i.e. 91% of wards, are practicing 100% door-to-door collection, 55,181 wards of the total 84,458 wards, i.e. 65% of wards, are practicing 100% source segregation, and 56% of waste generated (total waste generation is 145,441 mt per day) is being processed which was close to 18% in 2014.

Emerging trends

- Deployment of smart bins, tracking of garbage pickup trucks as well as the sanitation workers, route optimisation for trucks, cross-checking of garbage weight, etc. can efficiently address the challenges of enforcement and transparency. Similarly, IoT-enabled sensors can also monitor the amount of alternate fuel generated from the processed waste.
- Management information systems such as radio-frequency identification (RFID), global positioning system (GPS), geographic information system (GIS) and general packet radio services (GPRS) are being deployed by ULBs for effective solid waste management.
- The country's solid waste management sector is growing on the back of increasing focus on environment and resource recovery. With the theme shifting from linear economy to circular economy, private sector's role becomes more important in bringing investments for technology innovations in waste treatment, efficient operation and maintenance of waste processing plants and proper recycling of waste for further use in other industries. The PPP experience in the waste-to-energy sector is limited and evolving. The sector requires a combination of preferential tariff as well as tipping fee for its success.

Future outlook

- India currently generates 62 mt of municipal waste annually. This is expected to more than double by 2030 with the urban population also becoming double its size now. This will continue to unlock new business opportunities for stakeholders across the board.
- The government too is making concerted efforts to improve waste management practices through flagship schemes such as the Swachh Bharat Mission and the Smart Cities Mission. In the past one to two years, there have been some visible improvements in MSW management at the city-level, in terms of projects undertaken, capacity addition, and technologies and best practices adopted.
- Further, the capabilities of ULBs in segregating, recycling and reusing waste have been strengthened. Steps to promote bio-degradable and recyclable substitutes for non-biodegradable materials have been taken. ULBs are recognising and practising reduce-reuse-recycle (3R) or reduce-reuse-recycle-replace (4R) concepts.
- The emphasis on scientific disposal has also increased. There are still a large number of utilities that continue to follow outdated management and service delivery processes. Thus, the investment requirement is huge and the sector presents sizeable opportunities. As business imperatives change, newer technologies and applications will be required to cater to the future demand. Also, inherent challenges such as the absence of data, inefficiencies in user charges and poor financial health of ULBs will need proactive attention.

MSW GENERATION SECTION I: MARKET ANALYSIS, OUTLOOK AND OPPORTUNITIES

1. Size and Growth

- ❖ MSW Landscape
- ❖ MSW Generation and Growth in the Past Five Years
- ❖ Institutional Framework
- ❖ Policy and Regulatory Framework
- ❖ Key Trends
- ❖ Government Initiatives
- ❖ Risks and Challenges
- ❖ Challenges that are Potential Opportunities
- ❖ Future Outlook and Projections

2. Recent Initiatives and Key Developments

- ❖ Recent Policy and Regulatory Developments
- ❖ Project Completions
- ❖ Recent Contract Awards
- ❖ Projects Approved/Launched/Proposed
- ❖ City-Level Smart Waste Management Initiatives
- ❖ Other Key Developments

3. Project Pipeline and Analysis

- ❖ Overall Project Analysis (Announced, Approved and Under Bidding)
- ❖ By State
- ❖ By Stage of Development
- ❖ By Ownership
- ❖ By Completion Period
- ❖ Expected Capacity Addition
- ❖ Capacity Addition in Near Term (Based on On-going Projects)
- ❖ Top Cities to Invest In

4. Sector Outlook and Market Opportunities

- ❖ Key Growth Drivers
- ❖ Potential Challenges
- ❖ Investment Requirements
- ❖ Market Opportunities
- ❖ Key Projections

5. Key Government Programmes: Progress So Far, Upcoming Projects and Opportunities

- ❖ Swachh Bharat Mission
- ❖ Namami Gange Programme
- ❖ Smart Cities Mission

6. Inter-City Comparison: Infrastructure Growth Plans and Projections

- ❖ City-wise Analysis under SBM(U)
- ❖ Analysis of MSW Generation Across Key Cities
- ❖ Current MSW Management Infrastructure
- ❖ Profiles of Key Cities
- ❖ Other Cities
- ❖ Current Treatment Technology
- ❖ Innovations and Advancements
- ❖ 3R Initiatives
- ❖ Capacity Addition Plan

7. Profiles of Key Upcoming Projects

- ❖ Integrated Solid Waste Management Project in Ambala-Karnal Cluster
- ❖ Deonar Waste-to-Energy Plant
- ❖ Mulund Dumpsite Reclamation Project
- ❖ Integrated Solid Waste Management Project in Fatehabad-Bhuna Cluster
- ❖ Integrated Solid Waste Management Project for Punhana Cluster
- ❖ Chennai Solid Waste Management Project (Two Packages)
- ❖ Ghazipur Integrated Waste to Energy Project
- ❖ Ghazipur Waste to Energy Project
- ❖ Galand Waste to Energy Project
- ❖ Tumsar Integrated Waste Management Project
- ❖ Kodungaiyur and Perungudi Waste to Energy Projects
- ❖ North Delhi Integrated Solid Waste Management Project
- ❖ GMADA - Patiala Cluster Municipal Solid Waste Management Project
- ❖ Adityapur Integrated Solid Waste Management Project
- ❖ Bairiya Waste-to-Energy Project
- ❖ Haryana Solid Waste Management Project
- ❖ Tamil Nadu Comprehensive Solid Waste Management Project
- ❖ Pachchanady Solid Waste Management Plant Upgradation Project

