



SUPREME AUDIT INSTITUTION OF INDIA
लोकहितार्थ सत्यनिष्ठा
Dedicated to Truth in Public Interest

**Report of the
Comptroller and Auditor General of India
on
Solid Waste Management in Urban Local Bodies**

**Government of Rajasthan
Report No. 4 of 2025
(Performance Audit)**

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Table of Contents		
	Reference to	
	Paragraph	Page
Preface	-	iii
Executive Summary	-	v
Chapter I: Introduction		
Solid Waste Management in Urban Local Bodies	1.1	1
Regulatory framework governing Management of Solid Waste	1.2	1
Financial Resources	1.3	3
Organisational setup	1.4	3
Audit Objectives	1.5	4
Audit Scope and methodology	1.6	4
Audit Criteria	1.7	4
Acknowledgement	1.8	5
Chapter II: Planning for Solid Waste Management		
Solid Waste Management Planning	2.1	7
Inconsistency in data of waste generated	2.2	9
Conclusion	2.3	10
Chapter III: Management of Solid Waste in ULBs		
Targets and achievements against Service Level Benchmarks	3.1	11
Status of generation, collection and processing of Solid Waste	3.2	13
Collection of Solid Waste	3.3	14
Segregation of Solid Waste	3.4	20
Processing and disposal of Solid Waste	3.5	24
Conclusion	3.6	29
Chapter IV: Monitoring and Information, Education and Communication Activities		
Monitoring in Waste Management	4.1	31
Information, Education and Communication activities	4.2	31
Conclusion	4.3	32

List of Appendices		
Appendix Number	Details	Page
Appendix - I	Position of funds received and utilized under SWM at the State level during 2017-23	35
Appendix - II	Details of SLB performance indicators and benchmarks pertaining to SWM	36
Appendix - III	Details of procurement of compost machines lying unused in four test checked ULBs	37
	Glossary	39
	Definition	40

Preface

This Report of the Comptroller and Auditor General of India for the year ended 31 March 2023 has been prepared for submission to the Governor of the State of Rajasthan under Article 151(2) of the Constitution of India.

The Report contains the results of the Performance Audit on **‘Solid Waste Management in Urban Local Bodies’**, covering the period 2017-23.

The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Executive Summary

Executive Summary

Purpose to undertake this audit

Municipal Solid Waste Management in urban areas has emerged as one of the biggest challenges today. The situation is aggravated by rapid urbanisation. Inadequate management of waste has significant negative externalities in terms of public health and environmental outcomes. The Solid Waste Management Rules, 2016 provide a legal framework for the disposal and management of Solid waste and entrusts responsibilities at the State level, ULBs and on the generators of waste.

Effective Solid Waste Management requires policies, infrastructure, public awareness, and stakeholder participation. It is a shared responsibility among authorities, urban local bodies, waste management agencies, communities, and individuals.

This Performance audit examines the solid waste management in Urban Local Bodies from end to end i.e. collection, segregation, processing and disposal of waste. It also assesses the adequacy of resources, its efficient utilization and monitoring of SWM.

Major Audit Observations

Planning for Solid Waste Management

Out of 18 test checked ULBs, Detailed Project Reports (DPRs) were prepared only by six ULBs under ISWM/SBM 1.0 and 11 ULBs under SBM 2.0. In three test checked ULBs where DPR were prepared assessment method prescribed under the MSWM manual were not followed as two ULBs (Bhiwadi and Dungarpur) collected data on waste generation for three days instead of seven continuous days from different location and in different seasons and extrapolated it over the entire year. ULB Balotara also incorrectly calculated per capita waste generation by dividing waste disposed of in landfill by the population.

Inconsistency in estimated waste generation data between State and test checked 16 ULBs indicates unreliability of data and lack of monitoring and coordination among ULBs and State Government.

Management of Solid Waste in ULBs

Analysis of the service level benchmark (SLB) indicators stipulated by the Ministry of Urban Development, GoI showed that in the test checked ULBs, the achievement of the majority performance indicators was significantly low against the fixed targets.

Processing of waste was only 11 per cent to 25 per cent at State level and 29 per cent to 35 per cent in test checked ULBs. Direct dumping of solid waste ranged between 63 per cent to 79 per cent at the State level and 65 per cent to 71 per cent in test checked ULBs. Thus, remaining unprocessed waste at State level was not being dumped at dumping site. Instances of variation in reported figures of waste collection and actual waste collection were also noticed in test checked ULBs.

It was observed that the quantity of waste generated reported by the Director Local Bodies to audit was different from the figures reported by the ULBs in their Annual Report to the Rajasthan State Pollution Control Board.

Out of 18 test checked ULBs, weigh bridges were not installed in 14 ULBs due to which daily waste collection could not be measured and monitored properly. Further, eight weigh bridges were installed in remaining four ULBs. In Municipal Council, Bhiwadi one of the vehicles shown to have been used for waste collection was found to be a passenger vehicle.

Radio Frequency Identification (RFID) waste management system solutions support identification and traceability of waste. It was observed that only three out of 18 test checked ULBs made provisions in respective bid documents for installation of RFID at each household. RFID is reported to have been installed in two zones of Municipal Corporation, Jaipur (Greater) only.

Only 50 *per cent* to 60 *per cent* of ULBs in the State undertook segregation of waste at secondary storage facilities during 2021-23. Out of 18 test checked ULBs, 11 ULBs reported non segregation of solid waste at secondary storage facilities during 2021-22 and it reduced to five ULBs in 2022-23.

Neither specific centres were established for deposition of hazardous waste nor hazardous/sanitary waste was segregated at source/secondary source in 12 test checked ULBs. During the physical verification of secondary storage/dumpsites, instances were seen where mixed waste was dumped.

Though material recovery facilities were available in all 18 test checked ULBs, however, during physical verification it was observed that in nine test checked ULBs material recovery facilities or secondary storages facilities were not covered or fenced, which allowed the stray animals to move around the waste storage sites. Storages were not cleaned regularly which resulted in overflowing of waste and littering on the roadside.

Test checked 17 ULBs did not follow provisions of the byelaws related to optimum utilisation of solid waste and dumped the waste in landfill/dump sites. Only one ULB (Municipal Corporation, Jaipur) used the Refuse Derived Fuel method and techniques of composting for recycling of solid waste.

Six out of 18 test checked ULBs procured compost machines of different capacities between February 2019 and December 2019. Out of these, in four ULBs compost machines were not used since their installation.

Due to inordinate delay in setting up of waste to energy plants, waste could not be processed and leading to piling up to dump unprocessed at dumping sites.

The processing of Construction and Demolition (C&D) waste is important as per C&D Waste Management Rule, 2016. It prevents unscientific disposal that causes air, water and soil pollution and it reduces dust, littering, and unmanaged dumping. Construction and Demolition (C&D) waste comprises of buildings materials, debris and rubble resulting from construction, repair and demolition of any civil structure. Four (Bikaner, Jaipur, Jodhpur and Udaipur) out of 18 test checked ULBs were eligible for setting up of Construction & Demolition (C&D) processing plant. Only Municipal Corporation, Udaipur set up one C&D waste processing plant in the State. This plant was also not functioning due to

want of O&M. Due to non-set up of C&D waste processing plant the C&D waste is being mixed with solid waste or disposed in low lying area.

Out of 18 test checked Urban Local Bodies, 15 ULBs did not construct sanitary landfill sites and dumped the municipal solid waste in open dumping sites. Though Municipal Corporation, Jaipur and Municipal Council Baran constructed landfill sites in year 2012 and 2016 respectively at a cost of ₹ 12.06 crore but these remain unutilized since their construction due to non-setting up of processing plants which resulted in Municipal Solid Waste being dumped in open dumping site.

Monitoring and Information, Education and Communication Activities

Health and Sanitation committees essential for planning and monitoring public health and sanitation activities were not constituted in 12 test checked ULBs.

Only six test checked ULBs undertook audio, visual, mass communication and advocacy and outreach activities. Remaining 12 ULBs did not conduct any Information, Education and Communication activities during 2017-18 to 2021-22 despite allotment of separate funds of ₹ 11.99 crore to these ULBs.

Recommendations

- *The State Government may ensure compliance of procedures laid down for estimation of waste generation and preparation of DPR as per MSWM Manual by all ULBs for effective planning of Solid Waste Management.*
- *The State Government may ensure installation of weigh bridges and RFID cards in all ULBs for accurate measurement and to check collection efficiency.*
- *The State Government should undertake advocacy and outreach activities and Health & Sanitation Committees to ensure 100 per cent segregation of waste at secondary stage.*
- *The State Government may make efforts to reduce dependency on landfills by enhancing its processing capacity.*
- *The State Government should make material recovery facilities mandatory to divert recyclable material from landfills by increasing recycling rates and reducing waste sent to landfills.*
- *The State Government should ensure GPS enabled solid waste management vehicle for route optimization, real time tracking and enhanced customer services by ensuring timely waste collection.*

- *The State Government should take new initiative for composting and waste to energy plants in line with other cities like Indore, Ahmedabad, Pune and Gangtok.*
- *All Urban Local Bodies may undertake regular Information, Education and Communication activities to raise public awareness and promote responsible behaviour towards the Solid Waste Management.*

Chapter-I

Introduction

Performance Audit on Solid Waste Management in Urban Local Bodies

Chapter - I : Introduction

1.1 Solid Waste Management in Urban Local Bodies

Wastes are materials that the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose of. Wastes are generally classified into municipal solid waste, bio-medical waste, construction and demolition waste, e-waste, plastic waste, slaughterhouse waste, industrial waste and hazardous waste by virtue of their nature. It is also classified as biodegradable, non-biodegradable, combustible, dry and inert based on their characteristics.

Solid waste includes solid or semi-solid domestic waste, sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, agriculture and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, radio-active waste generated in the area under the local authorities.

