

**CHAPTER - III
PLANNING AND
STRATEGY OF SOLID
WASTE
MANAGEMENT**

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3.1 Planning

The framework for administration and management of SWM in India is broadly divided into three tiers - Central, State and local bodies. Other stakeholders that play a crucial role are households, businesses, industries, informal sector, non-governmental organisations (NGOs), Community Based Organisations (CBOs), Self-Help Groups (SHGs), *etc.* Involvement of all these stakeholders is necessary at several stages of SWM. The role and responsibilities of stakeholders involved in process of SWM in urban areas are given in Table-3.1 below.

Table-3.1: Responsibilities of stakeholders involved in process of SWM

Institution/stakeholders	Role and responsibilities in SWM
Central Government (MoEFCC, MoUD and CPCB)	Framing of Laws and Rules; Policies and Norms; Guidelines; Manuals; and technical assistance; financial support; Monitoring the implementation of laws and rules.
State Government (H&UDD headed by Pr. Secretary and SPCB headed by Member Secretary)	Policy framing, monitoring implementation of laws and rules in metropolitan cities; State Policy and SWM strategy; Guidelines, Manuals, and technical Assistance; financial Support; reporting on SLBs to the MoUD; capacity Building of local bodies; granting consent to set up treatment and disposal activities.
District Collector or Deputy Commissioner (DC) assisted by Project Director, District Urban Development Agency (DUDA)	Review the performance of ULBs on waste management process; facilitate identification and allotment of suitable land for solid waste processing and disposal facilities.
ULBs (headed by Commissioner, Municipal Commissioner or Chief Executive Officers/ Executive Officers)	Implementation of MSW Rules, providing SWM services; preparation of SWM plan; framing by-laws; levy and collection of fees; financing SWM system; creating public awareness; and involvement of informal sector in SWM.
Informal Sector (waste recyclers, NGOs, CBOs and private partners)	Resource recovery and recycling at different stages; providing support to the local recycling industry; involvement of community; creating awareness; collection and transportation of waste; and technology providers.

(Source: As per MSW Manual 2016)

3.2 State Policy and strategy on integrated solid waste management

MSW Manual 2000 (Section 25.2) read with Clause 11(a) (b) of SWM Rules 2016 (notified on 08 April 2016) stipulated that the State Government should prepare a State Policy and strategy on SWM within one year of notification of the Rules.

Audit observed that H&UD Department had not notified a State Policy for integrated SWM as of February 2022. In absence of the State Policy, no long-term and short-term management strategy and action plan was developed. As such, the waste generated was disposed to landfill sites without processing by the ULBs as of March 2020.

Government of Odisha issued (July 2019) a Standard Operating Procedure (SOP) creation of Micro Composting Centres (MCC) and Material Recovery

Facility (MRF)) for decentralisation of SWM system in the State and issued another SOP for operation and maintenance of MCC and MRF centers in December 2020. After introduction of above two SOPs, ULBs initiated action for creation of infrastructure of MCC and MRF. Out of 271 MCC and 173 MRF to be constructed in 114 ULBs, 165 MCC and 140 MRF centres were completed as of March 2021. In test checked ULBs, 55 out of 123 MCC and 38 out of 51 MRF centres were completed.

In reply the department stated (April 2022) that Odisha Urban Sanitation Policy and Odisha Urban Sanitation strategy were notified in 2017 which covers SWM. The fact, however, remained that no integrated/exclusive State Policy and strategy for SWM have been framed.

3.3 Municipal solid waste management plan

3.3.1 Short-term and Long-term action plan

MSW Manual, 2000 (Sections 26.1 and 26.2) and Manual 2016 (Section 1.4.5, 1.4.6 and 5.4) emphasised that ULBs are to prepare a detailed SWM plan with short-term (five years) and long-term (20-25 years) action plans apart from contingency plans. The short-term plan should lead to achievement of the long-term plan. Local authorities should ensure that short-term plans aligned with the long-term planning and implementation. Contingency plans were to prepare for appropriate storage of waste, to tide over situations of non-performance of processing/treatment/disposal facilities.

Audit observed that ULBs neither prepared short-term/long-term action plans nor contingency plans during 2015-20 for adopting a systematic approach to SWM. In the absence of these plans, planning and selection of infrastructure projects in ULBs were, to a large extent, driven by perceived availability of funds rather than need-based analysis.

The Government stated (May 2022) that the H&UD department had issued a SOP 2019 for decentralised SWM processing at State level. The reply was not acceptable since the MSW manual envisages for preparation of short and long term action plan at the ULBs level.

