

# A REVIEW ON SOLID WASTE MANAGEMENT INITIATIVES IN THE LIGHT OF THE SWACHH BHARAT ABHIYAN

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## ABSTRACT

*Swachh Bharat Abhiyan flagged in 2014 is a significant program of the Modi Government aiming for a cleaner and more welcoming India. SBA aims to attain cleanliness, hygiene, and improvement in rural areas' general quality of life. Solid and Liquid waste management is the key component of this Abhiyan. Urbanization creates its by-product in the form of Solid Waste and it affects biodiversity. Improper disposal of Solid Waste affects both the land and the people living on it. This paper focuses on the initiatives of various sectors involved in waste management for the well-being of biodiversity. This paper is based on secondary research. The paper highlights the action taken by the government, NGOs, Corporates, and local bodies for Solid Waste Management. Published reports related to waste management by government agencies, consultants, and other key agencies involved in the process. The paper reviews the reports to find suggestions to improve the current situation and suggest future strategies to reduce solid waste. This paper can help decision-makers, City Planners, Municipal Corporations, Corporates, and researchers to create a more efficient plan for Solid Waste Management. With SBA there is a paradigm shift in SWM. This study reviews the status quo and sustainability of the activities carried out under SBA and suggests several areas for improving the program within the SBA for effective SWM in India. The paper review is an umbrella review covering reviews on SWM and SBA to explore the current situation and the gaps still left.*

**Key Words:** *Solid Waste Management, Swachh Bharat Abhiyan, Cleanliness, Hygiene*

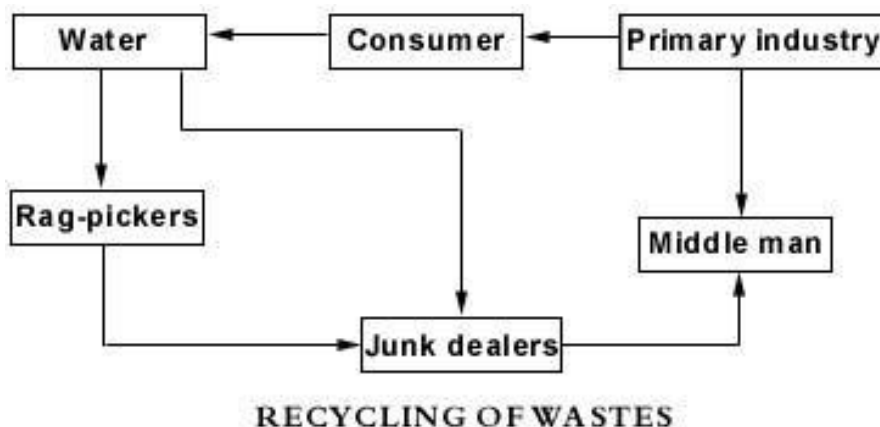
## INTRODUCTION

Solid Waste Management has emerged as one of India's most challenging developmental issues. Urban local bodies are responsible for maintaining cities and towns clean, according to the 12<sup>th</sup> Schedule of the 74<sup>th</sup> Constitution Amendment Act of 1992. (Singh, 2020) Statistically, urban India produced around 62 Mt of solid waste (450 g/capita/day) in 2015. Approximately 82% of MSW was collected and the remaining 18% was litter. The waste treated was only 28% of the collected waste, and the remaining 72% was openly dumped. (Sharma, 2019) Waste collection efficiency ranges between 70% and 95% in major metropolitan cities, whereas it is below 50% in several smaller cities. Most urban local bodies (ULBs) are unable to manage such a large amount of solid waste due to financial debilities and inadequate infrastructure. Source segregation of waste, doorstep collection, options for recycling and reuse, technologies for treatment, land availability, and disposal competence are a few of the prime challenges.