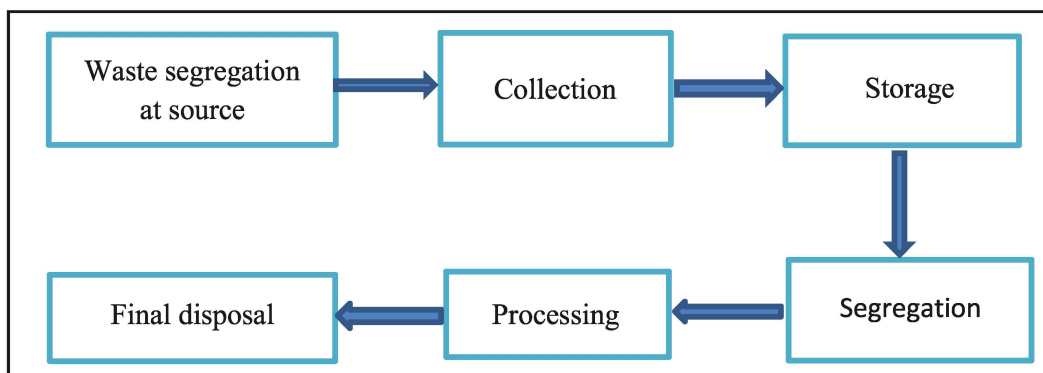
Municipal Solid Waste Management (MSWM) in urban areas has emerged as one of the biggest challenges. The situation is aggravated by rapid urbanisation. Although MSWM is an essential service and a mandatory function of municipal authorities across the country, it is still being managed inefficiently resulting in significant negative externalities in terms of public health and environmental outcomes.

1.2 Regulatory framework governing Management of Solid Waste

The Solid Waste Management (SWM) Rules 2016, provides a legal framework for disposal and management of solid waste and entrusts responsibilities at State level and Urban Local Bodies (ULBs) level. Article 243 w of the Constitution of India provides that the legislature of the State may by law endow the municipalities with such powers and authority as may be necessary to enable them to function as institutions of self-governance. The Twelfth schedule of the Constitution enumerates 18 specific functions to be devolved to Urban Local Bodies. The Government of Rajasthan (GoR) devolved the function “Solid Waste Management” to the Urban Local Bodies.

As per Solid Waste Management Rules, 2016 flow Chart of Municipal Solid Waste Management Chain is given in **Chart 1.1** below.

Chart – 1.1: Waste Management Chain



The process begins with waste collection from various sources, such as households, commercial establishments, institutions, and construction sites. The collected waste is transported to storage and then segregated into biodegradable, recyclable, non-recyclable, combustible, sanitary, inert and hazardous waste. Segregated waste undergoes treatment like composting, incineration, bio-methanation, and gasification techniques¹. Residual and inert waste is disposed of in landfills following sanitary practices to minimize environmental contamination and health risks.

Effective Solid Waste Management requires policies, infrastructure, public awareness, and stakeholder participation. It is a shared responsibility among authorities, Urban Local Bodies, waste management agencies, communities, and individuals.

1.2.1 Role of various authorities in Solid Waste Management

The role of various authorities at all levels in planning, execution and monitoring of Solid Waste Management is depicted in **Chart 1.2** below:

Chart 1.2: Role of various authorities in Municipal Solid Waste Management

State	Policy framing, Monitoring and Evaluation	Local Self Government Department	Approvals of Plans/DPRs and Monitoring
		State pollution Control Board	Review and Advisory
District	Monitoring and Evaluation	Regional Pollution Control Board offices	
Urban Local Bodies	Implementation	Municipal Corporations/Municipal Councils/Municipal Boards	

¹ Composting decomposes organic waste into nutrient-rich compost. Incineration generates energy through controlled burning. Bio-methanation produces biogas using anaerobic digestion. Gasification converts waste into synthetic gas for energy.

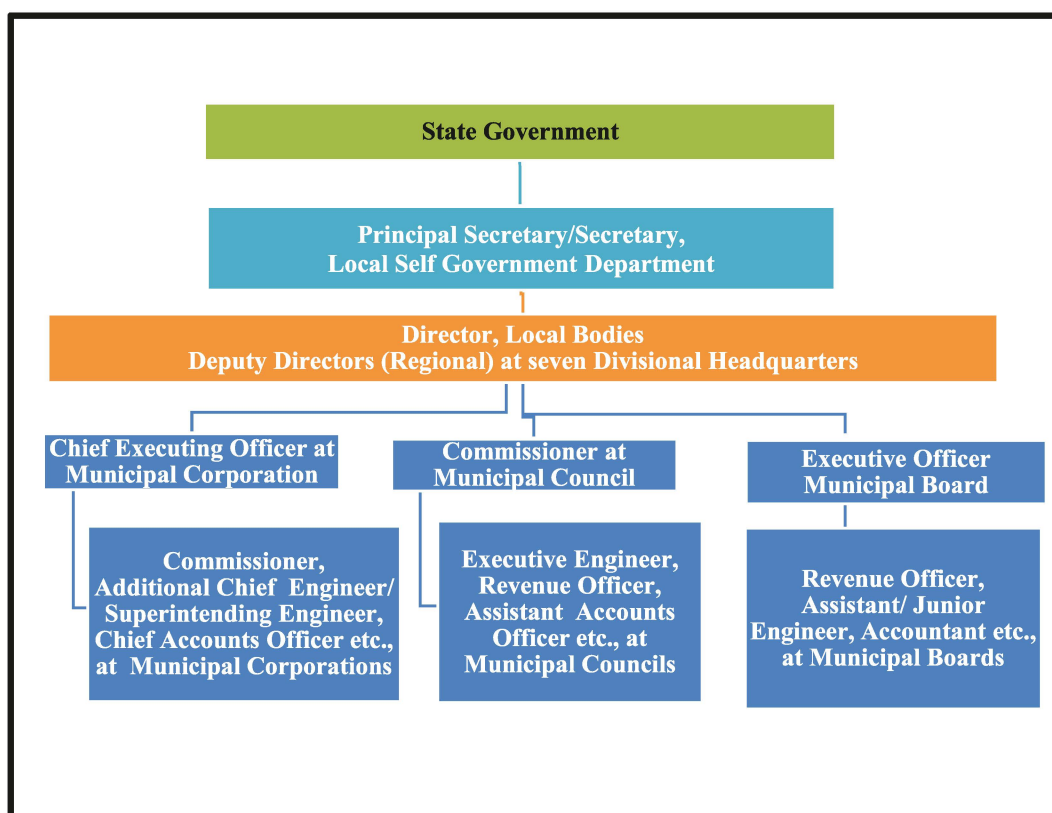
1.3 Financial Resources

During 2017-18 to 2022-23, the State Government received funds of ₹ 2,438.56 crore (Central Finance Commission grant: ₹ 2,266.41 crore and SBM 1.0 & 2.0 grant: ₹ 172.15 crore) which was entirely utilized and year wise break up is given in *Appendix-I*.

1.4 Organisational setup

The Local Self Government Department (LSGD), headed by the Principal Secretary/Secretary to the GoR, is the nodal department for the governance of all ULBs. The Directorate of Local Bodies (DLB) functions as an interface between the State Government and ULBs. The DLB has seven Deputy Directors (Regional) at Divisional Headquarters i.e., Ajmer, Bharatpur, Bikaner, Jaipur, Jodhpur, Kota and Udaipur, who reports to the DLB on day-to-day basis. The organizational structure with respect to the functioning of ULBs in the State is indicated in **Chart 1.3** below:

Chart 1.3: Organizational Structure



The State Pollution Control Board oversees the implementation of the various Rules under the Environment (Protection) Act, 1986, in the State and is responsible for monitoring and controlling Waste Management.

1.5 Audit Objectives

This Performance Audit was conducted to assess whether:

- adequate plans and strategies are in place to manage the urban solid waste by the Urban Local Bodies;
- the end-to-end process of Solid Waste Management, including collection, segregation, storage, transportation and disposal was conducted effectively and efficiently;
- necessary resources, facilities and equipment were available for Solid Waste Management and these resources were operated and maintained efficiently; and
- system of internal controls, monitoring and evaluation were adequate and effective.

1.6 Audit Scope and methodology

The Performance Audit on ‘Solid Waste Management in Urban Local Bodies’ in Rajasthan covering the period from 2017-18 to 2022-23 was conducted between August 2022 to December 2023.

18 Urban Local Bodies² (8.45 *per cent*) comprising four Municipal Corporations³, seven Municipal Councils⁴ and seven Municipal Board⁵ were selected by giving equal importance to all the seven divisions in the State. One Urban Local Body (Dungarpur) was selected at the request of the Secretary, Local Self Government Department (LSGD) during the Entry Conference. The other units were selected through random sampling using IDEA software. The Audit reviewed the records of the Local Self Government Department, Directorate of Local Bodies, State Pollution Control Board and selected Urban Local Bodies.

Entry Conference with the Principal Secretary, LSGD was held in August 2022. Exit Conferences with the Principal Secretary/Secretary, LSGD were held in June 2023 and March 2025 to discuss the findings of Performance Audit. Replies of the State Government have been appropriately incorporated in the report.

1.7 Audit Criteria

The audit findings were benchmarked against the following criteria:

- The Rajasthan Municipalities Act, 2009.

² Out of total 213 ULBs.

³ Municipal Corporation Bikaner, Jaipur, Jodhpur and Udaipur.

⁴ Balotara, Baran, Bhiwadi, Dungarpur, Hindaun City, Kishangarh and Sujangarh.

⁵ Bari, Bhawani Mandi, Choti Sadri, Deoli, Pokhran, Rajgarh and Sambhar Lake.