3.3.2 Building plans without provision of SWM

As per Clause 15(ze) of SWM Rule 2016, the ULBs should ensure that provisions for setting up of centres for collection, segregation and storage of segregated wastes are incorporated in building plans while granting approval of building plans of a group housing societies or market complexes.

Audit observed that none of ULBs have ensured solid waste management provision in building plans for market complexes or for a group housing societies as of March 2021. As a result, community participation in waste management could not be ensured. The EOs of Bolangir and Baragarh have noted the audit comments for future guidance.

3.4 Non-involvement of all stakeholders in planning

Manual on SWM, 2016 (Section 1.4.4.1) provided for constitution of a core

team or advisory team (internal stakeholders) involving departments¹² concerned with SWM services for developing the SWM plan and involvement of the community (external stakeholders comprising households, informal sector, NGOs, CBOs, SHGs, women's groups, secondary school and college students *etc.*), in SWM planning and implementation.

Audit noticed that no core team or advisory team involving internal/external stakeholders was formed in any of the test checked ULBs during 2015-20. Against requirement of 1,381 *swachha sathis* and 345 *swachha* supervisors, the test checked ULBs engaged 1,083 *Swachha Sathis* (78 per cent) from SHGs groups and 173 *swachha* supervisors (50 per cent) respectively, after introduction of SOP.

The Government stated (May 2022) that WATSAN committees¹³ were constituted in each ward of the ULBs which is actively participating in the SWM process of the ULBs at the grass root level. However, the fact remained that the Government failed to constitute the mandated core/advisory team involving all internal and external stakeholders.

3.5 Non-preparation of DPRs for solid waste management

Government of India launched its flagship scheme 'Swachha Bharat Mission-Urban (SBM)' in October 2014 and SWM was one of its six components. As per Paragraph 7.2 and 7.3 of SBM Guidelines, ULBs were to prepare Detailed Project Reports (DPRs) for SWM of their city in consultation with State Government. It also stipulated that State Government may handhold ULBs in quickly preparing DPRs for SWM by shortlisting/identifying private or government agencies.

Audit observed that none of test checked ULBs had prepared DPRs for SWM. In absence of DPRs, quantum of assessment of per capita waste generation, coverage of design capacity for waste processing, contingency plan for waste management, strategy for implementation of 3R approaches, involvement of stakeholders in planning and involvement of waste pickers in waste management could not be assessed in Audit.

The Government stated (May 2022) that establishment of small scale processing centers does not require DPRs. The reply was not acceptable, as guidelines envisage that ULBs were to prepare DPRs for SWM in consultation with the State Government.

3.6 Service Level Benchmarks (SLB)

Ministry of Urban Development has set SLBs at the national level for service provision in four key sectors – water supply, sewerage, SWM and storm water management. Monitoring performance and improvements is envisaged as the goal of the Service Level benchmarking. Benchmarking should be used as a tool for undertaking objective performance analysis by ULBs to improve their activities. The benchmarking of services enables state level agencies and local

¹² i) Commissioner or Chief Executive of the ULB ii) Head of the SWM department iii) Environment engineer in the SWM department iv) Head of the town planning department v) Head of water supply, public health or sanitation and sewerage department vi) Head of the accounts department, vii) ward level official in the SWM department

¹³ WATSAN Committee: It is a ward level water and sanitation user management committee in urban areas

level service providers to initiate a process of performance monitoring and evaluation against agreed targets. The Fourteenth Finance Commission (FFC) has also endorsed the principle of benchmarking and included in SLB as one of the conditions for the allocation of performance-based grants to ULBs. MoUD defined a common minimum framework for monitoring and reporting on performance indicators, of which eight performance indicators pertained to SWM as detailed below:

Table 3.2: SLB performance indicators and benchmarks pertaining to SWM

Sl. No.	Performance indicator	Unit as percentage of	Bench mark (in per cent)
1	Household level coverage of SWM services	households and establishments covered by daily doorstep collection system	100
2	Efficiency of collection of municipal solid waste	total waste collected against waste generated within the project area	100
3	Extent of segregation of municipal solidwaste	households and establishments that segregate their waste	100
4	Extent of municipal solid waste recovered	quantum of waste collected, which is either recycled or processed	80
5	Extent of scientific disposal of municipal solid waste	waste disposed in a sanitary landfill against total quantum of waste disposed in landfills and dumpsites	100
6	Extent of cost recovery in SWM services	recovery of all operating expenses related to SWM services that the ULB is able to meet from the operating revenues of sources related exclusively to SWM	100
7	Efficiency in redressal of customer complaints	total number of SWM related complaints resolved against total number of SWM complaints received within 24 hours	80
8	Efficiency in collection of SWM user charges	current year revenues collected against total operating revenues for the corresponding period	90

(Source: MSW manual 2016)

3.6.1 Targets and achievement in test checked ULBs

Analysis of SLB declarations (2019-20) by 21 test-checked ULBs in respect of these performance indicators (except efficiency in redressal of customer complaints) showed that extent of segregation, recovery of solid waste, scientific disposal and cost recovery of solid waste in majority of the test-checked ULBs were significantly below the benchmarks as shown in Table below.