Type of MSW	Composition of waste	Sources
Biodegradable waste or organic waste	Food and kitchen waste, fruit and vegetable peels, green waste, yard waste (like garden trimming), wood, animal wastes, paper, rubber, and leather	Household and kitchen, food processing industries, farms
Recyclable waste	Paper, cardboard, glass, bottles and jars, tin cans, aluminium cans, aluminium foil, metals, certain plastics, fabrics, clothes, tires, and textile	Office, shops, scraps yards, car and automobile industries, textile industries
Inert waste	Construction and demolition waste, dirt, rocks, debris, sands	Constructional sites, demolished buildings
Hazardous waste	Most paints, chemicals, tires, batteries, light bulbs, electrical appliances, Fluorescent lamps, aerosol spray cans, and fertilizers	Household, paint industries, chemical industries
Toxic waste	Including pesticides, herbicides, and fungicides	Chemical industries, various pesticide and herbicide manufacturing industries

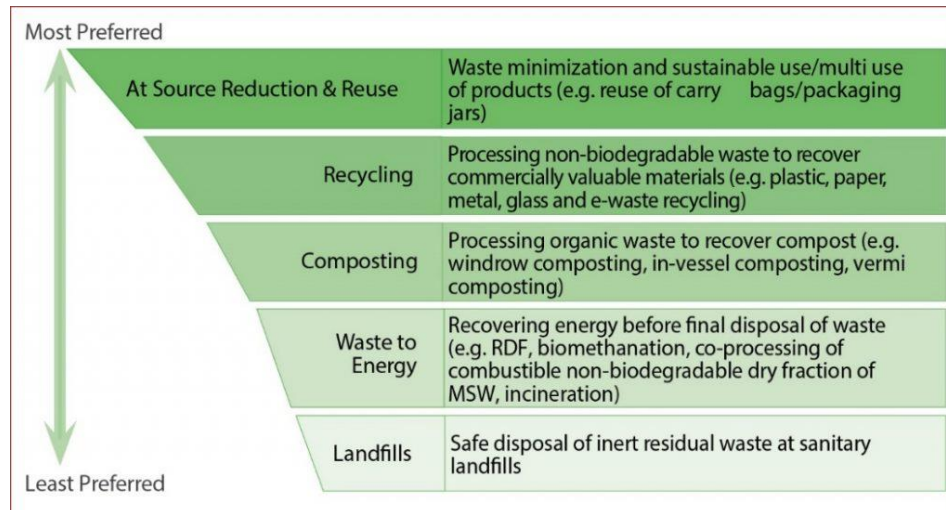
The type of litter we generate and the approximate time it takes to degenerate	
Type of litter	The approximate time it takes to degenerate the litter
Organic waste such as vegetable and fruit peels, leftover foodstuff, etc.	a week or two.
Paper	10-30 days
Cotton cloth	2-5 months
Wood	10-15 years
Woollen items	1 year
Tin, aluminium, and other metal items such as cans	100-500 years
Plastic bags	one million years?
Glass bottles	undetermined

Source: <http://edugreen.teri.res.in>



Source: CPCB Report on Management of Municipal Solid Waste

**Hierarchy of Waste Management:** The hierarchy of waste management is most often used and reused as Environmentally Friendly. Source reduction Waste reduction and reuse of materials to prevent them from entering the waste stream.(Bhada, 2019)



Source: Ministry of Urban Development, Municipal Solid Waste Management Manual-Part II, Central Public Health and Environment Engineering Organization, 2016, p. 6.

## THE PRESENT SCENARIO

With the growing population, the waste generated rate is also increasing rapidly. Over 9,500 tons per day (TPD) of waste is generated per day in the town. About 8,000 TPD of waste is collected and transported to three main landfill sites. Urban solid waste is a complex mixture of waste generated in households, constructions, commercial, industrial elements, and hospital waste. An analysis of the waste physical revealed that it consists of about 32% compostable matter and recyclable components which include paper, plastics, and metals are about 6.6%, 1.5%, and 2.5% respectively. (Sharholy, 2008)

The Rapid increase in the waste generation and failure in its management was also raised by the Union Minister of State for Environment Ashwini Kumar Choubey said in the year 2019-20 in which stated that India generated an annual waste of 34,69,780 tonnes of waste while in 2018-19 it was 33,60,043 tonnes and in 2017-18 it was 23.83.469 tonnes.(Joshi & Ahmed, 2016)

The MoEF issued MSW (Management and Handling) Rules 2000 to ensure proper waste management in India and newly updated draft rules have recently been published. Municipal authorities are responsible for implementing these rules and developing infrastructure for the collection, storage, segregation, transportation, processing, and disposal of MSW. Chandigarh is the first city to develop SWM in a planned way and has improved waste management compared with other Indian cities. (Sandhu, 2020)