- Municipal Solid Waste Management Manual, 2016 and The Solid Waste Management Rules, 2016.
- Construction and Demolition Waste Management Rules, 2016.
- Performance parameters set out in Service Level Benchmarking guidelines.
- Instructions, guidelines, policies issued by Central and State Pollution Control Boards, Government of India/ State Government on solid waste management.

1.8 Acknowledgement

Audit acknowledges the co-operation of the Local Self Government Department, Director Local Bodies, Rajasthan Pollution Control Board and appreciates the assistance provided by the field functionaries of these departments for smooth conduct of the audit.

Chapter-II
Planning for Solid Waste
Management

Chapter - II: Planning for Solid Waste Management

2.1 Solid Waste Management Planning

Sound planning is a prerequisite for Solid Waste Management. Para 15 (a) of Solid Waste Management Rules, 2016 and section 1.4.6 of MSWM Manual, 2016 emphasised the need for ULBs to prepare a detailed Solid Waste Management plan with short term (five years) and long-term (20-25 years) actions. The five-year short-term plan may be broken up into specific action plans covering various aspects such as waste minimisation initiatives, waste collection and transportation, treatment and disposal, and other policy changes as may be deemed necessary.

Audit observations related to planning such as preparation of Detailed Project Reports (DPRs), method used for estimation of municipal solid waste generation are discussed in the succeeding paragraphs.

2.1.1 Preparation of DPRs

Urban Local Bodies prepared plans for Management of Solid Waste in the form of Detailed Project Report (DPR) under Integrated Solid Waste Management (ISWM)/Swachh Bharat Mission (SBM) 1.0 and SBM 2.0. In urban area, SBM 1.0 was started with effect from 2 October 2014 for five years and SBM 2.0 was started with effect from 1 October 2021 for five years. The position of preparation of DPRs under ISWM/SBM 1.0 and SBM 2.0 and their approval by State Level Technical Committee (DPR approved in June 2016 and in August 2023 under SBM 1.0 and 2.0 respectively) is given in **Table 2.1** below:

Table 2.1: Details of DPR prepared under SBM 1.0 and SBM 2.0

Number of ULBs	ISWM/SBM 1.0		SBM 2.0	
	State	Selected ULBs	State	Selected ULBs
Total ULBs	177	18	213	18
Work order issued for DPR	117	09	209	11
DPR prepared	66	06	194	11
DPR approved	62	04	194	11

(Source- Information provided by the DLB and selected ULBs)

It is evident from the above table that position of preparation of DPRs and their approval have improved under SBM 2.0 as coverage against existing ULBs has increased from 35 per cent to 91 per cent at State level and from 22 per cent to 61 per cent in selected ULBs.

However, all existing ULBs have not prepared DPRs as of July 2023.

State Government stated (March 2025) that till date DPRs of 214 ULBs have been prepared and approved in various meetings of State Level Technical Committee.

DPRs of few ULBs have not been prepared due to the following facts : (i) these are newly constituted and hence assessment of requirement and provision of required infrastructure like land for processing units are being made and DPRs will be prepared for left out ULBs as and when land is made available, (ii) in some ULBs processing facilities are already available and gaps in processing are not anticipated, and thus DPRs are not being prepared, (iii) in smaller ULBs planning is being made without preparing DPRs.

2.1.2 Estimation of Waste Generation in DPR

The MSWM Manual 2016 prescribes detailed methodology for estimation of municipal solid waste¹. The plan was to be based on assessment of existing quantum of waste generated, levels of collection and processing, available resources, and a gap analysis *vis a vis* future scenario.

Various issues related to method of planning noticed in test checked ULBs where DPRs were prepared under ISWM/SBM 1.0 are discussed below:

(a) The assessment method prescribed by the MSWM Manual requires collecting data on waste generation for seven continuous days, from multiple locations over three main seasons. However, deviations from the prescribed methodology were noticed in two test checked ULBs (Bhiwadi and Dungarpur), where the consultant collected data for only three days and extrapolated it over the entire year. In other four ULBs either seven days were considered, or number of days were not mentioned in the DPRs.

(b) In Balotra, the per capita waste generated in 2014 was calculated by dividing waste disposed in the landfill during 2014 by the population of 2011 census. This method was incorrect because the waste generated is not equal to the waste disposed at landfills. The per capita waste thus calculated was then extrapolated for the year 2024 and then for the year 2044, without explaining the basis of this population projection. Estimation for the years falling from 2024 to 2044 was not done.

State Government stated (March 2025) that the work of preparation of DPRs were outsourced by the State Government and the consultants were directed to prepare DPRs in accordance with the provisions as laid down in MSWM Manuals 2016. There may be some deviations, and these deficiencies have been removed in DPRs prepared under SBM 2.0.

The fact remains that department/concerned ULBs were required to ensure compliance of provisions of the MSWM Manual while approving the DPR.

¹ **For Long term-** Waste quantities should be aggregated over the 7-day period, weighed, and averaged. These quantities can then be extrapolated to the entire urban local body (ULB) and per capita generation. **For Short term-** At least 100 representative sampling locations per one lakh population including household, commercial establishments, hospitals etc. Waste collected from these categories for 7 days period, weighed and averaged represent the waste quantity and quality extrapolated to the entire ULB.

2.2 Inconsistency in data of waste generated

Inconsistency in data of assessment of waste at State level and ULB level

Section 1.4.3.3 of Municipal Solid Waste Management Manual 2016 prescribed estimation² of per capita per day waste generation and State/ULBs were required to use these norms for assessment of waste.

Audit compared the data of assessment of waste prepared by the State Government for all ULBs for the year 2021-22 with the assessment mentioned in Annual report of respective ULBs in case of selected ULBs and found inconsistency in data as shown in Table 2.2 below.

Table 2.2: Estimation of per capita per day (PCPD) generation of waste in test checked ULBs during 2021-22

S. No.	Name of the ULB	Norms of waste generation as per SWM Manual	Assessment of waste by the State Governmentt		Assessment of waste as per annual report of the ULB		Percentage of variance (+) Excess/ (-) Short*
			Population considered (as per census 2011) (in lakh)	Estimation of per capita per day waste generation	Population considered (as per census 2011) (In lakh)	Estimation of per capita per day waste generation	
1.	Jaipur	400-600	30.46	550	30.41	497	(-) 9.63
2.	Balotara	200-300	0.74	300	0.88	400	33.33
3.	Baran	200-300	1.18	450	1.43	343	(-) 23.77
4.	Udaipur	350-450	4.51	450	5.24	344	(-) 23.55
5.	Bikaner	350-450	6.44	450	7.80	450	-
6.	Bhawani Mandi	200-300	0.42	300	0.42	213	(-) 29
7.	Deoli	200-300	0.22	300	0.22	453	51
8.	Jodhpur	350-450	10.34	450	13	369	(-) 18
9.	Pokran	200-300	0.24	300	0.29	206	(-) 31.33
10.	Hindaun City	200-300	1.05	450	1.05	398	(-) 11.55
11.	Choti Sadri	200-300	0.18	300	0.18	381	27
12.	Rajgarh	200-300	0.59	300	0.80	400	33.33
13.	Sujargarh	200-300	1.02	450	1.01	450	-
14.	Kishangarh	200-300	1.55	450	1.55	464	3.11
15.	Sambhar Lake	200-300	0.22	300	0.22	358	19.33
16.	Bari	200-300	0.63	300	0.74	377	25.66
17.	Bhiwadi	200-300	1.05	450	1.05	572	27.11
18.	Dungarpur	200-300	0.48	300	0.52	314	4.66

(Source: Information provided by DLB and Form-IV of concerned ULBs)

* Excess means assessment of waste done by ULBs is more than the assessment of waste done by the State Government.

² As per MSWM Manual 2016, per capita per day 200–300 gram waste generation was estimated for ULBs having population below 2 lakh, 300–350 gram per capita per day waste for ULBs having population 2 lakh to 5 lakh, 350–400 gram per capita per day waste for ULBs having population 5 lakh to 10 lakh and 400–600 gram per capita per day waste generation was estimated for ULBs having population more than 10 lakh.

Audit observed that in 16 out of 18 ULBs, there were variations in assessment of waste generation between State Government and the annual reports of concerned ULBs. State Government and concerned ULBs adopted different methods for calculation of waste generation. The State Government calculated estimation of waste at a uniform rate³ whereas source of norms adopted by test checked ULBs were not mentioned in their annual reports. It was also noticed that the State Government and the concerned selected ULBs considered different population of the ULB for same year.

In one ULB (Deoli), variation in assessment was 51 *per cent* while in seven ULBs (Bari, Balotra, Bhawani Mandi, Bhiwadi, Choti Sadri, Pokaran and Rajgarh) variation was about 25 to 33 *per cent*. In eight ULBs, variation in assessment ranged from three *per cent* to 24 *per cent*.

State Government stated (March 2025) that it estimated waste generation on the basis of norms prescribed in the current effective SBM 2.0 guidelines.

This indicates towards the unreliability of the data on estimated waste generated in the State, which has further impact on the effectiveness of planning and monitoring of waste management in the State.

2.3 Conclusion

DPRs of all existing ULBs were not prepared. Inconsistency in estimated waste generation data between State and concerned ULB indicates unreliability of data and lack of monitoring and coordination among ULB and State Government.

Recommendations:

1. The State Government may ensure compliance of procedures laid down for estimation of waste generation and preparation of DPR as per MSWM Manual by all ULBs for effective planning of Solid Waste Management.

³ 350 gram per capita per day generation of waste for ULBs having population up to one lakh, 450 gram per capita per day generation of waste for population between one lakh to 10 lakh and 550 gram per capita per day for ULBs having population more than 10 lakh.

Chapter-III
Management of Solid Waste in
ULBs

Chapter - III: Management of Solid Waste in ULBs

The Solid Waste Management process begins with the collection of segregated waste, transportation of waste to transfer station/central sorting facility for sorting recyclables, processing of waste and disposal in landfills. The effectiveness and efficiency in the solid waste management process as analyzed by audit are discussed in the succeeding paragraphs.