Table No.3.3: Service Level Benchmarks achievement by 21 test checked ULBs

Particular of SLB declaration in test checked ULBs	Number of ULBs (range in percentage)			
	Zero to 20	20 to 50	50 to 80	80 to 100
Extent of segregation of SWM	12	03	02	04
Extent of SWM recovered	13	03	05	0
Extent of scientific disposal of SWM	19	01	01	0
Extent of household level coverage of SWM services	06	0	06	09
Extent of cost recovery in SWM recovered	17	02	02	0
Efficiency of collection of SWM	06	0	05	10
Efficiency in collection of user charges for SWM service	16	04	01	0

(Source: As per information provided by test checked ULBs)

It can be seen from the table above that scientific disposal of solid waste was in the range of zero to 20 *per cent* in respect of 19 ULBs.

The correctness of the achievements declared by ULBs could not be verified as ULBs did not furnish any documentary evidence in support of their claims. ULBs should strive to move towards highest/preferred level of reliability. As a result, ULBs were deprived to get the performance grant of ₹333.58 crore from FFC.

The EOs of Rayagada, Jeypore, Cuttack, Bhadrak, Sambalpur, Puri and Chhatrapur ULBs stated (January/April 2021) that steps would be taken to achieve SLBs. However, the fact remains that Government suffered loss of performance grant due to non-achievement of SLBs.

3.7 Capacity building

Manual on MSW, 2000 (Section 19.1) stipulated that measures must be taken for institutional strengthening and internal capacity building so that efforts made can be sustained over a period of time and system put in place could be managed well. Clauses 11(k) and 15 (zc) of SWM Rules, 2016, required H&UDD /ULBs to arrange for capacity building of staff (including contract workers) in managing segregation and transportation or processing of waste.

Audit observed that department had not organised any capacity building training programme for sanitation workers from 2015-19. It was, however, noticed that department organised two training programmes for sanitation workers and an exposure visit during 2019-20. As such, the capacity building for institutional strengthening was deficient during 2015-19.

3.7.1 Information, Education and Communication activities

As per Section 25.4.2.12 of MSW Manual 2000, State governments may develop appropriate Information, Education and Communication (IEC) material according to local needs and take up state-wide awareness campaign and help ULBs to build public awareness in their cities and towns and promote the principle of "Reduce, Reuse and Recycle" municipal waste.

The IEC¹⁴ campaign should target households, shops, and commercial and institutional premises as well as other stakeholders such as municipal officials, elected representatives, schools, NGOs, the informal sector, media, *etc.*, to ensure their participation in managing city waste by discharging their role effectively.

Audit observed that State Government did not develop a strategy module/document for IEC activities with the objective of creating awareness among citizens, bulk waste generators and agencies involved in handling of solid waste. ULBs did not provide evidence of various IEC activities for target groups from public to municipal staff and officers including various associations from 2015-20. They claimed that IEC activities through *Swachha*

¹⁴ IEC activities as per para 15(zg) of SWM Rule 2016: i) not to litter (ii) minimise generation of waste (iii) reuse the waste to extent possible (iv) practice segregation of waste into bio-degradable, non-biodegradable, sanitary waste and domestic hazardous waste (v) practice home composting, vermin composting and bio gas generation or community participation (vi) wrap securely used sanitary waste (vii) storage of segregated waste in different bin (viii) handover segregated waste to waste pickers and (ix) pay monthly user fee or charges to waste collectors or local bodies for SWM

Sathis were conducted by encouraging waste generators to segregate waste into ‘wet and dry’, by creating awareness through banners, stickers, wall paintings, etc. The status of various modes of communication used in test-checked ULBs is given below.

