

CHAPTER I

Social, General and Economic Sectors (Non-PSUs)

1.1 Trend of Expenditure

The comparative position of expenditure incurred by the Government during the year 2022-23 and in the preceding two years is given in **Table 1.1**.

Table 1.1: Comparative position of expenditure

(₹ in crore)

Disbursements	2020-21	2021-22	2022-23
Revenue Expenditure			
General services	4144.19	4960.86	5405.82
Social services	2919.06	3880.00	3545.09
Economic services	3048.89	3256.05	3845.07
Grants-in-aid and contributions	1980.52	2129.97	2088.50
Total	12092.66	14226.88	14884.48
Percentage of increase of Revenue Expenditure from year 2020-21	-	17.65	23.09
Capital expenditure			
Capital outlay	1996.67	2680.93	3425.43
Loans and advances disbursed	1.61	3.87	4.31
Repayment of public debt	751.15	971.26	1227.02
Total	2749.43	3656.06	4656.76
Grand total	14842.08	17882.94	19541.24
Percentage of increase of total expenditure from year 2020-21	-	20.49	31.66

(Source: Finance Accounts of the State for the respective years)

The total expenditure of the State increased by 31.66 *per cent* from ₹ 14,842.08 crore in 2020-21 to ₹ 19,541.24 crore in 2022-23. The revenue expenditure of the State increased by 23.09 *per cent* from ₹ 12,092.66 crore in 2020-21 to ₹ 14,884.48 crore in 2022-23.

The share of revenue expenditure to total expenditure was 80 *per cent* during 2021-22, which decreased to 76 *per cent* during 2022-23 with a corresponding increase in the share of capital expenditure to 24 *per cent* of total expenditure as compared to 20 *per cent* during 2021-22.

1.2 Authority for Audit

The authority for audit by the Comptroller and Auditor General (CAG) is derived from Articles 149 and 151 of the Constitution of India. The Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971 {CAG's (DPC) Act} further reinforces this authority. The CAG conducts audit of expenditure of the departments of Government of Goa under Section 13 of the CAG's (DPC) Act. The CAG is the sole auditor in respect of 14 Autonomous Bodies which are audited under the provisions of Sections 19 and 20 of the CAG's (DPC) Act. In addition, the CAG also conducts audit of bodies/authorities which are substantially

funded by the Government, under Section 14 of the CAG's (DPC) Act. Principles and methodologies for various audits are prescribed in the Auditing Standards and the Regulations on Audit and Accounts (Amendments), 2020 issued by the CAG.

1.3 Planning and conduct of Audit

There are 65 departments in the State headed by Chief Secretary/Principal Secretaries/Secretaries. They are assisted by Directors/Commissioners and subordinate officers under them. In addition, there are 14 Autonomous Bodies, which are audited by the Accountant General, Goa.

Audit process starts with the assessment of risks faced by various departments of Government. The risks are assessed on the basis of expenditure incurred, criticality/complexity of activities, levels of delegated financial powers, internal controls, media reports and concerns of stakeholders. Previous audit findings are also considered in this exercise. Based on this risk assessment, the frequency and extent of audit is decided.

After completion of audit of each unit, Inspection Reports (IRs) containing audit findings are issued to the Heads of the departments. The departments are requested to furnish replies to audit observations within four weeks of receipt of the IRs. Whenever replies are received, audit observations are either settled or further action for compliance is advised. The important audit observations arising out of these IRs are processed for inclusion in the Audit Reports. The Audit Reports are submitted to the Governor of the State under Article 151 of the Constitution of India.

1.4 Lack of responsiveness of Government to Audit

1.4.1 *Inspection Reports outstanding*

The Accountant General (AG) arranges to conduct periodical inspections of Government departments to test-check their transactions. The AG also verifies the maintenance of important accounting and other records as per prescribed rules and procedures. These are followed up with IRs, which are issued to the Heads of the offices inspected, with copies to the next higher authorities. Half yearly reports of pending IRs are sent to the Secretaries of the concerned departments. This facilitates monitoring of the action taken on the audit observations included in these IRs.

As of June 2023, 778 IRs (3,308 paragraphs) were outstanding for want of compliance. Year-wise details of IRs and paragraphs outstanding are detailed in **Appendix 1.1**.

1.4.2 Response of Departments to the draft paragraphs

Subject Specific Compliance Audit on Solid Waste Management in Urban Local Bodies was forwarded in April 2024 to the Secretary concerned and reply was received in June 2024.

1.4.3 Follow up on Audit Reports

Timeline for follow up of Audit Reports is prescribed in the Internal Working Rules of the Public Accounts Committee of the Goa Legislative Assembly. Accordingly, the Administrative departments were required to furnish Explanatory Memoranda (EM) to the Accountant General for vetting. The EMs in respect of the paragraphs included in the Audit Reports were to be furnished to the State Legislature within three months from the date of tabling of the Audit Report.

Ten departments as detailed in **Appendix 1.2** had not submitted EMs for 15 paragraphs pertaining to Audit Reports for the years 2016-17 to 2020-21 (March 2024).

Urban Development Department

1.5 Subject Specific Compliance Audit (SSCA) of Solid Waste Management in Urban Local Bodies in Goa

Solid Waste Management (SWM) is one of the biggest challenges faced in urban India today. Inadequate management of waste can have significant adverse impact on public health and the environment.

The compliance audit of Solid Waste Management in Urban Local Bodies (ULBs) in Goa was undertaken with a view to assess whether planning for SWM in the ULBs was in conformity with the prevailing legal framework, and the municipal tasks associated with SWM was in accordance with extant Rules and Regulations. Audit also assessed the compliance to the recommendations made during the Performance Audit of Solid Waste Management conducted during the period 2017-2018 which featured in the Audit Report for the year ended March 2018.

Audit of Solid Waste Management in test-checked ULBs i.e., Corporation of the City of Panaji (CCP), the only Municipal Corporation in the State and four selected Municipal Councils (out of 13) was carried out covering the period 2017-18 to 2021-22.