3.1 Targets and achievements against Service Level Benchmarks

MSWM Manual, 2016- Part I, Para 7.1-Monitoring of Municipal Solid Waste Management Plan Implementation envisaged the assessment of Service Level Benchmarks (SLBs).

Ministry of Urban Development, GoI launched (2008) the Service Level Benchmarking initiative covering Municipal Solid Waste and defined performance indicators for assessing the performance of Solid Waste Management. The eight performance indicators of Solid Waste Management prescribed on the recommendation of the Fifteenth Finance Commission by Government of India are given in **Table 3.1** below:

Table 3.1: SLB performance indicators and benchmarks pertaining to SWM

S.No.	Performance indicator	Description of item	Benchmark (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 solid waste	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 sanitary landfill after processing of waste	100
6	Extent of cost recovery in SWM services	Recovery of all operating expenses related to SWM	100
7	Efficiency in redressal of customer complaints	Number of complaints related to SWM resolved within 24 hours	80
8	Efficiency in collection of SWM user charges	Revenues collected against total operating revenues	90

(Source: prescribed by the Ministry of Urban Development, Government of India)

Achievement of Performance indicators against the prescribed benchmark by the test check ULBs during 2022-23 is given in the **Appendix-II**. Audit summarized indicator wise range of achievements against the prescribed benchmark as reported by 18 test checked ULBs in their Service Level Benchmarks for the year 2022-23

to the Ministry of Housing and Urban Affairs, Government of India in compliance with directions issued by DLB are shown in **Table 3.2** below

Table 3.2: Range of achievements of SLB by test checked ULBs during the year 2022-23

Performance indicator	Achievements by test checked ULBs				
	Nil	Up to 50 per cent	51 to 75 per cent	76 to 99 per cent	100 per cent
Household level coverage of SWM services	0	0	0	13	5
Efficiency of collection of municipal solid waste	0	0	0	12	6
Extent of segregation of municipal solid waste	5	5	1	5	2
Extent of municipal solid waste recovered	8	3	2	4	1
Extent of scientific disposal of municipal solid waste	10	1	2	4	1
Extent of cost recovery in SWM services	8	5	0	4	1
Efficiency in redressal of customer complaints	2	0	0	14	2
Efficiency in collection of SWM user charges	9	6	0	3	0

(source: Information collected from City Finance Portal through DLB)

The above table (read with **Appendix-II**) shows that:

- Under Household level coverage of SWM services out of 18 test checked ULBs only five (28 per cent) ULBs achieved the target.
- Efficiency of collection of municipal solid waste benchmark achieved by only six ULBs (33 per cent) out of 18 test checked ULBs.
- Extent of segregation of municipal solid waste was achieved by only two ULBs and five ULBs (28 per cent) had nil achievement in segregation.
- Achievement under Extent of municipal solid waste recovered was nil in eight ULBs (44 per cent) out of 18 ULBs and only five ULBs achieved the target.
- Achievement under the Extent of scientific disposal of municipal solid waste was nil in 10 ULBs (56 per cent) out of 18 ULBs and only one ULB achieved the target.
- Achievement under extent of cost recovery in SWM services was nil in 8 ULBs (44 per cent) and only one ULB achieved the target.
- Efficiency in redressal of customer complaints of municipal solid waste was achieved in 16 ULBs (89 per cent) out of 18 test checked ULBs. Whereas two ULBs had nil achievement.
- Efficiency in collection of SWM user charges was nil in 9 ULBs (50 per cent), and only one ULB achieved the target.

Analysis of the service level benchmark (SLB) indicators stipulated by the Ministry of Urban Development showed that in the test checked ULBs, the achievement of the majority performance indicators was significantly low against the fixed targets.

The State Government stated (March 2025) that remaining ULBs would be persuaded to collect 100 *per cent* waste and efforts are being made to improve the percentage of segregation. The GoR stated that the scientific disposal of municipal waste is the weakest segment of SWM, however, numbers of dump yards have been scientifically bio remedied under SBM 2.0. It has been accepted that the ULBs are lagging behind in collection of user charges as several ULBs were reluctant to recover the user charges, but now there is considerable increase in recovery of user charges. All the ULBs are being directed to achieve 100 *per cent* of targets of service level benchmarks.

3.2 Status of generation, collection and processing of Solid Waste

Solid waste generated, collected and processed at the State as well as test checked 18 ULBs during 2017-18 to 2022-23 (in ton per day) are shown in **Table 3.3** and **Table 3.4** below:

Table 3.3 Solid waste generated, collected and processed at the State Level

(in TPD)						
Particular	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Generated	6439.27	6625.56	6659.38	6897.15	7973.15	6836.68
Collected	6280.54 (98%)	6475.39 (98%)	6475.90 (97%)	6720.47 (97%)	7859.35 (99%)	6733.94 (98%)
Processed	695.35 (11%)	780.18 (12%)	1190.93 (18%)	1210.45 (18%)	1925.97 (25%)	1473.97 (22%)
Direct dumped	3983.7 (63%)	4187.16 (65%)	5112.66 (79%)	5082.16 (76%)	5525.18 (70%)	4828.76 (72%)

(Source: Information compiled from annual report of RSPCB)

Table 3.4: Solid waste generated, collected and processed at the test checked ULBs

(in TPD)						
Particulars	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Generated	2803.78	2901.80	2976.15	2977.73	3104.49	3370.10
Collected	2582.67 (92%)	2846.31 (98%)	2947.84 (99%)	2934.47 (99%)	3079.26 (99%)	3346.02 (99%)
Processed	781 (30%)	920 (32%)	1018.43 (35%)	903.46 (31%)	985.97 (32%)	980.34 (29%)
Direct dumping	1801.67 (70%)	1904.25 (67%)	1929.41 (65%)	2031.01 (69%)	2093.29 (68%)	2365.68 (71%)

(Source: Information provided by test checked ULBs)

The above comparison of the generation, collections and processing of solid waste shows that during 2017-23 against the generation significant percentage of waste was collected at State level (97 *per cent* to 99 *per cent*) and in test checked ULBs (92 *per cent* to 99 *per cent*). However, processing of waste was only 11 *per cent* to 25 *per cent* at State level and 29 *per cent* to 35 *per cent* in test checked ULBs. Further, direct dumping of solid waste ranged between 63 *per cent* to 79 *per cent* at the State level and 65 *per cent* to 71 *per cent* in test checked ULBs. Thus, remaining unprocessed waste at State level was not being dumped at dumped site. Audit also noticed instances of variation in reported figures of waste collection and actual waste collection in test checked ULBs as discussed in the succeeding para 3.3.1, which creates doubt on reliability of data being reported by the ULBs in respect of waste collection.

The State Government stated (March 2025) that for processing of Municipal Solid Waste processing plants are being established and the reject from these plants will be disposed of in Sanitary Landfill Facility being established under SBM 2.0.

3.3 Collection of Solid Waste

Collection of segregated municipal solid waste is an essential step in municipal SWM. Inefficient waste collection services have an impact on public health and the aesthetics of towns and cities. Collection of wet, dry and domestic hazardous waste separately ensures maximum recovery of recyclable waste and also paves the way for cost-effective treatment of such wastes. The collection service provided by ULBs also needs to be regular to be effective.

Audit observations pertaining to reported figures of waste collection, reporting incorrect data, deficient system for measurement of collection and non-installation of GPS system in vehicles used for waste collection etc. are discussed in the succeeding paragraphs:

3.3.1 Difference between waste collection reported and actual waste collection

During audit of test checked 18 ULBs instances have been noticed in four ULBs where the actual collection was higher or lesser than the reported collection of waste as detailed below:

- (i) Municipal Corporation, Jaipur in its annual reports reported 100 *per cent* collection of waste during 2019-20 i.e. 1477 TPD. Audit noticed that during July 2019 to March 2020 an average 1581 TPD waste was collected by the contractor. During 2022-23 waste collection was reported as 1640 TPD, whereas audit noticed that in addition to this (1640 TPD), the Municipal Corporation also engaged its own fleet having capacity of 325 TPD for collection and transportation of waste.

(ii) The estimated quantity of waste generation in Municipal Corporation, Bikaner during 2021-23 was 363 TPD against which the Municipal Corporation claimed to have collected 363 TPD (100 *per cent*). Audit observed that in addition to 363 TPD waste collected from households, 233.60 TPD waste was also collected from roadside by deploying additional resources during August 2021 to March 2023. Thus, the Municipal Corporation understated the actual collection of waste.

(iii) Municipal Corporation, Jodhpur reported 100 *per cent* collection of waste during 2019-20 to 2022-23. Audit observed that against the estimated waste of an average 497 TPD per year, an average 14.93 TPD waste was not collected by the contractor from January 2019 to August 2023 for which penalty was recovered from contractors.

(iv) Municipal Council, Sujangarh reported 25 TPD (100 *per cent*) collection of waste during 2018-19. Audit observed that an average of 31.40 TPD waste was collected during the same period.

Thus, it is clear that ULBs are not reporting correct figures of waste collection and this variation also indicates towards unrealistic estimation as actual collection have huge variation from estimated generation.

The State Government replied (March 2025) that own vehicles are also used for collection of slit, road side waste and other kind of waste which do not fall under the scope of outsourced firm and transported it to dump yard.

3.3.2 Inconsistency of data reported to RSPCB and Audit

As per Rule 15(za&zb) of SWM Rules 2016, every ULB had to prepare and submit annual report by 30 April of succeeding year to Director Local Bodies who in turn will send the report to Rajasthan State Pollution Control Board (RSPCB) by 31 May of every year.