## ROLE OF THE INFORMAL SECTOR IN WASTE MATERIALS REUSE AND RECYCLING

The informal sector has a very important role in India and this must be integrated into formal SWM systems. (M.Snel, 1999) The informal sector is characterized by small-scale, labour-intensive, largely unregulated, and unregistered low-technology manufacturing or provision of materials and services. Waste pickers collect household or commercial/industrial waste and many hundreds of thousands of waste pickers in India depend on waste for an income, despite the associated health and social issues. (Wilson, Velis, & Cheeseman, 2006) Pickers extract potential value from waste bins, trucks, streets, waterways, and dumpsites. Some work in recycling plants owned by cooperatives or waste picker associations. Waste picking is often the only source of income for families, providing a livelihood for significant numbers of urban poor and usable materials to other enterprises. Waste pickers in Pune collect organic waste for composting and biogas generation. Waste pickers also make a significant contribution by keeping cities clean. A recent study of six Indian cities found that waste pickers recovered approximately 20% of waste, with 80 000 people involved in recycling approximately three million tonnes. It is estimated that every tonne of recyclable material collected saved the ULB approximately INR 24 500 per annum and avoided the emission of 721 kg CO<sub>2</sub> per annum. (Kumar, Smith, Fowler, & Velis, 2017)

**Waste collection and transport** Waste collection, storage, and transport are essential elements of any SWM system and can be major challenges in cities. Waste collection is the responsibility of the municipal corporations in India, and bins are normally provided for biodegradable and inert waste. (Joshi & Ahmed, 2016) Mixed biodegradable and inert waste are often dumped, with open burning a common practice. Improvements to waste collection and transport infrastructure in India will create jobs, improve public health and increase tourism. Local bodies spend around Rs. 500–1000 per tonne on SWM with 70% of this amount spent on collection and 20% spent on transport. (Kumar, Smith, Fowler, & Velis, 2017)

**Waste disposal** SWM disposal is at a critical stage of development in India. There is a need to develop facilities to treat and dispose of increasing amounts of MSW (Bhada, 2019). More than 90% of waste in India is believed to be dumped in an unsatisfactory manner. It is estimated that approximately 1400 km<sup>2</sup> was occupied by waste dumps in 1997 and this is expected to increase in the future. Properly engineered waste disposal protects public health and preserves key environmental resources such as groundwater, surface water, soil fertility, and air quality.

**Environmental and health impacts of waste dumping** Waste dumps have adverse impacts on the environment and public health. Open dumps release methane from the decomposition of biodegradable waste under anaerobic conditions. Methane causes fires and explosions and is a major contributor to global warming. There are also problems associated with odour and migration of leachates to receiving waters. Odour is a serious problem, particularly during the summer when average temperatures in India can exceed 45°C. Discarded tires at dumps collect water, allowing mosquitoes to breed, increasing the risk of diseases such as malaria, dengue, and West Nile fever. Uncontrolled burning of waste at dumpsites releases fine particles which are a major cause of

respiratory disease and cause smog. Open burning of MSW and tyres emits 22 000 tonnes of pollutants into the atmosphere around Mumbai every year. The impacts of poor waste management on public health are well documented, with increased incidences of nose and throat infections, breathing difficulties, inflammation, bacterial infections, anaemia, reduced immunity, allergies, asthma, and other infections.

## **POLICIES AND AGENCIES/ORGANISATIONS INVOLVED IN WASTEMANAGEMENT**

### **Swachh Bharat Abhiyan (SBA, 2014)**

The mission was launched on October 2, 2014, in Raj Ghat, New Delhi to make India clean. Mission objectives include eradicating open defecation, eliminating manual scavenging, and modern and scientific municipal solid waste management, aiming to induce a change in behavior related to practicing healthy hygiene.(Ghosh, 2016). SBA was more focused on changing the mindset and developing hygiene practices amongst the Indian population. (De L. S., 2016) It is a national campaign covering 4041 statutory towns with objectives to ensure door-to-door garbage collection and proper disposal of MSW in urban areas by 2019. The SBA had given greater emphasis to scientific MSWM at all levels with scope for modern technological intervention, which is considered to bring a paradigm shift in the Indian MSWM movement. (Ghosh, 2016) Solid Waste Management Rule 2016 keeping the objective of SBA, the new waste management act “Solid Waste Management Rules, 2016” was implemented. This act was formulated based on learnings from 14 years’ experience gained post notification of the MSW rules in 2000.(Chandran, Narayanan, & Subramaniam, 2019). SBA aimed to bring about improvement in the general quality of life of rural people by promoting cleanliness, and hygiene and eliminating open defecation. To achieve sanitation coverage in rural areas Panchayats and rural communities were motivated to adopt sustainable sanitary practices. Cost-effective and technology-based ecologically safe and sustainable sanitation practices were promoted under SBA.(De L. S., 2016).