Government of Goa had notified SWM policy in October 2018 and revised it in March 2024. Audit observed that as the ULBs did not prepare any plan for SWM activities in their jurisdiction, thus, the efficient management of solid waste was impacted.

Audit also observed that the ULBs could not finance expenditure on SWM activities from their own resources. They could not enhance their

own revenues through efficient collection of user charges, resulting in huge arrears. Further, there were no sanctioned posts for dedicated staff for carrying out SWM activities in the ULBs in the State.

The estimation of waste generation by the ULBs was not as per the prescribed methodology, and the waste collected was considered as the waste generated, which affected the planning for collection and treatment of waste. The SWM treatment facilities were insufficient as well as underutilized. Consequently, on an average, only 78 per cent of collected waste across 14 ULBs from 2017-18 to 2021-22 was treated, while the remaining was dumped at dumpsites without treatment. The insufficient treatment of waste also resulted in creation of new dumpsites.

The Goa State Pollution Control Board (GSPCB), responsible under the Bio-Medical Waste (BMW) Management Rules of 2016 for maintaining an inventory of occupiers and data on bio-medical waste generation, treatment, and disposal, as well as authorizing healthcare facilities (HCFs) for handling BMW, did not maintain data on HCFs and their bio-medical waste, and also did not pursue updating its HCF database with the Directorate of Health Services. The GSPCB also could not implement the e-waste Management Rules in the State and lacked comprehensive inventories for e-waste.

The total capacity of treatment facilities in ULBs was 216.70 Tonnes per Day (TPD) out of which 124.20 TPD was for wet waste and 92.50 TPD for dry waste. Shortage of capacity in treatment facilities was observed in three out of four test-checked MCs, with Margao MC being the worst affected with a five TPD plant for processing 35 TPD waste generated.

Thus, the goal of a successful solid waste management through collection of all the generated waste at source, its efficient transportation and safe processing in accordance with the principles of reduce, reuse and recycle remains to be achieved.

1.5.1 Introduction

Solid waste includes solid or semi-solid domestic waste and non-residential waste, street sweepings, bio-medical waste, e-waste, etc. Collection of all the generated waste at source, its efficient transportation and safe processing in accordance with the principles of reduce, reuse and recycle are the key elements of any successful solid waste management (SWM) strategy. Inadequate management of waste has significant negative impact on public health and environment, apart from adversely affecting the aesthetics of the surroundings.

Solid waste management is one of the biggest challenges faced in urban India. As a rapidly urbanising¹ small State with high population density, and a large floating² population, Goa faces unique challenges on this front.

1.5.2 Municipal Solid Waste Management in Goa - Role of various entities

The Department of Science and Technology and Waste Management (DST&WM) is the nodal department to manage and treat or dispose off generated wastes in the State in a safe and scientific manner. Established in 2016, the Goa Waste Management Corporation (GWMC) is tasked with the establishment and development of solid waste management facilities throughout Goa, covering both urban and rural areas. At present two SWM plants at Saligao and Cacora at cluster-level³ and facilities for treatment of specialized waste such as biomedical waste and hazardous waste are functional at State level. The Goa State Pollution Control Board (GSPCB) is responsible for enforcing solid waste management regulations across the state.

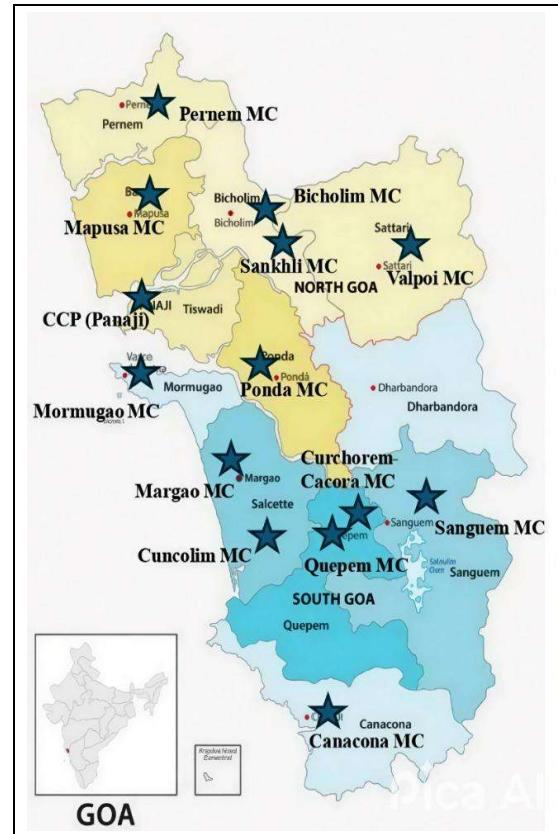


Figure 1.1: Map of ULBs in Goa

{Source: Official Gazette of GoG (1st March 2024)}

The Department of Urban Development (DUD) oversees the management of solid waste in urban areas. The Urban Local Bodies (ULBs), including the Corporation of the City of Panaji and 13 Municipal Councils (Figure 1.1), are responsible for managing solid waste within their

¹ Goa is the most urbanized State in the country with 62.20 *per cent* urban population in 2011, a significant increase since 2001, when it was 49.77 *per cent*.