Audit observed that the quantity of waste generated reported by the DLB to audit was different from the figures reported by the ULBs in their Annual Reports to the RSPCB. As per information provided to audit, Solid Waste generation and collection in 2021-22 for the entire State was 6829 TPD, whereas the data submitted by ULBs to RSPCB, the annual generation and collection of Solid Waste at State level shown as 7973 TPD and 7859 TPD respectively for the entire State. Thus, there was a variation of 1144 TPD and 1030 TPD in generation and collection respectively.

Audit compared the data of generation and collection of waste reported to audit and to RSPCB by the 18 test checked ULBs and observed variation between these data in four test checked ULBs as detailed in **Table 3.5** below:

Table 3.5: Difference in data of generation and collection of waste

(TPD)

Name of ULB	Year	Report to Audit	Report to RSPCB	Difference
Deoli	2019-20	8.90	10	1.10
	2020-21	9.10	10	0.90
Choti Sadri	2018-19	8.58	7	1.58
Pokhran	2020-21	8.62	6	2.62
Sambhar lake	2022-23	8.10	8	0.10

(Source: Information provided by the concerned ULBs)

The State Government accepted (March 2025) the facts and stated that there may be some inconsistency as these data are based on estimation, but data provided through Annual Reports were on actual basis. However, all ULBs would be directed to submit data to various agencies uniformly.

3.3.3 Deficient system for measurement of collection and transportation of waste

As per MSWM Manual 2016, the ULBs are required to install weigh bridges to measure the weight of the waste collected daily so that the collection can be monitored. Audit found that out of 18 test checked ULBs, eight weigh bridges were installed only in four ULBs (Bikaner: 01, Jaipur: 03, Jodhpur: 01 and Udaipur: 03). However, weigh bridges were not installed in 14 ULBs due to which daily waste collection could not be measured and monitored properly.

Audit observed that in Municipal Council, Bhiwadi, fraudulent weigh slips were being submitted by the contractors and payment was made against them. One of the vehicles shown to have been used for waste collection was found to be a passenger vehicle (Maruti Wagon R- HR31D4814). Audit observed that this vehicle made 56 trips during the month of July 2019 and shown transport of 55.36 tonnage waste.

State Government stated (March 2025) that all ULBs would be directed to install weigh bridges and ensure their functioning. Further, it was stated that the number of registration of car in Bhiwadi may have been noted erroneously.

The reply of the State Government is not tenable as the registration number of vehicle (Wagon R) having HR number was found noted on weigh slips several times during the month of July 2019, which cannot be termed as a onetime error and that creates doubt on the reliability on shown data related to waste transportation and collection.

Audit is of the view that the whole system of measuring the collection of waste is exposed to the risk of fraud and manipulation, and effective measures to ensure accountability and responsibility need to be taken to improve the system.

3.3.4 Global Positioning System not installed on transportation vehicles

According to MSWM Manual 2016, Global Positioning System (GPS) was to be installed on waste transportation vehicles for better monitoring of their movement and enable better control of solid waste management. Further, Local Self Government Department instructed (September 2017) all ULBs to install Vehicle Tracking System on all vehicles used for transportation of Solid Waste.

Audit observed that in 18 test checked ULBs, GPS/Vehicle Tracking System was not installed in owned vehicles used for collection and transportation of waste by ULBs.

State Government accepted (March 2025) that ULBs owned vehicles may have not equipped with the GPS and stated that at DLB level, orders have been issued from time to time to equip with the GPS and compliance of the order will be ensured strictly.

Thus, in the absence of GPS, monitoring of movement of waste transportation vehicles for better control of Solid Waste Management could not be ensured.

3.3.5 Installation of Radio Frequency Identification (RFID) cards

Radio Frequency Identification (RFID) waste management system solutions support identification and traceability of waste. Audit noticed that only three {Bikaner, Jaipur (Greater) and Kishangarh} out of 18 test checked ULBs made provisions in respective bid documents for installation of RFID at each household.

RFID is reported to have been installed in two zones of Municipal Corporation, Jaipur (Greater) only. Audit observed that the Municipal Corporation Jaipur awarded a work order (July 2022) to a firm for installation of RFID cards to an estimated 80,493 households of Malviya Nagar Zone and the firm was to be paid after actual survey of households. The firm intimated 98,492 households after the actual survey. As per the agreement, a penalty at the rate of ₹ five per household per day was to be deducted from the firm in case 100 *per cent* of the households were not covered.

The firm submitted a bill (₹1.11 crore) for the month of July 2023 for 98,492 households, whereas the Independent Engineer on verification reported that the firm did not submit scan reports of an average of 7,999 households during the month. Audit observed that the Municipal Corporation paid¹ ₹ 97.03 lakh to the firm for all 98,492 households, without reducing 7,999 households from where the waste was not collected. Although, the penalty amounting to ₹ 12.40 lakh at the

¹ 98492 households at the rate ₹ 111.60 per month per household (1 to 24 July 2023) and ₹ 114.95 per month per household (25 to 31 July 2023), total payment ₹ 110.66 lakh, reduced penalty ₹ 13.63 lakh (₹12.40 lakh for non-coverage of households and ₹ 1.23 lakh for other penalties). Paid amount ₹ 97.03 lakh.

rate of ₹ five per household was collected from the firm for 7,999 households but the firm was paid an excess amount of ₹ 8.98 lakh for uncollected waste for 7,999 household without collection of waste.

State Government stated (March 2025) that remaining ULBs are being directed to focus on installation of RFID cards to ascertain the actual coverage of households. However, the reply was not furnished for the excess payment paid to the firm.

3.3.6 Installation of smart dust bins

(i) Municipal Corporation Jodhpur decided (August 2017) to procure 55 smart dustbins² with an estimated cost of ₹ 7.42 crore (including O&M cost of ₹ 5 crore). These smart bins were to be equipped with sensors and a Bin Tracking System (BTS)/Global Positioning System (GPS). These sensor equipped bins were to send alerts after the bins were filled up to empty the bins immediately.

The Municipal Corporation, Jodhpur awarded (November 2017) a work order in favour of M/s Zonta Infratech Private Limited with a stipulated period for supply/installation of bins between 20 November 2017 and 19 May 2018 and for O&M of bins for five years. The firm installed these 55 smart bins in March 2018 at different locations provided by the Municipal Corporation and ₹ 1.88 crore was paid to the firm including O&M upto fourth running bill in March 2019.

Audit observed that:

- a) The firm did not install the sensors and in the absence of the sensors, the envisaged benefits could not be achieved.
- b) During physical inspection (10 October 2022) it was found that these smart bins were not cleaned regularly and at one location smart bin was not found installed.

² 15 smart dustbins having capacity of 2 cubic meter each and 40 smart dustbins having capacity of 1.5 cubic meter each.



Thus, the very purpose of installation of these smart bins was defeated and these costly smart bins remained like ordinary iron dust bins. The expenditure of ₹ 1.88 crore incurred on these smart bins proved to be infructuous.

The State Government stated (March 2025) that Municipal Corporation, Jodhpur has been directed to forward factual position and after receipts of the same, concrete factual position would be furnished to audit.

3.3.7 Involvement of Self-Help Groups and waste pickers

Rule 15 (c) and (d) of SWM Rules 2016 prescribe to regulate and promote the involvement of waste pickers or informal waste collectors in Solid Waste Management. Urban Local Bodies were to facilitate the formation of Self-Help Groups (SHG), provide identity cards and authorize them to pick waste from collection, storage or dumping sites.

Test check of selected Urban Local Bodies revealed that: -

(i) Only two Urban Local Bodies (Municipal Corporation, Jaipur and Municipal Corporation, Udaipur) conducted survey and issued identity cards to waste pickers. Jodhpur prepared a list of waste pickers and the basis for preparation of list was not mentioned. No identity card was issued to the waste pickers by Jodhpur.

(ii) SHG was established by only Municipal Corporation, Udaipur and the remaining 17 Urban Local Bodies did not establish any Self-Help Group.

State Government stated (March 2025) that each and every ULB has recognized role of waste pickers and allowed rag pickers to segregate the waste. In smaller ULBs it may be possible that they did not issue any identity cards. Moreover, the work of Solid Waste Management in ULBs with small quantum of waste generation is planned to be done through convergence of SBM and SHG of National Urban Livelihood Mission (NULM).

The reply is contrary to the fact that only three out of 18 test checked Urban Local Bodies had recognized the role of waste pickers and formation of Self-Help-Group is yet to be done in ULBs.

3.4 Segregation of Solid Waste

Solid waste is segregated at two stages wherein at the first stage, biodegradable and non-biodegradable waste is collected at source in separate containers, at the second stage, waste is segregated at secondary storage/dump sites before its processing where various components of municipal solid waste namely biodegradable waste, recyclable waste, non-recyclable combustible waste, sanitary waste, non-recyclable inert waste and domestic hazardous waste are sorted and separately stored.

Rule 15 (b) of SWM Rules 2016 prescribes that ULBs shall arrange for door to door collection of segregated solid waste from all households and commercial institutions etc.

During audit, issues regarding segregation of solid waste, segregation of hazardous waste and facilities for segregation at secondary storage sites have been noticed as discussed in the succeeding paragraphs:

3.4.1 Status of segregation of waste

Director Local Bodies intimated that about 60 *per cent* Solid Waste was segregated at source in the State during 2022-23.

Further as per data shown in Annual reports of all ULBs, it was observed that only 50 *per cent* and 60 *per cent* of ULBs³ in the State undertook segregation of waste at secondary storage facilities during 2021-22 and 2022-23 respectively. The segregation of solid waste at secondary storage facilities during 2021-22 and 2022-23 in the test-checked 18 Urban Local Bodies is shown in **Table 3.6** below:

³ 104 out of 207 ULBs in 2021-22 and 133 out of 221 in 2022-23.