Table 3.4: Modes of communication used in the 21 test-checked ULBs during 2015-20

Sl. No	Modes of communication used	Yes	No
1	Audio	16	05
2	Video	09	12
3	Mass communication	08	13
4	Wall Paintings	17	04
5	Schools	10	11
6	Hoardings	17	04
7	Street Jatras	07	14
8	Pamphlets	14	07

(Source: Records of test-checked ULBs)

It was further observed that following issues relating to IEC were not addressed:

- Domestic hazardous waste included both toxic and bio-medical wastes. However, neither State level authorities nor district/ULB level authorities notified and publicised list of domestic hazardous wastes.
- E-waste consists of different components that are both hazardous and non-hazardous. Hence, E-waste should be segregated at source and should not be mixed with solid waste. However, no specific IEC activity focused on E-waste segregation was carried out.
- None of test-checked ULBs created awareness for levy of penalty for littering, non-segregation of different waste, etc.
- IEC activities conducted by test-checked ULBs did not emphasise ‘not to burn, ‘not to bury’ and ‘not to litter’ solid waste, and did not propagate waste minimisation through 3R concept.
- None of test-checked ULBs encouraged community participation adequately.
- ULBs did not create adequate awareness amongst the work force for utilisation of protective equipment.

The Government stated (May 2022) that instructions and prototypes to ULBs for taking up IEC activities have been issued by the department from time to time. Government further stated that ward level meetings were being organised to generate awareness about sanitation. However, the fact remains that IEC activities were found deficient in effectively achieving SWM target. Further, Government did not furnish any documentary evidence in support of ward level meetings.

3.8 Generation and assessment of waste

A reliable assessment of different kinds of waste generated in the city limit is essential for planning and effective implementation of SWM. Section 3.3.6 of MSW Manual, 2000, stipulated that data on waste generation, weight and volume should be collected by each authority for application in its own area of

operation. However, Audit found the following deficiencies in assessment of waste generation.

3.8.1 Inadequate estimation of waste generated

Section 1.4.3.3.1 of Manual on SWM, 2016 stipulated that for the purpose of long term planning, average amount of waste disposed by a specific class of generators may be estimated only by averaging data from several samples. These samples are to be collected continuously for a period of seven days at multiple representative locations within jurisdiction of ULB, in each of three main season's viz., summer, winter and rainy seasons. Waste should be aggregated over seven-day period, weighed and averaged. These quantities could then be extrapolated to entire ULB and per capita generation assessed. For purposes of project identification, Section 3.3.6.2 of SWM Manual 2000 suggested municipal refuse generation rates¹⁵ where an indication of service level must be estimated and data from project preparation stage have to be developed.

Audit observed that test checked ULBs did not conduct any survey adhering to the prescribed methodology but adopted population estimation/per capita method to arrive average waste generated. Audit also found wide variation in waste generation which ranged from 0.74 to 227.07 TPD as reported by ULBs and as calculated by Audit as per norms which is detailed in **(Appendix-VI)**. Non-taking of survey for arriving at quantum and type of waste generated by various sections of society has seriously impacted proper planning and strategy selection and implementation of SWM.

The Government stated (May 2022) that a sample survey was conducted by the ULBs taking the wastes of some households of each ward for 10 days to derive the *per capita* waste generation. The reply was not acceptable since none of the test checked ULBs, nor the Government, furnished any documentary evidence to Audit for conducting sample survey to arrive at the *per capita* waste generation.

3.9 Incomplete coverage of waste generators

Section 1.4.3.3.2 of Manual on SWM, 2016 stipulated that multiple samples at multiple locations need to be taken to determine waste composition as daily, seasonal, and temporal fluctuations which are usually observed within a ULB. Hence, data on waste generation should capture all types of waste generation (including temporal fluctuations) and existing quantity of unprocessed solid waste dumped in landfill sites in and around the city.

Audit observed that none of the ULBs had prepared DPRs for generation of solid waste from public buildings such as places of public worship, industrial buildings, community centres, kalyan mandaps *etc.*, and existing quantity of unprocessed solid waste dumped in landfill sites in and around the city, but adopted population estimation/per capita method to arrive at average waste generated. Thus, waste assessment did not capture and include temporal fluctuations (festivals/functions like social, economic, religious, political, *etc.*) in generation of waste in urban limits. The database lacked complete and significant data required for waste assessment.

¹⁵ Residential refuse: 0.3 to 0.6 kg/cap/day, Commercial refuse: 0.1 to 0.2 kg/cap/day, Street sweepings: 0.05 to 0.2 kg/cap/day and Institutional refuse: 0.05 to 0.2 kg/cap/day

The Government stated (May 2022) that during sample survey various types of institutions were covered and assessment made accordingly. The reply was not acceptable since none of the test checked ULBs had conducted sample survey for waste generators and no documentary evidence was provided in this regard to Audit.