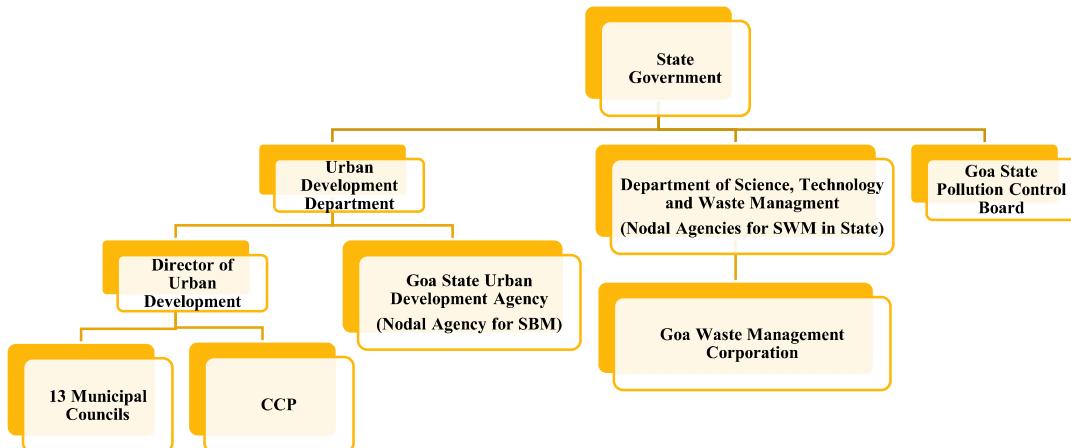
² The State's floating population fluctuated from 79.84 lakh in 2017-18 to 34.42 lakh in 2021, impacted by COVID-19. Tourist numbers rebounded to 79.61 lakh in 2022-23, while hotel counts rose from 4,399 to 5,922 over the same period. The State's floating population has always been higher than its census population.

³ Four clusters: Saligao for Pernem, Bardez, Bicholim and Sattari Taluka; Bainguinim for Tiswadi and Ponda Taluka; Cacora for Dharbandora, Sanguem, Quepem and Canacona Taluka; and Verna for Mormugao and Salcete Taluka.

respective jurisdictions. Further, the Goa State Urban Development Agency (GSUDA) serves as the nodal agency for the Swachh Bharat Mission in urban areas within the State, supporting efforts for effective waste management and cleanliness initiatives.

The hierarchy of governance for SWM is shown in **Chart-1.1**.

Chart 1.1: Hierarchy of governance for SWM



(Source: Website of Goa Government and Government Acts)

1.5.3 Regulatory framework governing waste management in the State Act for ULBs

The regulatory framework governing solid waste management activities in municipalities in Goa includes the Goa Municipality Act of 1968 and the Goa City of Panaji Corporation Act of 2002, along with the Solid Waste Management Rules, 2016 issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC). Further, the Model Sanitation Bye-laws were notified by the Urban Development Department (UDD) in October 2020.

1.5.4 Audit Framework

A performance audit on solid waste management in Goa covering the period 2013-14 to 2017-18 was conducted which featured in the Audit Report for the year ended March 2018 (Paragraph 1.5 of Report No. 2 of the year 2019). The report was placed in the Legislature in February 2020. The current audit sought to assess the compliance to recommendations of the previous Audit Report along with the objectives detailed in the succeeding paragraphs.

1.5.5 Audit Objectives

The objectives of the compliance audit were to assess whether:

- i. The strategy and planning of solid waste management in ULBs is commensurate with the waste generated and was in conformity with the prevailing legal framework;

- ii. The municipal tasks associated with solid waste management, including collection, segregation, storage, transportation, disposal of waste, and social inclusion of informal waste workers were in accordance with extant rules and regulations;
- iii. The planning, construction, commissioning, operation and maintenance of solid waste management projects in ULBs was as per requirement and was financially sustainable; and
- iv. The monitoring and evaluation of solid waste management system including awareness activities, citizen engagement, complaint redressal mechanism, and internal control was as per the mandate.

1.5.6 Audit Criteria

The major audit criteria were drawn from the provisions of:

- Solid Waste Management Rules, 2016;
- Municipal Solid Waste Management Manual⁴, 2016;
- The State Policy on Solid Waste Management, 2018; and draft policy 2022;
- Swachha Bharat Mission Guidelines, 2021;
- Model Municipal Solid Waste (Management and Handling) Bye-laws, 2020;
- Bio-medical Waste Management Rules, 2016;
- E-waste (Management) Rules, 2016;
- Plastic Waste Management Rules, 2016;
- Goa Municipal Act, 1968 and CCP Act, 2002; and
- Central Pollution Control Board (CPCB) and GSPCB guidelines (issued from time to time) and National Green Tribunal (NGT) orders and other Court orders.

1.5.7 Scope and Methodology

The subject specific compliance audit on ‘Solid Waste Management in Urban Local Bodies’ covered the period from the year 2017-18 to 2021-22. The field audit was conducted between January 2023 to June 2023. It involved examination of the records relating to SWM in the Directorate of Urban Development, five⁵ selected ULBs, Goa Waste Management Corporation, Goa State Pollution Control Board and Goa State Urban Development Agency.

The audit objectives, criteria, scope, and methodology were explained in the entry conference held with the Director of Urban Development on

⁴ Municipal Solid Waste Management Manual, 2016 prepared by Central Public Health and Environmental Engineering Organisation (CPHEEO) a technical wing of the Ministry of Housing and Urban Affairs. CPHEEO deals with the matter related to urban water supply and sanitation including solid waste management in the country.

⁵ CCP, Mapusa, Bicholim, Margao and Mormugao

04 January 2023. The audit findings, conclusions and recommendations were discussed in the exit conference held on 13 May 2024 with the Secretary (Urban Development). The Department's replies (14 June 2024) have been incorporated at appropriate places in the report.

1.5.8 Acknowledgement

Audit acknowledges the co-operation and assistance extended by the Director of Urban Development, heads of Urban Local Bodies, GSPCB, GWMC and GSUDA in conducting the audit.

Audit Findings

1.5.9 Strategy and planning of solid waste management

An assessment to ascertain whether the strategy and planning of Solid Waste Management in ULBs was commensurate with the waste generated and was concurrent with prevailing legal framework, led to the following findings.

1.5.9.1 Non-preparation of SWM Plan by ULBs

Rule 15(a) of the Solid Waste Management Rules 2016 mandates ULBs to prepare a solid waste management plan in accordance with the state policy and submit it to the respective State Government departments within six months of the policy's notification.