Table 3.6: Secondary segregation of waste in test checked ULBs

Particulars	2021-22		2022-23	
	Number of ULBs	Name of ULBs	Number of ULBs	Name of ULBs
100 per cent segregation	3 (17%)	Udaipur, Dungarpur and Kishangarh	2 (11%)	Dungarpur and Kishangarh
Partial segregation	4 (22%)	Jaipur, Jodhpur, Bikaner and Baran	11 (61%)	Jaipur, Jodhpur, Bikaner, Udaipur, Balotara, Hindaun City, Sambhar Lake, Sujangarh, Bari, Rajgarh, Bhiwadi
No segregation	11 (61%)	Balotara, Bhiwadi, Hindaun City, Sujangarh, Bari, Bhawani Mandi, Choti Sadri, Deoli, Pokhran, Rajgarh, Sambhar Lake	5 (28%)	Bhawani Mandi, Baran, Pokhran, Deoli and Choti Sadri

(Source: service level benchmark forms and information provided by test checked ULBs)

It can be seen from the above table that position of segregation of waste at secondary stage was slightly improved in test checked ULBs in 2022-23. However, in Udaipur segregation of waste was reduced to 80 *per cent* in 2022-23 from 100 *per cent* in 2021-22.

Further, it was observed that in two ULBs (Bari and Hindaun City) contract for collection, segregation and processing of the waste was awarded (September 2021 and August 2022) to firms. As per the contract both ULBs had to make payment to the firm in the following ratio: (a) 40 *per cent* on collection (b) 30 *per cent* on segregation and (c) remaining 30 *per cent* on processing of the waste. During joint physical verification⁴ of both ULBs, it was noticed that waste was neither segregated nor processed.

State Government accepted the facts and stated (March 2025) that extent of source segregation of waste depends on the involvement of waste generation/residents. ULBs are doing regular IEC activities for motivating the residents for segregating the waste. Every ULB has twin compartments in its auto tippers and segregating waste into dry and wet waste at household level. In Bari and Hindaun City, both ULBs made conditions in the agreement for collection, transportation, segregation and processing of waste but as these firms did not work satisfactorily, the agreement was rescinded.

3.4.2 Segregation of domestic hazardous waste and sanitary waste

Domestic hazardous waste consists mainly of discarded paint drums, pesticide cans, compact fluorescent bulbs, expired medicines, used batteries, used needles and

⁴ Bari: 28 September 2022 and Hindaun City: 19 May 2024.

syringes, and contaminated gauge. Sanitary waste comprises of used diapers, sanitary towels or napkins. As per Rule 15 (i) of SWM Rules 2016, ULBs shall establish waste deposition centres within 20 square km for domestic hazardous waste and give direction for waste generators to deposit domestic hazardous wastes at this centre for its safe disposal. All waste generators are required to segregate such waste at the source so that further action could be taken for their safe disposal.

Audit observed that neither specific centres were established for deposition of hazardous waste nor hazardous/sanitary waste was segregated at source/secondary source in 12 out of 18 test checked ULBs. During the physical verification of secondary storage/dumpsites⁵, instances were seen where mixed waste was dumped.



Image showing mixed waste and unfenced secondary storage at Jaipur.

State Government stated (March 2025) that waste collection vehicles have separate bin for collection of domestic hazardous waste. The hazardous waste given by local residents are collected in these bins but if waste is given by residents in a mixed way it is very difficult to separate the hazardous waste from mixed waste. For segregation of waste at processing site the processing plants are being established in each ULB under SBM 2.0.

3.4.3 Facilities for segregation

Every Urban Local Body⁶ should setup Material Recovery Facilities (MRF) or secondary storage facilities with sufficient space to enable authorized waste pickers and waste collectors to separate recyclable waste such as paper, plastic, metal, glass, and textile. National Green Tribunal also directed (2018) that adequate material

⁵ Dumpsite is a place where waste materials are deposited without any planning or consideration for environmental or health standards.

⁶ Rule 15 (h) of Solid Waste Management Rules 2016 & Section 2.3.2 of MSWM Manual 2016.

recovery facility/secondary storage facilities be constructed for segregation of solid waste.

Material recovery facilities were available in all 18 test checked ULBs. During physical verification (October to November 2022) of material recovery facilities in all 18 test checked Urban Local Bodies, Audit observed that in nine⁷ ULBs:

- (i) Material recovery facilities or secondary storages facilities were not covered or fenced, which allowed the stray animals to move around the waste storage sites.
- (ii) Storages were not cleaned regularly which resulted in overflowing of waste and littering on the roadside.
- (iii) Storage bins were not suitably designed for easy operations with regard to handling, transferring and transporting of waste.
- (iv) Bins were also not in prescribed colour format.
- (v) No segregation was done at source and mixed waste was dumped in these secondary storage facilities.



Thus, uncovered storages, non-segregation of waste and lack of regular cleaning of bins led to littering of waste and unhygienic conditions.

The State Government accepted the facts and stated that most of MRF centers have since been made functional and working properly and efforts were being made to clean storage regularly. Further, under the mandate of SBM 2.0 the processing facility in all ULBs are being established.

⁷ Bhiwadi, Bikaner, Choti Sadri, Deoli, Hindaun City, Pokhran, Rajgarh, Sambhar Lake and Sujargarh.

3.5 Processing and disposal of Solid Waste

Audit observations regarding non adopting technique of Reduce, Reuse and Recycle of waste, processing of waste, non-utilisation of composte machine, inordinate delay in setting up of waste to energy plant, non-construction of sanitary landfills and non-closure of dump sites are discussed in succeeding paragraphs:

3.5.1 Optimum utilisation of Solid Waste

Rule 11 (b) of SWM Rules 2016 provided that Secretary, LSGD while preparing State policy and strategy on SWM, lay emphasis on waste reduction, reuse, recycling, recovery and optimum utilisation of various components of solid waste to ensure minimisation of waste going to the landfill and minimise impact of solid waste on human health and environment.

Audit observed that LSGD issued byelaws 2015 and updated in 2019 which included provisions related to reduction, reuse, recycling, recovery and optimum utilisation of solid waste. However, test checked 17 ULBs did not follow provisions of the byelaws related to optimum utilisation of solid waste and dumped the waste in landfill/dump sites. Only one ULB (Municipal Corporation, Jaipur) used the Refuse Derived Fuel (RDF) method and techniques of composting for recycling of solid waste and remaining 17 ULBs did not initiate any action for optimum utilisation of solid waste as of March 2023.

State Government stated (March 2025) that guidelines were issued regularly and position of waste processing facilities has been improved during 2023-25. At present 22 processing plants are operational, 155 plants are under construction and tendering of 33 plants are under process.

Audit observed that Municipal Corporation Gangtok had established (June 2024) a Reduce, Reuse and Recycle (RRR) Centre at Deorali. This initiative underscores dedication to reducing waste and conserving resources by promoting the principles of reducing consumption, reusing materials and recycling waste.

3.5.2 Processing of waste

Solid waste collected and processed at the State as well as test checked 18 ULBs during 2017-18 to 2022-23 (in ton per day) are shown in table 3.3 and 3.4 in paragraph 3.2 of the report.

It can be seen from the tables 3.3 and 3.4 that the position of processing of solid waste was marginally improved at State level from 11 *per cent* in 2017-18 to 22 *per cent* in 2022-23 of the waste collection. The position of processing of waste in 18 test checked ULBs was better than the State level position and it was ranged between 29 *per cent* and 35 *per cent* during the same period.

Further, Municipal Board, Bari reported to audit that 50 *per cent* to 70 *per cent* of waste were being processed during 2021-22 and 2022-23. However, audit noted

that Municipal Board, Bari did not have any processing facilities. Thus, the claim of processing waste was not reliable.

3.5.3 *Setting up of processing facilities in test checked ULBs*

3.5.3.1 *Non-utilisation of compost machines under SWM*

As per Rule 15(v) of Solid Waste Management Rules 2016, local authorities shall facilitate construction, operation and maintenance of solid waste processing facilities including its composting.

Director Local Bodies intimated (October 2018) all ULBs that rate contract has been accorded to M/s N K Gadhiya for procurement of various equipment including compost machines for implementation of Solid Waste Management and directed to procure machines through rate contract. LSGD also allowed (June 2019) ULBs to procure compost machines through GeM portal in accordance with provisions of RTPP Rules 2013 issued time to time from Finance Department.

Audit observed that six out of 18 test checked ULBs procured compost machines of different capacities between February 2019 and December 2019 through rate contract, GeM and open market. Out of these six ULBs, compost machinery installed in one ULB (Bhiwadi) was being used for processing of waste, in one ULB (Choti Sdari) it was burnt in June 2021 after installation and in remaining four ULBs (as detailed in *Appendix III*) compost machines were not put to use since their installation to between May 2024 and August 2024 for 57 months to 63 months due to non-providing of required training to staff by the venders; non-availability of segregated waste i.e. bio organic waste etc.

Photo of compost machines lying unutilized in Bikaner



State Government accepted (February 2025) the facts and intimated that these machines could not be utilised due to non-availability of space, quantum of segregated waste, etc.

This indicates towards lack of monitoring by ULBs to ensure working of installed compost machine which further reduced processed of waste.

3.5.3.2 Inordinate delay in setting up of Waste to energy plant

Rule 15 (v) of SWM Rules 2016 provided that it is responsibility of every ULB to construct solid waste-based power plants within two years from the date of notification of rules for processing of solid waste.

Rule 76 of RTPP Rules provided that the successful bidder should sign the procurement contract within a specified period/within fifteen days otherwise the procuring entity shall take action against the successful bidder.

