

SNAPSHOT

WASTE MANAGEMENT IN INDIA



This report is derived from an extensive secondary literature survey of the (solid) waste management sector in India. The primary aim of the report is to set the context for understanding the current state and future evolution of the sector in the country. Briefly, the policy framework and institutional structure as well as the challenges and opportunities within the sectors are delineated.

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Waste in Urbanizing India

- *Over 160,000 Metric Tons (MT) of municipal solid waste is generated daily in the country. Per capita waste generation in cities varies from 0.2 kg to 0.6 kg per day depending upon the size of population. This is estimated to increase at 1.33% annually.*
- *The total waste quantity generated by the year 2047 is estimated to be about 260 million tons per year. It is estimated that if the waste is not disposed off in a more systematic manner, more than 1,400 km² of land, which is equivalent to the size of city of Delhi, would be required in the country by the year 2047 for its disposal.*
- *The Indian industrial sector generates an estimated 100 million tons/year of non-hazardous solid wastes, with coal ash from thermal power stations accounting for more than 70 million tons/year.*
- *Over 8 million tons/year of hazardous waste is generated in India. About 60% of these wastes, i.e., 4.8 million tons/year is estimated to be recyclable and the remaining 3.2 million tons/year is non-recyclable.*

Background ↙

India's growth story, especially in the last few decades has also resulted in a rapid increase in both domestic and industrial waste.

- The main driver for domestic waste is the rapid urbanisation that is slated to change India from a largely rural to a majority urban country in the next decade (2020). In contrast rural waste is largely agricultural in nature and is dispersed over half-a-million habitations making them 'manageable'. However, rural areas do suffer as 'pollution sinks' for the encroaching urban sprawl.
- The rapid growth of the Indian industry has led to increased industrial waste generation. Coal ash from thermal power stations accounts for more than 70% of all industrial waste.

Solid waste management (SWM) has three basic components, namely, collection, transportation and disposal. The objective of SWM is to reduce the quantity of solid waste disposed off on land by recovery of materials and energy from solid waste in a cost effective and environment friendly manner.

Lack of financial resources, institutional weaknesses, improper choice of technology and public apathy towards waste has made the prevalent system of waste management far from satisfactory. For instance, the practice of uncontrolled dumping of waste on the outskirts of towns and cities have created serious environmental and public health problems that threaten water quality and urbanisation itself.

This unsatisfactory state of affairs is mirrored even in the industrial (hazardous) sector, where the challenges are steeper in terms of treatment and disposal of hazardous waste. Waste is predominantly disposed off in landfills, and partly by incineration. 3R (reduce, reuse, recycle) is seldom used in practice, despite being part of the policy envelope for a while.



Therefore, authorities face the challenge of reinforcing their available infrastructure for efficient waste management and ensuring a scientific disposal of the wastes. The key will be to start looking at means and technologies to recover resources from waste management.

Market Assessment

Estimates of the municipal¹ and hazardous² waste market were above €1.5 billion and around €171 million respectively. In light of India’s economic dynamism in the interregnum, the combined market must now be over €3.7 billion (apart from nuclear waste management that is not in the purview of SWM)

There is an increasing presence of the private sector in the SWM particularly for door-to door collection of solid waste, street sweeping in a limited way, secondary storage and transportation and for treatment and disposal of waste. Cities which have pioneered in public private partnerships (PPPs) in SWM include Bangalore, Chennai, Hyderabad, Ahmadabad, Surat, Guwahati, Mumbai, Jaipur and more.

The Government of India at the central level, has funded various initiatives to address SWM by providing assistance to the tune of €372.3 million under 12th Finance Commission (€329.4 million under the 11th Finance Commission).

Policy and Regulatory Framework

The Ministry of Environment and Forests (MoEF) and the pollution control boards: Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) together form the regulatory and administrative core of the sector.



1. US Commercial Service 2004
2. US Commercial Service 2006



As SWM is part of public health and sanitation - according to the Indian Constitution - it falls under the state list. As this activity is of local nature, it is entrusted to the Urban Local Bodies (ULBs). The management of municipal solid waste is one of the most important obligatory functions of the urban local bodies.

Legislation

Under the Environmental Protection Act (EPA) 1986, MoEF has issued several notifications to tackle the problem of hazardous waste management. These include:

- Municipal Wastes (Management and Handling) Rules, 2000, whose aim was to enable municipalities to dispose municipal solid waste in a scientific manner.
- Hazardous Wastes (Management and Handling) Rules, 1989, which brought out a guide for manufacture, storage and import of hazardous chemicals and for management of hazardous wastes.
- Biomedical Waste (Management and Handling) Rules, 1998, were formulated along parallel lines, for proper disposal, segregation, transport etc. of infectious wastes.
- Hazardous Wastes (Management and Handling) Amendment Rules, 2000, a recent notification issued with the view to providing guidelines for the import and export of hazardous waste in the country.