The SWM Policy was notified in October 2018 and revised in March 2024 by the UDD and the ULBs had to prepare SWM Plan within six months of notification of the policy. Eight⁶ ULBs replied (January 2023) that they had prepared the SWM plan, but the SWM plan approved⁷ by the respective council was not furnished to audit. Mapusa MC furnished an action plan to Audit, which was infact a status report with regard to SWM in the MC, as their SWM plan. The CCP stated that the action plan prepared by them in 2003-04 was also in line with SWM Rules, 2016 but did not furnish the same to Audit. Margao, Mormugao and Bicholim had prepared their plans in February 2023. However, Mapusa accepted (May 2023) that there was no SWM plan while Mormugao stated (June 2023) that the preparation of plan was in progress. Thus, it is evident that none of the ULBs had council approved SWM plans.

In the absence of a plan, the ULBs were unable to assess actual solid waste generation, identify optimal waste management methods, set operational targets, outline stakeholder roles under contract arrangements, or develop

⁶ CCP, Pernem, Mapusa, Bicholim, Margao, Mormugao, Canacona, and Sankhali

⁷ As per Clause 1.4.8 of Central Public Health and Environmental Engineering Organisation (CPHEEO) SWM manual 2016, the council of the ULB is to validate and adopt the SWM Plan.

guidelines for resource utilization, impacting the efficient waste management of solid waste in the ULBs.

The Department replied (June 2024) that ULBs have already been instructed to prepare their SWM plans in accordance with the SWM policy notified in March 2024 and that further directions would be issued to ULBs to ensure adherence.

1.5.9.2 Inaccurate action plan for SWM under Swachh Bharat Mission

As per Para 6.6.3 of Swachh Bharat Mission (SBM) Guidelines (October 2021), ULBs were to prepare Detailed Project Reports (DPRs) for SWM for their city in consultation with the State Government.

For SBM-U 2.0, all 14 ULBs submitted (April 2022) the city solid waste action plan⁸ in the proforma provided by WAPCOS Limited, the implementing agency appointed by Goa State Urban Development Agency⁹ (GSUDA), which compiled and prepared an action plan for all ULBs.

Audit observed that the Action plan did not depict the correct status of treatment facilities and landfill sites in the four¹⁰ test-checked ULBs. As per the plan, CCP had adequate capacity of treatment facility {34.2 Tonnes per Day (TPD) for wet waste}. However, as per the details of treatment facility for wet waste provided by CCP to Audit (February 2023), the capacity was for only 18.6 TPD. The absence of landfill site at Mormugao was not depicted in the plan and no enhancement of treatment facility was proposed for Mapusa, which was required on priority. Details of gaps are provided in **Appendix 1.3**. Thus, due to inaccurate information provided by ULBs for SBM 2.0, GSUDA did not propose the needed SWM facilities in the ULBs under SBM.

Inadequate wet waste treatment facilities were observed in the test-checked MCs of Mormugao, Margao and Mapusa. In the absence of treatment facilities, all three ULBs were sending their untreated waste to the Saligao treatment plant since January 2022 (despite the fact that Margao MC and Mormugao MC are not part of the Saligao cluster) or dumpsites in their respective municipal jurisdictions as discussed in **Paragraphs 1.5.15.2, 1.5.16.1 and 1.5.18.1**.

Absence of SWM plans in ULBs affected the efficient management of solid waste. The action plans prepared by GSUDA for SBM 2.0 were inadequate

⁸ Action Plan contains demographic and waste generation details, MSWM service level benchmarks (SLBs), current MSW management, and assessment of requirements of processing plants/facilities.

⁹ The Goa State Urban Development Agency (GSUDA) is a State Level Nodal Agency (SLNA) for implementing Swachh Bharat Mission in Goa.

¹⁰ CCP, Mapusa MC, Margao MC and Mormugao MC

due to non-depiction of correct status of treatment facilities and landfill sites, non-inclusion of proposals of enhancement of treatment facilities, etc. in the ULBs.

Recommendation 1: Urban Local Bodies may prepare their Solid Waste Management plans, encompassing both short-term and long-term objectives, on priority, in accordance with the policy.

1.5.10 Financing of SWM activities in ULBs

Rule 15(x) of the Solid Waste Management Rules, 2016 required the ULBs to allocate funds in their annual budget for both capital investments and operation and maintenance (O&M) of SWM services. Further, Rule 15(f) of Solid Waste Management Rules, 2016 stipulates the duty of ULBs to levy user fee¹¹ as deemed appropriate and collect the same from the waste generators on its own or through authorised agencies.

Audit observed that all ULBs made provisions for both capital investments and O&M activities under SWM in their annual budget. However, scrutiny of financial statements of the test-checked ULBs for the financial years 2017-18 to 2021-22 revealed that the revenue generated by ULBs for SWM by way of levy of user charges was not sufficient to meet the entire expenditure relating to SWM activities. Revenue of ULBs from SWM activities includes user charges for collection and disposal of solid waste and proceeds of sale of compost and recyclables. Audit noticed that four out of five test-checked¹² ULBs levied and collected user charges. The details of revenue receipt and expenditure under the solid waste management during the period 2017-18 to 2021-22 in five test-checked ULBs are shown below:

Table 1.2: Status of revenue generation through SWM activities vis-à-vis expenditure on SWM by the test-checked ULBs during 2017-18 to 2021-22

Year	Receipts		Expenditure		Excess of expenditure over own receipt met from Central and State Grants(+)	<i>(₹ in crore)</i>
	Own Revenue from SWM activities		Revenue	Capital		
2017-18	10.58		41.95	0.00	+31.37	
2018-19	9.57		49.55	0.01	+39.99	
2019-20	9.18		54.86	0.85	+46.53	
2020-21	5.65		53.37	0.01	+47.73	
2021-22	7.24		58.42	0.52	+51.70	
Total	42.22		258.15	1.39	+210.32	

(Source: Information furnished by the ULBs)