Three ULBs viz Jaipur, Jodhpur and Baran had issued work orders for establishment of energy plants in 2016-17, but these have not been established as of April 2024 as discussed below:

(i) Municipal Corporation Jodhpur and Jaipur issued (March 2017 & April 2017) work orders for setting up waste to energy plant having capacity of 400 TPD and 700 TPD respectively to a firm M/s JITF Urban Infrastructure Limited with stipulated date of completion as of March/April 2019. In Jodhpur, the firm executed Power Purchase Agreement with Jodhpur Vidhyut Vitran Nigam Limited on 04 May 2022. In Jaipur, the firm executed lease agreement with Municipal Corporation Jaipur on 12 May 2022 and Power Purchase Agreement with Jaipur Vidhyut Vitran Nigam Limited on 11 July 2022 and statutory permission such as Consent to Establish from RSPCB was not obtained. Thus, these plants were not set up as of April 2024 due to delayed execution of lease agreement, power purchase agreements and non-obtaining of statutory permission such as Consent to Establish from RSPCB.

(ii) Municipal Council, Baran, invited (January 2016) tender for design, construction, O&M of processing facility for Baran and Anta towns. The Municipal Council issued (July 2017) 'Notice to Proceed' to a firm M/s Zonta Infratech Private Limited, work was to be completed up to 16 September 2018. The firm did not commence the work for establishment of the processing facility as of July 2022.

The above facts indicate that in Jaipur and Jodhpur the firms did not execute agreement due to land dispute, power purchase agreement with energy department etc.

Thus, due to inordinate delay in setting up of waste to energy plants, waste could not be processed and leading to piling up to dump unprocessed at dumping sites.

The State Government accepted that facts and stated (March 2025) that there was inordinate delay in setting up of waste to energy plants at Jaipur, Jodhpur and Baran due to several unforeseen hindrances. The major cause for delay was delay in getting environmental clearance. In Jaipur, waste to energy plant is set up and functioning and plant at Jodhpur is under process and delay is attributed to getting up Consent to Establish from RSPCB. While in Baran, the contractor did not set up the plant and agreement was terminated and necessary action as envisaged in the agreement had been taken. New work order under SBM 2.0 has been issued (December 2023) for the establishment of RDF and compost plant in Baran.

Audit further noted that in order to reduce landfill dependency and to promote sustainable waste management, waste to energy plants have been set up (i) in Ahmedabad (15 MW) by processing 1000 TPD Municipal Solid Waste into electricity for clean energy and waste reduction, (ii) a plant in Pune (14 MW) using thermal gasification technology to convert 1000 TPD waste into green energy, (iii) a bio-CNG plant in Indore under GOBARdhan scheme to convert municipal solid waste into bio-CNG and compost. These measures need to be emulated in Rajasthan also.

3.5.4 Construction and demolition waste not processed

The processing of construction and Demolition (C&D) waste is important as per C&D waste management Rule, 2016. It prevents unscientific disposal that causes air, water and soil pollution and it reduces dust, littering, and unmanaged dumping. Construction and Demolition (C&D) waste comprises of buildings materials, debris and rubble resulting from construction, repair and demolition of any civil structure. As per Rule 6 of the Construction and Demolition Waste Management Rules, 2016, it is the responsibility of the Urban Local Bodies to collect, transport, process and dispose of Construction and Demolition waste either through own resources or by appointing private operators. As per the Annexure 1 of SBM (Urban) 2.0 guidelines (effective from October 2021) seven cities⁸ having population more than five lakh or categorised under National Clean Air Programme in Rajasthan are eligible for C&D waste processing funding.

Audit observed that as per the SBM (Urban) 2.0 guidelines four (Bikaner, Jaipur, Jodhpur and Udaipur) out of 18 test checked ULBs were eligible for setting up of C&D processing plant. Only Municipal Corporation, Udaipur has set up (December 2020) one C&D waste processing plant in the State as of March 2022. This plant was also not functioning (June 2022) due to want of O&M. As a result, 6.24 lakh MT⁹ of Construction and Demolition waste generated during 2020-21 and 2022-23 in the State could not be processed. Due to non-set up of C&D waste processing plant, the C&D waste is being mixed with solid waste or disposed in low lying area.

⁸ Ajmer, Alwar, Bikaner, Jaipur, Jodhpur, Kota and Udaipur.

⁹ 2020-21: 1.65 lakh MT: 2021-22, 1.98 lakh MT and 2022-23 : 2.61 lakh MT.



Photo of idle C&D Waste plant at Udaipur and undisposed C&D waste lying undisposed in June 2022.

State Government stated (March 2025) that C&D plants at Jaipur and Udaipur are operational while plant at Jodhpur and Bikaner are under construction.

3.5.5 Non-construction of sanitary landfills

Solid Waste Management Rules, 2016 prescribes that Urban Local Bodies should set up sanitary landfill facilities in its area for disposal of residual waste. As per rule 15 (w) of SWM Rules, 2016 Urban Local Bodies have to construct, operate and maintain the sanitary landfills and associated infrastructure.

Out of 18 test checked Urban Local Bodies, 15 ULBs did not construct sanitary landfill sites and dumped the municipal solid waste in open dumping sites. Though Municipal Corporation Jaipur and Municipal Council Baran constructed landfill sites in year 2012 and 2016 respectively at a cost of ₹ 12.06 crore¹⁰ these remained unutilized since their construction due to non-setting up of processing plants as discussed in para 3.5.3.2 of the report. This resulted in Municipal Solid Waste was being dump in open dumping site. In Dungarpur, landfill was being used.

The State Government stated (March 2025) that landfill sites are utilised after setting up of processing plants and residual waste is to be landfilled. The reject from processing plants will be disposed of in sanitary landfill facility being established under SBM (Urban) 2.0. For this, 174 ULBs have been clustered and tender for establishment of sanitary landfill facility has been invited in 28 clusters.

The audit further noticed and found that out of 18 test checked ULBs, two ULBs (Pokhran and Kishangarh) have not been included in the cluster.

3.5.6 Non-closure of dumpsites

Open dumpsites pose a threat to the environment and human health. As per rule 15 (zj) and (zk) of SWM Rules 2016, ULBs shall investigate and analyse all old open dumpsites and existing operational dumpsites for their potential of bio-mining and bio-remediation¹¹ and wheresoever feasible, take necessary actions for biomining

¹⁰ Municipal Corporation, Jaipur: ₹ 10.93 crore and Municipal Council: Baran: ₹1.13 crore.

¹¹ Bio-mining and bio-remediation refer to excavation of old dump waste, make window of legacy waste, stabilisation of the waste through bio-remediation i.e. exposure of all the waste to air along with use of composting bio-culture i.e. screening of stabilised waste to recover all valuable resources (like organic fines, bricks, stones, plastics, metals, cloths, wax etc.) followed by its sustainable management through re-cycling, co-processing, road making etc.

or bio-remediate on the sites. In the absence of the potential of bio-mining and bio-remediation of dumpsite, it shall be scientifically capped as per landfill capping norms to prevent further damage to the environment.

Test check of 18 Urban Local Bodies showed that none of the ULBs planned for bio-mining and bio-remediation or undertook scientific capping of dump sites as of March 2023.

The State Government accepted the facts and stated (March 2025) that as of March 2022 no dump site was bio remedied but thereafter DLB issued work orders for bio remediation of these dump sites. It was further stated that 88 lakh cubic meters of legacy waste was estimated at 176 dumpsites out of which 63.42 lakh cubic meter waste has been remediated and 71 sites has been remediated. Work at 105 sites is under progress and likely to be completed by March 2025.

The audit further noticed and found that out of 18 test checked ULBs, in ten ULBs¹² legacy waste has not been remediated.

3.6 Conclusion

The audit has revealed discrepancies in the reporting & management of Solid Waste by ULBs. There were instances where the actual waste collection differed from reported figures. Additionally, inconsistencies were observed between data provided to audit and that reported to RSPCB. This indicates a lack of reliable monitoring mechanism. Audit observed absence of weigh bridges in 14 test checked ULBs, non-installation of RFID cards at each household for tracking collection efficiency.

Segregation of waste, a critical component of effective Solid Waste Management was not ensured in all ULBs. The capacity for processing waste remains inadequate which is leading towards ineffective SWM by ULBs.

Recommendations:

- 1. The State Government may ensure installation of weigh bridges and RFID cards in all ULBs for accurate measurement and to check collection efficiency.*
- 2. The State Government should undertake advocacy & outreach activities and Health & Sanitation Committees to ensure 100 per cent segregation of waste at secondary stage.*
- 3. The State Government may make efforts to reduce dependency on landfills by enhancing its processing capacity.*

¹² Balotara, Bhawani Mandi, Bhiwadi, Bikaner, Choti Sadri, Jaipur, Jodhpur, Pokhran, Rajgarh and Sambhar Lake.

- 4. The State Government should make material recovery facilities mandatory to divert recyclable material from landfills by increasing recycling rates and reducing waste sent to landfills.*
- 5. The State Government should ensure GPS enabled solid waste management vehicle for route optimization, real time tracking and enhanced customer services by ensuring timely waste collection.*
- 6. The State Government should take new initiative for composting and waste to energy plants in line with other cities like Indore, Ahmedabad, Pune and Gangtok.*

Chapter-IV
Monitoring and Information,
Education and Communication
Activities

Chapter – IV: Monitoring and Information, Education and Communication Activities

4.1 Monitoring in Waste Management

4.1.1 Formation of Health and Sanitation Committees

As per Section 55 (3) of Rajasthan Municipal Act (RMA) 2009, every Urban Local Body should constitute a Health and Sanitation Committee which would monitor the issues relating to sanitation and its allied matters.

In 12 out of 18 selected Urban Local Bodies, these Committees were not constituted.

The State Government accepted (March 2025) that ULBs are being governed by the Local Self Government and due to political reasons, there may be some difficulties in constitution of these Committees.

4.2 Information, Education and Communication activities

4.2.1 Non-conducting of Information, Education and Communication activities

As per para 1.4.5.13 of the MSWM manual 2016 behavioral change is vital for effective waste management. Information, Education and Communication (IEC) activities¹ are important to create public awareness and educate the public to contribute to improve Solid Waste Management. School children should be the primary targets of Information, Education and Communication campaigns, as they are major agents of societal change.