### **SWACHH BHARAT ABHIYAN’S PRESENT STATUS**

The 2011 Census showed that over half the country had no toilet and the share of households without toilets had decreased by just 10 percentage points in a high-growth decade (2001-2011). According to the report published in the Economic times, old habits amongst people still persist, when a team of economists visited families in rural north India from 2014 to 2018, they found that 74% of people in 2014 defecated in the open and later it reduced to 44%. And 37% of people having toilets in 2011 increased to 71% of people having toilets. Then the condition persists, and people are defecating in open.(Rukmini & Gupta, 2019). In urban areas, SBA focused on constructing individual toilets, community toilets, and Solid waste management. The adopted approach for the rural area percolated to the Gram Panchayat level and encompasses the implementation of strategies, behavioural change, and delivery mechanisms. The States were provided latitude in designing the delivery mechanisms depending on local sensibilities and demands. Currently, the

city of Mysore in Karnataka topped the Swachh Bharat rankings, in a survey conducted among 476 cities in the nation, with minimal open defecation and an extensive SWM system. Overall, four cities from the state figured in the top 10 ranked cities with Bengaluru leading the list of capital cities at the 7th rank. Overall, Southern states lead the charts with 39 cities in the top 100 followed by 27 from the East, 15 from the West, 12 from the North, and 7 from the North-Eastern States. The bottom 100 cities comprised 74 cities from the North and 21 from the East.

## **BARRIERS AND CHALLENGES TO IMPROVE WASTE MANAGEMENT IN INDIA**

- Lack of strategic MSW plans.
- Limited environmental awareness.
- Public attitudes to waste, are also a major barrier.
- Awareness to enhance segregation
- Characterization of municipal solid waste.
- Involvement of organized sector
- Urbanization and lack of appropriate level funding

## **PROBLEMS CURRENTLY FACED**

- **Landfilling:** In many metropolitan cities, open, uncontrolled and poorly managed dumping is commonly practiced, giving rise to serious environmental degradation.
- **Lack Of Prediction:** Dynamic economic growth in Indian cities leads to migration and haphazard urbanization and inefficient planning.
- **Efficient Collection:** implementation of EPR missing in India and Ineffective implementation of legislation resulting in increasing waste volume and changes in the composition of the MSW day by day.

## **SUGGESTIONS**

1. Building awareness in public at large about the cleanliness of houses/premises
2. Display of message of cleanliness through signboards at public places/markets.
3. Organizing “Prabhat Pheries various society/mohallas to create awareness
4. Repair, maintenance, cleaning & sanitization of Public/ Community toilets.
5. Cleaning bus stops / streets / streets / parks / markets / public places / sidewalk areas / backyards / front yards / areas around the station
6. Clean up waste by the river / Talab
7. Sanitize toilets in government buildings/hospitals/schools
8. Remove debris and garbage piles in public places.

9. Cleaning government buildings, including removing excess furniture/files/corridors
10. Commit not to throw it into the street but implement and develop garbage collection, not spitting indiscriminately
11. Raise students' awareness of the importance of hygiene through the distribution of instructional materials.
12. Mohalla Sabha organization where the address on this matter can be said by a famous person

## CONCLUSION

Solid Waste Management and Swachh Bharat Abhiyan are two sides of a coin. This people-centric Abhiyan is dependent on the implementation of the laid down procedures, and regular monitoring. And based on gaps found, from the monitoring results, there still exists room for improvement, and the formulation of strategies and actions should be in line with it. The SBA in its current form is only limited to toilet construction all over India. But its usage is still a big challenge for the country because of logistical and social reasons. To improve the outreach of SBA and for efficient SWM it's important to spread awareness regarding hygiene practices and their effect on health. Indian population is still not in practice separating waste and also is not conscious about their disposal. People should be made aware of recycling or reusing waste to reduce solid waste. Appropriate planning & implementation is crucial for maintaining sustainable development.

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