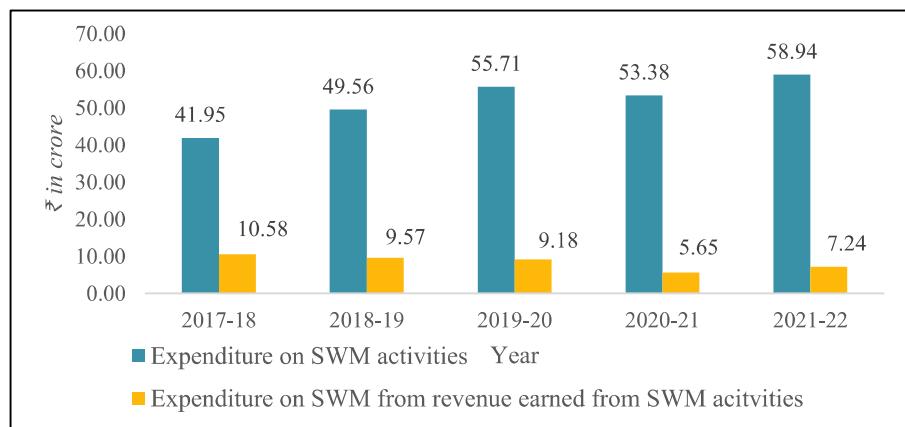
¹¹ A fee imposed by the local body and any entity mentioned in rule 2 on the waste generator to cover full or part cost of providing solid waste collection, transportation, processing and disposal services.

¹² CCP, Mapusa MC, Margao MC and Bicholim MC levied the user charges, Mormugao MC did not collect user charges.

It is seen from the above table that the revenue earned from SWM activities by the test-checked ULBs were not sufficient to cover the whole expenditure incurred by them on SWM activities.

The extent of expenditure met from own revenue generation by test-checked ULBs on SWM activities during the period 2017-22 is shown in **Chart 1.2**.

Chart 1.2: Extent of expenditure met from own revenue by test-checked ULBs on SWM activities during the period 2017-22



(Source: information provided by the test-checked ULBs)

It was thus observed that ULBs were utilizing Central¹³ and State grants to meet the excess expenditure under SWM.

Audit also observed that out of the State Government's budget for SWM activities, the DUD released SWM grants to five out of 14 ULBs, with three ULBs getting the grant twice during the period from 2017-18 to 2021-22 as shown below:

Table 1.3: Solid waste management grants by the State Government to ULBs (2017-18 to 2021-22)

Year	Budgeted	Actual allocation	Amount not released/Savings w.r.t Budget	Quantum of amount not released by the DUD (per cent)	Name of ULBs received the grant
2017-18	700	348.73	351.27	50.18	CCP, Sankhali
2018-19	700	89.05	610.95	87.28	Bicholim
2019-20	1300	104.19	1195.81	91.99	Mormugao, Valpoi
2020-21	1500	340.35	1159.65	77.31	CCP, Bicholim, Sankhali
2021-22	1000	239.86	760.14	76.01	-

(Source: Information made available by DUD)

¹³ Central Finance Commission Grants and Swachha Bharat Mission Grants.

Urban Development Department (UDD) had made provisions in the budget for SWM during the years 2017-18 to 2021-22. However, it was seen that grants were allocated to CCP, Sankhali, Bicholim, Mormugao and Valpoi MCs, depriving other ULBs of the required funds for SWM activities. It was noticed that grants were not disbursed by UDD due to non-receipt of proposal from the remaining ULBs. It was also noticed that no SWM grant was allocated to ULBs for the year 2021-22. Instead GSUDA¹⁴ was given grants of ₹ 239.86 crore for SWM. There was a huge saving (50 to 92 *per cent*) in the budget of UDD during the period for want of demand from remaining ULBs.

Director (UD) intimated (February 2024) that State grants were in the nature of additional assistance which was allotted to the ULBs in case of necessity. However, audit is of the opinion that it would facilitate better resource planning by the ULBs, if they are informed of the basis for the grant of DUD's assistance.

During the exit conference, the Secretary stated (May 2024) that the unequal allocation of grants would be reviewed by the concerned authority.

1.5.10.1 Poor collection of sanitation charges by ULBs

Audit observed that all the test-checked ULBs levied the sanitation charges (user fees) from the residential households and commercial establishments by Council resolutions and according to SWM (Management and Handling) Bye-laws 2020.

During the scrutiny of demand and collection statements of sanitation/garbage tax in the test-checked ULBs, audit observed poor collection of sanitation tax for the collection and disposal of solid waste from waste generators (including households and trade occupants) for the period 2017-22, as illustrated in the **Table 1.4**.

¹⁴ GSUDA is the State Level Nodal Agency for co-ordination, monitoring and implementation of various Centrally Sponsored Schemes (CSS) of the Ministry of Housing and Urban Affairs, Government of India in urban areas.

Table 1.4: Demand and collection of sanitation tax by four¹⁵ test-checked ULBs

Year	Demand			Collection			Closing Balance of Arrears	Per cent collection			(₹ in crore)
	Arrears	Current	Total	Arrears	Current	Total		Arrears	Current	Total	
2017-18	7.19	10.78	17.97	2.84	6.80	9.64	8.33	39	63	54	
2018-19	8.43*	11.13	19.56	2.09	6.48	8.57	10.99	25	58	44	
2019-20	10.99	11.36	22.35	1.70	6.42	8.12	14.23	15	57	36	
2020-21	14.22*	11.87	26.09	1.85	6.43	8.28	17.81	13	54	32	
2021-22	17.89*	14.34	32.23	2.81	8.37	11.18	21.05	16	58	35	

(Source: Information made available by ULBs)

*The CB of the preceding year and OB of the succeeding year differ due to remission/waiver of charges allowed by ULBs.

As evident from the table above, the test-checked ULBs managed to collect only between 32 to 54 per cent of the total demand (sanitation tax) up to the fiscal year 2021-22. Notably, the collection of current demand decreased from 63 to 58 per cent during the period under review. The collection of arrears also experienced a decline, dropping from 39 to 16 per cent over the same period. The ULBs did not demonstrate adequate effort in collecting arrears of sanitation charges over the given period.