3.10 Incorrect assessment of design capacity of MCCs

The SOP (July 2019) stipulated that for assessment of design capacity for MCC, ULBs are required to conduct quantification of waste through sample survey for a duration of ten days by selecting a few households in each ward which are representative in nature. Quantity of waste generated in a city needs to be assessed to establish adequacy of existing systems and to plan for augmentation of treatment and disposal facilities. As per the SOP, an MCC with a capacity of 1.5 TPD waste is required to be established to process waste generated from a population of 10,000 that is about 2,220 households.

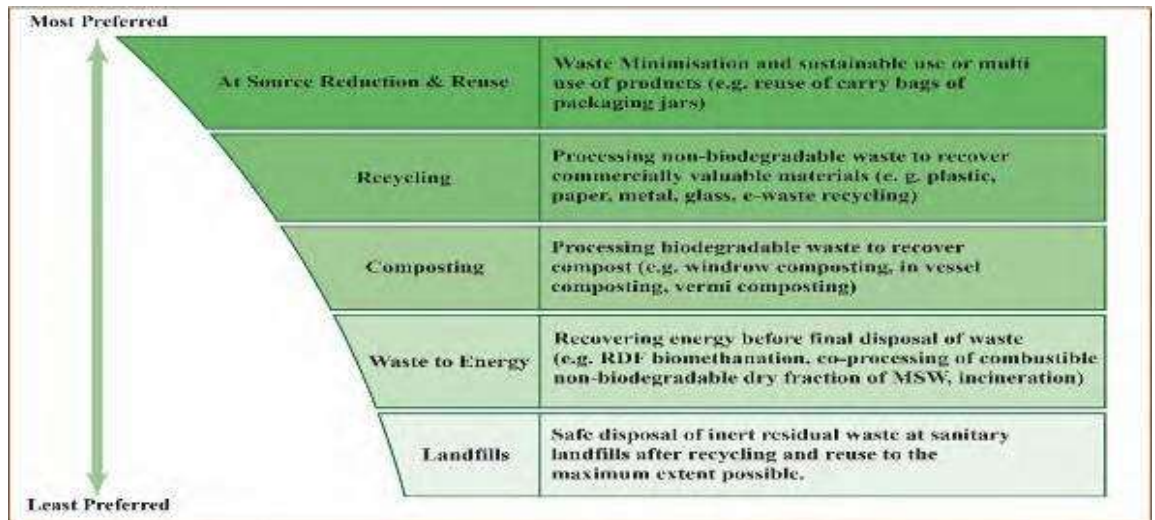
Audit observed that none of test checked ULBs had carried out mandatory survey for ten days for assessment of waste generation from selective households to assess required design capacity of MCC but adopted population estimation/per capita method to arrive at average waste generated resulting in over/under assessment of design capacity of MCC as detailed in **Appendix-VII**.

The Government stated (May 2022) that considering the households waste from each ward for 10 days, a sample survey was conducted by the ULBs. An action plan was prepared at State level on the basis of present population and waste generation for establishment of MCCs/MRFs. The reply was not acceptable since capacity of the MCCs was determined by adopting population estimation without any sample survey to arrive at average waste generated resulting in over/under assessment of design capacity of MCCs. Further no documentary evidence was furnished to Audit regarding the sample survey conducted by ULBs.

3.11 Absence of efforts for waste minimisation

MSW Manual, 2000 (Section 2.3) and 2016 (Section 2.1) prescribe a step-wise approach in order of environmental priority for different waste management options with prevention¹⁶ being most preferred option and disposal the least preferred. It is closely linked to 3R approach, which helps to reduce quantity of waste, cost associated with its handling, and its environmental impacts. The Manuals also stipulated that waste minimisation strategies require policy interventions at national, state and local level. ULBs were to play a pioneering role by reducing the amount of waste to be handled.

¹⁶ Waste prevention known as source reduction which means using less material to get a job done. Waste prevention methods help create less waste before recycling



(Source: MSW Manual, 2016)

Audit observed that GoO had not initiated any strategy/policy for prevention, minimising, reuse and recycling of waste as of March 2021 resulting in 90 *per cent* of waste being deposited at landfill / dump sites during 2015-20 without processing.

The Government stated (May 2022) that adequate processing facilities have been set up in all the ULBs in the State with meticulous planning. However, fact remained that GoO had not initiated any strategy/policy for prevention, minimising, reuse and recycling of waste during 2015-20 resulting in 90 *per cent* of waste being deposited at landfill / dump sites without processing.