- ❖ Bainguinim Integrated Municipal Solid Waste Management Project
- ❖ Tehkhand Waste to Energy Project
- ❖ Meerut Solid Waste Management Project
- ❖ Adampur Chhavani Waste to Energy Project
- ❖ Dehradun Waste to Energy Project
- ❖ Thane Waste to Energy Project
- ❖ Gangtok Waste Processing Plant Project
- ❖ Chas Solid Waste Management Project
- ❖ Kollam Integrated Solid Waste Management Project (Kureepuzha)
- ❖ Kozhikode Cluster Waste to Energy Plant Project
- ❖ Kota Solid Waste Management Project
- ❖ Sahebganj and Rajmahal Integrated SWM Project
- ❖ Lohardaga Integrated Solid Waste Management Project
- ❖ Munnar Waste to Energy Project
- ❖ Panchkula Cluster Solid Waste Management Project
- ❖ Timarpur Okhla Waste to Energy Expansion Project
- ❖ Kuberpur Waste to Energy Project
- ❖ Nagpur Solid Waste Management Project
- ❖ Ludhiana Integrated Municipal Solid Waste Management Project
- ❖ Guntur Waste to Energy Project
- ❖ Rohtak Integrated Solid Waste Management Project
- ❖ Mucherla Waste to Energy Project
- ❖ Kapulupada Waste to Energy Project
- ❖ Hadapsar Solid Waste Management Project
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- ❖ Badarpur Waste to Energy Project

8. Costs, Revenues and Financing

- ❖ Key Financing Sources
- ❖ Capex and Opex Requirements
- ❖ Revenue Sources and Resource Recovery
- ❖ Project IRRs
- ❖ Market for Residues
- ❖ Recent PE Deals
- ❖ Investment Requirements
- ❖ Business Risks and Challenges

9. Focus on PPP: Experience and Future Opportunities

- ❖ Formats and Models
- ❖ Experience So Far
- ❖ Case Studies
- ❖ Different Revenue Streams
- ❖ PPP Project Portfolio
 - Key Completed Projects
 - Key Ongoing Projects
- ❖ Key Success Factors and Learning
- ❖ PPP Potential and Outlook

10. Key Private Players

- ❖ Industry Structure
- ❖ Contracting Practices and Experience
- ❖ Key Players
- ❖ Project Portfolio
- ❖ Financial Performance
- ❖ Key Industry Concerns

SECTION II: FOCUS ON MSW MANAGEMENT INFRASTRUCTURE: CURRENT STATE, TECHNOLOGY DEPLOYMENT AND FUTURE REQUIREMENTS

11. Collection and Transportation

- ❖ Current Practices
- ❖ Expenditure on Solid Waste Management
- ❖ Swachh Survekshan 2019
- ❖ Type of Transportation Infrastructure Deployed (e-rickshaws, carts, trucks, etc.)
- ❖ Smart Initiatives at the City Level
- ❖ New Trends and Advancements
- ❖ Investment Requirements
- ❖ Issues and Concerns

12. Treatment and Disposal

- ❖ Status of Waste Processing
- ❖ Relevant Treatment Technologies
- ❖ Disposal Practices (Land filling, 3R, etc.)
- ❖ Smart Initiatives at the City Level
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- ❖ Existing Capacity
- ❖ Relevant Treatment Technologies
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- ❖ Market Potential
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- ❖ Growth Drivers for BioFuels
- ❖ Completed WIE Projects
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14. Integrated Solid Waste Management

- ❖ ISWM
- ❖ Salient Features
- ❖ Experience So far
- ❖ Government Initiatives
- ❖ Key City Level Initiatives
- ❖ Upcoming Projects
- ❖ Benefits
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- ❖ Recommendations

SECTION III: TECHNOLOGY AND EQUIPMENT

15. O&M and Asset Management Technologies

- ❖ Current O&M Practices
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- ❖ Current City-Level Practices
- ❖ Role of Private Players
- ❖ Technology Trends and Advancements
- ❖ Planned ULB Initiatives
- ❖ Segment outlook

16. Emerging Equipment Requirements

- ❖ Equipment Market Size and Growth
- ❖ Equipment Requirement
- ❖ Key Players
- ❖ Innovations and Advancements
- ❖ Future Demand Projections

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GST @ 18%	Rs 20,250
Total	<input type="checkbox"/> Rs 1,32,750
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Municipal Solid Waste in India 2019	
Site Licence (Single Location)	Rs 75,000
GST @ 18%	Rs 13,500
Total	<input type="checkbox"/> Rs 88,500
<hr/>	
Enterprise Licence (Multiple Locations)	Rs 1,12,500
GST @ 18%	Rs 20,250
Total	<input type="checkbox"/> Rs 1,32,750
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Sewage Treatment Market in India 2019 + Municipal Solid Waste in India 2019 (10% discount on combined purchase)	
Site Licence (Single Location)	Rs 1,35,000
GST (18%)	Rs 24,300
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