The Department replied (June 2024) that necessary directions would be issued to ULBs to assess and address the shortcomings in effective collection of user charges from the waste generators.

1.5.11 Adequacy of manpower in ULBs for SWM

As per the SWM Manual Part II, Para 1.4.5.4, it is recommended that ULBs establish an SWM cell or SWM department, with dedicated staff such as experienced junior engineer, qualified sanitary officer, sanitary inspector and supervisor for towns below one lakh population, equipped with technical and managerial skills specific to Municipal Solid Waste Management, to ensure the development of an efficient and advanced MSWM system.

Audit observed that during the audit period, only six¹⁶ out of 14 ULBs had formed SWM cells. This lack of establishment was further compounded by the absence of provisions in State Acts¹⁷ and Rules¹⁸ for recruiting qualified personnel such as junior engineers, supervisors, and inspectors for efficient SWM in the ULBs. Consequently, ULBs deployed available

¹⁵ CCP, Margao, Mapusa and Bicholim. Mormugao did not collect user charges.

¹⁶ Cuncolim, Quepem, Margao, CCP, Mormugao and Canacona

¹⁷ GMA, 1968 and CCP Act, 2002

¹⁸ Goa Municipalities (Common Cadre of Municipal Engineers) Recruitment Rules, 2006

municipal engineers, inspectors, and supervisors for SWM activities. The status of staff availability for SWM activities is given in **Table 1.5**.

Table 1.5: Availability of manpower for SWM activities in ULBs

Sl. No.	Posts	No. of ULBs that deployed staff	No. of ULBs that did not deploy
1	Engineer	12	02
2	Sanitary Officer/Inspector	11	03
3	Supervisor	14	-
4	Municipal workers	14	-

(Source: data furnished by the ULBs)

It may be seen from the above tables that two¹⁹ ULBs lacked dedicated engineers, while three²⁰ ULBs lacked inspectors for supervision of MSW activities. Thus, the staffing arrangement was ad hoc, due to the non-inclusion of specific cadres in the recruitment rules and dedicated sanctioned strength.

Acknowledging audit's recommendation, the Department stated (June 2024) that the matter would be placed before higher authorities for decision to be made regarding the provisions of dedicated staff for SWM after assessment of ULB's requirements. Also, it was stated that necessary directions would be issued to the ULBs to establish SWM Cells.

The ULBs could not finance SWM expenditure through their own resources and could not enhance their own revenues through efficient collection of user charges. There were no sanctioned posts for dedicated staff for SWM activities in ULBs in the State.

Recommendation 2: Urban Local Bodies may make concerted efforts to improve the collection of user charges for management of solid waste in their jurisdiction.

Recommendation 3: The State Government may make provision in State rules for dedicated qualified staff for Urban Local Bodies for the Solid Waste Management activities.

1.5.12 Solid waste processes in ULBs

Audit sought to assess whether the municipal tasks associated with SWM including collection, segregation, storage, transportation, disposal of waste, and social inclusion of informal waste workers were effective, efficient and economical. The process of solid waste management is depicted in **Figure 1.2**.

¹⁹ Mapusa and Sanguem

²⁰ Pernem, Margao and Sanguem

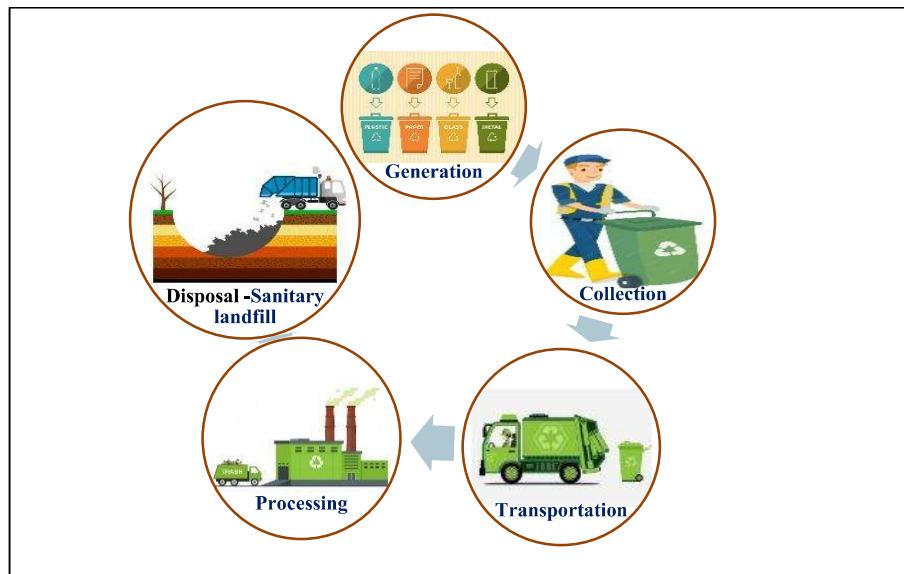
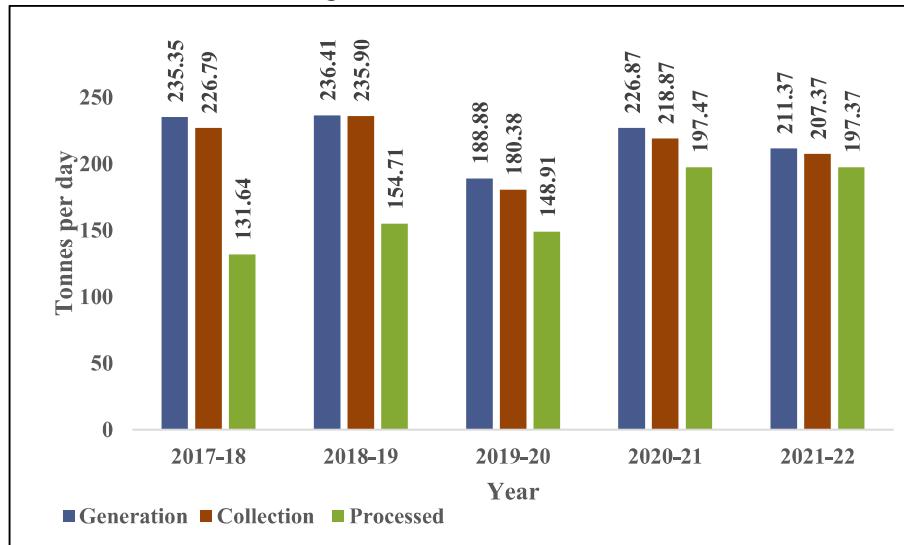