Audit observed that three ULBs (Jaipur, Udaipur and Kishangarh) conducted IEC activities during 2017-18 to 2021-22 but 12 Urban Local Bodies did not conduct

¹ These activities included print (magazines, posters, newspaper); audio–visual (radio jingles, TV ads, short films, CDs); internet, and interpersonal medium etc.

any activity during 2017-18 to 2021-22 through school children as envisaged in MSWM manual. The remaining test checked ULBs, Jodhpur conducted IEC activities only during 2019-20 to 2021-22, and Bikaner and Dungarpur only during 2021-22.

A sustained campaign² of targeted messages, relevant to the ongoing planning or implementation phase specific to each considered social group would result in bringing about a significant change in behaviour patterns.

Audit observed that out of 18 ULBs only six³ undertook audio, visual, mass communication and advocacy and outreach activities. Remaining 12 ULBs did not conduct any Information, Education and Communication activities during 2017-18 to 2021-22 despite allotment of separate funds of ₹11.99 crore to these ULBs.

State Government stated (March 2025) that ULBs have undertaken various activities under IEC and as per Utilisation Certificates these ULBs have incurred expenditure on these activities. It may happen that these ULBs failed to produce evidence to audit.

The reply is not tenable as State Government has also not provided evidence to audit that these ULBs have performed the IEC activities.

4.3 Conclusion

The audit has highlighted critical gaps in the implementation of SWM practices across the 18 test checked ULBs. In 12 out of 18 selected Urban Local Bodies, Health and Sanitation committees essential for planning and monitoring public health and sanitation activities were not constituted. Additionally, despite availability of dedicated funds 12 test checked Urban Local Bodies failed to conduct any Information, Education and Communication activities during 2017-18 to 2021-22.

² Paragraph 1.4.5.13.1 of Manual 2016.

³ ULBs Bikaner, Dungarpur, Jaipur, Jodhpur, Kishangarh and Udaipur.

Furthermore, this lack of community engagement has hampered public awareness and participation in effective Waste Management.

Recommendations:

1. All Urban Local Bodies may undertake regular Information, Education and Communication activities to raise public awareness and promote responsible behavior towards the Solid Waste Management.

JAIPUR,

The 02 December 2025



(SATISH KUMAR GARG)

Principal Accountant General

(Audit-I), Rajasthan

Countersigned



NEW DELHI,

The 04 December 2025

(K. SANJAY MURTHY)

Comptroller and Auditor General of India

APPENDICES

Appendix-I

(Refer paragraph 1.3)

Position of funds received and utilized under SWM at the State level during 2017-23

(₹ in crore)

Year	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Central Finance Commission grant	207.88	240.48	385.03	557.70	453.09	422.23	2266.41
SBM 1.0 & 2.0 grant	171.55	-	-	-	-	0.60	172.15
Total Funds received	379.43	240.48	385.03	557.70	453.09	422.83	2438.56
Utilization	379.43	240.48	385.03	557.70	453.09	422.83	2438.56

(Source: Information provided by DLB)

Appendix-II

(Refer paragraph 3.1)

Details of SLB performance indicators and benchmarks pertaining to SWM

Name of ULB	Household level coverage of SWM services	Efficiency of collection of municipal solid waste	Extent of segregation of municipal solid waste	Extent of municipal solid waste recovered	Extent of scientific disposal of municipal solid waste	Extent of cost recovery in SWM services	Efficiency in redressal of customer complaints	Efficiency in collection of SWM user charges
Benchmark (in per cent)	100	100	100	80	100	100	80	90
Udaipur	100	100	80	20	0	02	98	40
Rajgarh	99	96	99	99	96	99	96	99
Hindaun city	96	85	30	0	0	0	85	0
Baran	85	85	0	0	0	0	85	0
Deoli	100	100	0	0	0	0	0	0
Sujargarh	99	98	35	95	0	5	99	20
Bhiwadi	80	90	85	80	85	90	90	80
Bari	90	90	90	85	88	90	85	85
Choti Sadri	98	97	0	0	0	0	96	0
Sambhar Lake	95	80	85	0	0	0	80	0
Jaipur	97	90	50	50	60	10	98	10
Jodhpur	95	95	42	0	0	0	95	15
Bikaner	90	92	46	10	11	07	96	06
Pokhran	89	88	0	0	0	99	0	0
Balotara	82	100	75	75	80	0	80	0
Kishangarh	100	100	100	100	100	100	100	0
Dungarpur	100	100	100	70	70	40	95	30
Bhawani Mandi	100	100	0	0	0	0	100	0

Appendix-III

(Refer paragraph 3.5.3.1)

Details of procurement of compost machines lying unused in four test checked ULBs

Sl. No	Name of ULB	Mode of procurement of machine	Details of equipment	Date of supply/ installation of the machine	Capacity of the machine per day (in kg)	Date of physical inspection	Total months since supply/ installation to month of inspection of the machine	Quantity of waste was to be processed by the machine (in MT)	Amount paid for purchase of the machine (₹ in lakh)	Reasons for the compost machine lying unutilised
1.	Municipal Corporation, Bikaner	Rate Contract	Two compost machine of 500 and 1000 kg/day	19.06.2019	1500	07.08.2024	61	1500x61x30=2745	39.32	Not providing of required wet waste
2.	Municipal Council, Kishangarh	GeM	One compost machine 500 kg/day	01.09.2019	500	28.05.2024	57	500x56x30=840	18.09	Not imparting training
3.	Municipal Council, Hindaun City	Rate Contract	Two compost machine of 100 kg/day	19.02.2019	200	29.05.2024	63	200 x 62x30=372	13.65	Not imparting training
4.	Municipal Board, Sambhar Lake	GeM	One compost machine of 500 kg/day	17.08.2019	500	29.05.2024	57	500 x 56x30=840	16.69	Not available
Total									87.75	

Glossary

BTS	Bin Tracking System
DLB	Director Local Body
DPR	Detailed Project Report
GPS	Global Positioning System
IEC	Information Education and Communication
ISWM	Integrated Solid Waste Management
LSGD	Local Self Government Department
MSWM	Municipal Solid Waste Management
PCPD	Per Capita Per Day
RFID	Radio Frequency Identification
RMA	Rajasthan Municipal Act, 2009
RSPCB	Rajasthan State Pollution Control Board
RTPP	Rajasthan Transparency in Public Procurement Act 2013
SBM	Swachh Bharat Mission
SLB	Service Level Benchmark
SWM	Solid Waste Management
TPD	Ton Per Day
ULB	Urban Local Body

Definition

Anaerobic digestion	A controlled process involving microbial decomposition of organic matter in absence of oxygen.
Biodegradable waste	Any organic material that can be degraded by micro-organisms into simpler stable compounds.
Bio-methanation	A process which entails enzymatic decomposition of the organic matter by microbial action to produce methane rich biogas.
Combustible waste	Non-biodegradable, non-recyclable, non-reusable, non-hazardous solid waste having minimum calorific value exceeding 1500 kcal/kg and excluding chlorinated materials like plastic, wood pulp, etc.
Composting	A controlled process involving microbial decomposition of organic matter.
Co-processing	Use of non-biodegradable and non-recyclable solid waste having calorific value exceeding 1500k/cal as raw material or as a source of energy or both to replace or supplement the natural mineral resources and fossil fuels in industrial processes.
Domestic Hazardous Waste	Discarded paint drums, pesticide cans, CFL bulbs, tube lights, expired medicines, broken mercury thermometers, used batteries, used needles and syringes and contaminated gauge, etc., generated at the household level.
Door to door collection	Collection of solid waste from the doorstep of households, shops, commercial establishments, offices, institutional or any other non-residential premises and includes collection of such waste from entry gate or a designated location on the ground floor in a housing society, multi storied building or apartments, large residential, commercial or institutional complex or premises.
Dump yard/site	A land utilised by local body for disposal of solid waste without following the principles of sanitary land filling.
Incineration	An engineered process involving burning or combustion of solid waste to thermally degrade waste materials at high temperatures.
Processing	Any scientific process by which segregated solid waste is handled for the purpose of reuse, recycling or transformation into new products.
Recycling	The process of transforming segregated non-biodegradable solid waste into new material or product or as raw material for producing new products which may or may not be similar to the original products.
Sanitary waste	Wastes comprising of used diapers, sanitary towels or napkins, tampons, condoms, incontinence sheets and any other similar waste.
Secondary storage	The temporary containment of solid waste after collection at secondary waste storage depots or MRFs or bins for

	onward transportation of the waste to the processing or disposal facility.
Segregation	Sorting and separate storage of various components of solid waste namely biodegradable wastes including agriculture and dairy waste, non-biodegradable wastes including recyclable waste, non-recyclable combustible waste, sanitary waste and non-recyclable inert waste, domestic hazardous wastes, and construction and demolition wastes.
Solid waste	Includes solid or semi-solid domestic waste, sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, agriculture and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, radio-active waste generated in the area under the local authorities and other entities.
Sorting	Separating various components and categories of recyclables such as paper, plastic, cardboards, metal, glass, etc., from mixed waste as may be appropriate to facilitate recycling.
Transfer station	A facility created to receive solid waste from collection areas and transport in bulk in covered vehicles or containers to waste processing and, or disposal facilities.
Treatment	The method, technique or process designed to modify physical, chemical or biological characteristics or composition of any waste so as to reduce its volume and potential to cause harm.
Waste generator	Includes every person or group of persons, every residential premises and non-residential establishments including Indian Railways, defence establishments, which generate solid waste.
Waste picker	A person or groups of persons informally engaged in collection and recovery of reusable and recyclable solid waste from the source of waste generation the streets, bins, material recovery facilities, processing and waste disposal facilities for sale to recyclers directly or through intermediaries to earn their livelihood.

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