Although nearly a decade has lapsed since the time limit for implementation of the rules ran out in December 2003, yet there are cities which have not initiated any measures at all. Given the lack of in-house capability of municipal authorities and paucity of resources, there have been successful attempts to outsource certain services and resort to private sector/NGO participation in providing SWM services such as door-to door collection, street sweeping, secondary collection of waste, transportation of waste, composting of waste and power generation from waste and final disposal of waste at the engineered landfill.

However, the present capacity of municipalities in India to manage the privatization process is quite limited. There is need for developing in-house financial and managerial capability to award contracts to private sector and monitoring services provided by the private operator since the onus of ensuring proper service delivery and compliance of standards lies with the local bodies.

The Key Drivers for Sector Growth

- Progressively stricter norms for the sector (especially for industrial and hazardous wastes).
- Public interest litigations and the rulings of the courts (Supreme Court) for domestic wastes.
- Scarcer (and further) landfill space is forcing the authorities to use appropriate technologies and better management.
- Grant components for SWM in Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT).

Indicative Opportunity Spaces

Solid waste sector offers many possibilities to foreign companies with low-cost technologies, products or services. There is an urgent need in most cities to change, restructure or intensify the waste collection systems. There is a need for promoting new ideas and concepts of SWM in waste collection, segregation and waste transportation. This concerns hazardous waste and biomedical waste, too.

Due to the lack of capital, so far low-cost treatment technologies, such as “dumpsite treatment” (if any treatment at all), and composting technologies have been used. The role of waste recovery and recycling has not been essential, because rag pickers have taken care of valuables and recyclables. The lack of land and increasing waste quantities require new technologies, which are applicable for mixed SWM and competitive. It is quite probable that outdoor composting will increase its role in the future, in case, reasonable use can be found for the compost end-product. The prospects for anaerobic digestion (or for anaerobic composting as called in India) are also promising but are highly dependent on the reasonable utilization of heat energy.

Some opportunity spaces are outlined below:

- Joint ventures with Indian firms to offer integrated solutions in waste treatment, including performing feasibility studies, designing, technical consulting and providing operation and online maintenance services.
- There is a demand for technologies and services for effective waste collection, transportation and disposal, and its treatment and recycling.
- Engineering and consulting services on waste collection and transportation, landfill treatment, waste treatment plants, outdoor

Barriers to private sector participation

- *Financial status of ULBs is precarious and is perceived as very high-risk.*
- *Institutional complexity due to multiplicity of agencies involved in service delivery.*
- *Lack of regulatory or policy enabling framework for PPPs.*
- *Few bankable and financially sustainable projects considering the opportunities and risks involved.*
- *Rationalize tariff and user charges.*



compositing, anaerobic digestion of waste and sewage sludge, biological-mechanical waste treatment and waste to energy.

- 3R technologies and solutions for high polluting sectors, such as thermal power stations, chemical and pharmaceutical industries
- Design, manufacture and installation of various types of waste management systems

Fiscal Incentives:

1. Tax Holiday: A 10 year, 100% deduction of profits and gains is available for companies operating in waste projects.
2. Tax / Duties Relief:
 - Direct taxes: 100% depreciation within 1st year of project installation.
 - Exemption / reduction in excise duty.
 - Exemption from Central Sales Tax, and customs duty concessions on the import of material, components and equipment used in "Renewable Energy" RE projects.
 - Duty-free import of renewable energy equipment.
 - Exemptions from electricity taxes.

Government Initiatives:

1. For initiating SWM programs government's JNNURM program to fund cities for developing urban infrastructure and services.
2. During the year 2011-12 Ministry of New and Renewable Energy is implementing a programme on Energy Recovery from Municipal Solid Waste (MSW). The scheme provides financial assistance for setting up of five Pilot projects for power generation from MSW. Financial assistance at a flat rate of Rs. 2 crore per MW, subject to ceiling of 20% of project cost and Rs. 10 crore per project, whichever is less.

PPP Models in SWM	
1. Collection, Transportation & Cleaning	Management contract / BOOT
2. Development of Transfer Station/ MRTS & Transportation	BOOT / DBFOT
3. Waste Processing facility	BOOT/DBFOT/BOO
4. Development of Sanitary Landfill & Post Closure Maintenance	Management contract / DBFOT
5. Integrated MSWM system (with combination of above)	Mostly on BOOT

Sources

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5. *Waste Generation Scenario in India*, <http://www.ciiwasteexchange.org>

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