Figure 1.2: Process of SWM

Households and commercial establishments produce both dry and wet waste, which is collected by the municipalities. This waste is then transported to waste processing areas within municipalities or centralized waste treatment plants for segregation and disposal. Wet, biodegradable waste undergoes composting, while recyclable dry waste is sold. Non-recyclable dry waste with high calorific value is sent to cement factories for co-incineration as Refuse Derived Fuel (RDF). The remaining non-recyclable waste is disposed off in landfill sites.

Following are the details of generation, collection and processing of waste in ULBs as per the annual report published by GSPCB for the period 2017-22:

Chart 1.3: Details of generation, collection & processing of waste in ULBs during 2017-22



(Source: Data made available by GSPCB)

1.5.13 Generation and collection of waste

1.5.13.1 Waste generation and its collection in ULBs

1.5.13.1 (a) Incorrect assessment of generation of waste by ULBs

According to Clause 1.4.3.3 of the Solid Waste Management Manual, ULBs are to assess waste quantity and composition of the waste generated to design effective SWM systems conducting surveys and measurement at the point of generation using the prescribed data collection formats. The waste quantification was to be done for the long-term²¹ and short-term²² planning. The quantification of waste for long-term is required to be repeated once every three to five years at the time of review of the plan.

Audit observed (April 2023) that ULBs were not quantifying the generation of waste by following the prescribed methodology. ULBs quantified collected waste which reached the Material Recovery Facility (MRF) having weigh bridges, as the waste generated. Uncollected waste was thus left unquantified. As per the *Waste Characterization Report*²³, the estimated generation of waste for the year 2018 was 267.90 TPD and as per ULB data given to audit, it was 218.01 TPD. Thus, a gap of 49.89 TPD was observed for waste generation for the year 2018, as illustrated in **Appendix 1.4**. Out of 14 ULBs, there was no variation in waste generation data over the years from 2018-19 to 2021-22 reported by five ULBs²⁴, while other five ULBs²⁵ indicated a decrease in waste generation within their jurisdictions. This static or decreased waste generation reported by the 10 ULBs is incongruent with the expected increase in waste generation due to urban growth, population increase, and evolving lifestyle patterns and indicates inaccurate quantification of waste generation within these ULBs.

²¹ For long-term planning, estimate the average waste disposal by a specific generator class by continuously sampling for seven days across multiple locations within the ULB during summer, winter, and rainy seasons. Aggregate, weigh, and average the waste over this period, then extrapolate the data to the entire ULB to assess per capita generation.

²² For short-term planning, the waste generation is quantified by selecting 100 sampling locations per 1,00,000 population, covering diverse groups such as households, commercial establishments, institutional generators, hospitals and health care establishments, etc. by distributing storage bags for three to seven days and advising the procedure for daily waste deposits. The waste is collected, weighed, and recorded by category, then segregate and weigh components; and extrapolate this data to determine per capita waste generation rates for the entire ULB.

²³ On comparison with waste generation data outlined in the *Waste Characterization Report* prepared by iDek, the consultant appointed by GWMC for preparation of SWM policy in 2018.

²⁴ Pernem, Quepem, Sankhali, Sanguem and Valpoi

²⁵ Bicholim, Canacona, Curchorem-Cacora, Margao and Ponda

The Director (UD) accepted (December 2023) audit observation and assured that directions would be issued to the ULBs to undertake necessary measures for waste quantification.

Inaccurate estimation of the quantum of waste generation affected the preparation of appropriate plans for the collection and treatment of waste by the ULBs. This in turn was responsible for incomplete waste collection and treatment and the creation of waste dumps and to a certain extent littering as discussed subsequently.

1.5.13.1 (b) *Gaps in generation and collection*

In accordance with Section 1.4.5.10 of the MSWM Manual (2016), door-to-door collection of segregated waste is mandated, while underscoring the importance of consistent and dependable service. Section 1.4.2 (Table 1.3) of the MSWM envisages service level benchmark for efficiency of MSW collection and ULB should collect 100 *per cent* of total waste generated in ULBs. Further, ULBs are required to submit annual reports to the GSPCB regarding SWM as per the Rule 24(2) of the SWM Rules, 2016.

Disparities between waste generation and collection within ULB jurisdictions, as evidenced by both GSPCB data and audit findings (2.69 *per cent* and 1.81 *per cent*, respectively) are depicted in **Table 1.6**.

Table 1.6: Gaps in generation and collection

(in TPD)

Year (As on 31 March every year)	As per Annual Report submitted by ULBs to GSPCB			As per reply of Audit Requisition made by ULBs		
	Generation	Collection	Uncollected (<i>per cent</i>)	Generation	Collection	Uncollected (<i>per cent</i>)
2017-18	235.35	226.79	3.64	228.81	220.40	3.68
2018-19	236.41	235.90	0.21	218.01	213.60	2.02
2019-20	188.88	180.38	4.50	197.31	194.90	1.22
2020-21	226.87	218.87	3.53	202.11	199.70	1.19
2021-22	211.37	207.37	1.89	206.31	204.90	0.68
Average	219.77	213.86	2.69	210.51	206.70	1.81

(Source: Data furnished by GSPCB and ULBs)

Audit observed that 12 out of 14 ULBs reported waste generation equalling collection for the past five years, except for CCP and Sanguem MC. Since the prescribed methodology was not used for quantification of waste generated as discussed in **Paragraph 1.5.13.1(a)**, it cannot be stated that the generation and collection of waste were equal. Further, five²⁶ ULBs lacked weighbridge facilities, with three²⁷ of them installed in 2022 at the waste treatment facilities. They quantified transported waste as collected, leaving un-transported waste unquantified. Further, declining trend of waste generation from 235.35 TPD in 2017-18 to 211.37 TPD in

²⁶ Sanguem, Pernem, Canacona, Mapusa and Curchorem-Cacora

²⁷ Quepem, Ponda and Mormugao

2021-22 is not in line with the fact that the population in ULBs grew from 4,35,421 to 4,73,436 for the years 2018²⁸ and 2021²⁹ respectively.

Observing that 96 *per cent* of the generated waste was being collected, the Audit Report for the year ended March 2018 recommended that the State Government should strengthen its collection system to ensure the complete retrieval of waste at source. During the current audit, the ULBs stated that total collection as against generated waste increased to 98 *per cent* as against the target of 100 *per cent* door-to-door collection. However, as pointed out *{Paragraph 1.5.13.1 (a)}*, the method for quantification of waste was inaccurate and as such, the claim of 98 *per cent* waste being collected is unreliable, as evident in the pictures below:

	
<p><i>Figure 1.3: Littering in CCP (01/03/2023)</i></p>	<p><i>Figure 1.4: Littering in Mapusa MC (14/03/2023)</i></p>
	
<p><i>Figure 1.5: Littering at Mormugao (24/03/2023)</i></p>	<p><i>Figure 1.6: Dump at Mormugao MC (24/03/2023)</i></p>

As seen in the pictures above, littering and black spots were observed in all test-checked ULBs. Also, from the dumpsites seen in Margao, Mormugao and Mapusa MCs, it is evident that the collection of the generated waste was less than the target fixed under Service Level Benchmark (100 *per cent*).

In response, the Director (UD) stated (December 2023) that many ULBs shared boundaries with one or more village panchayats, and residents from these panchayats were dumping waste en route to the city, leading to littering issues.

²⁸ Population mentioned in the Waste Characterization Report of GWMC.

²⁹ City solid waste action plan of GSUDA.

The reply is not tenable as ULBs are responsible for taking action, like imposing spot fines and penalties for littering and unscientific disposal of waste, as per Clause 10 of Sanitation Bye-laws. ULBs should strengthen the collection system and treatment of collected waste to stop littering, promptly clear littered waste, and prevent the creation of dumpsites in their jurisdictions.

During the exit conference, the Secretary (UD) directed (May 2024) that an advisory be issued to ULBs regarding the need for accurate quantification of waste.

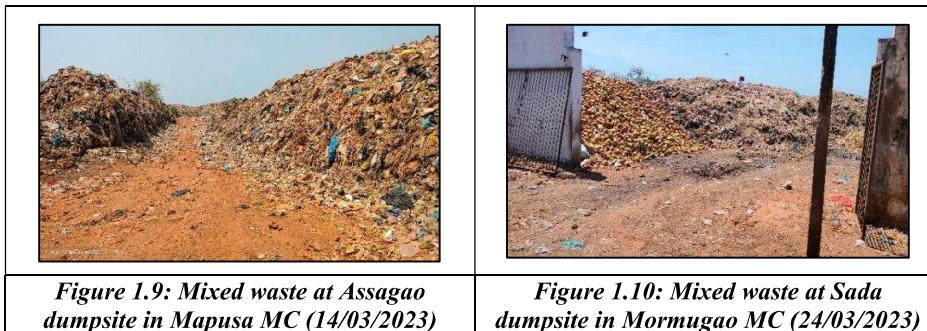
1.5.13.2 Non-segregation of waste at source

Rule 4 of SWM Rules, 2016 mandates waste generators to segregate waste into three streams: bio-degradable, non-biodegradable, and domestic hazardous waste, utilizing appropriate bins. This source segregation practice minimizes contamination, thereby facilitating easier collection, transportation, and subsequent processing of waste. ULBs were obligated to ensure 100 *per cent* segregation of waste by generators in their jurisdiction as per the service level benchmarking³⁰ (SLB).

In response to audit enquiry, the ULBs reported that they collected an average of 96.71 *per cent* of segregated waste from residential and non-residential premises in 2021-22 as shown in **Appendix 1.5**. However, all the ULBs declared achievement of SLB in their respective action plan ranging from 40 to 80 *per cent* (average 66 *per cent*) for SBM 2.0. This discrepancy of data relating to collection of segregated waste indicates that the ULBs' claims in response to the audit query did not match with SLB data as per action plan. This was substantiated with the fact that during joint site inspection, mixed waste was found at Material Recovery Facilities (MRFs) and dumpsites in Margao, Mapusa, Bicholim and Mormugao MCs respectively as depicted below:

	
Figure 1.7: Mixed waste at MRF in Margao MC (28/02/2023)	Figure 1.8: Mixed waste at treatment plant in Bicholim MC (10/03/2023)

³⁰ City Solid Waste Action Plan prepared by GSUDA for the year 2021.



Ensuring 100 per cent waste segregation at the source by ULBs is crucial to prevent mixed waste from reaching MRFs and transfer stations, thereby making processing and handling more manageable and cost-effective.

During the exit conference, the Secretary (UD) directed (May 2024) necessary instructions to be issued to ULBs to create awareness among citizens for ensuring waste segregation at source.

1.5.14 Unscientific transportation of waste in ULBs

Rule 3(52) of the SWM Rules, 2016 defines transportation as “means for conveyance of solid waste, either treated, partly treated or untreated from a location to another location in an environmentally sound manner through specially designed and covered transport system so as to prevent the foul odour, littering and unsightly conditions”. Additionally, Clause 8(2) of Bye-laws 2020, mandates waste collection vehicles to secure garbage and have leachate collection system³¹ for wet waste to avoid overflow or spillage. This would ensure safe and proper transportation of wet waste, while minimizing environmental hazards and upholding public health standards.

The status of different vehicles used in test-checked ULBs was as follows:

Table 1.7: Status of Vehicles used in test-checked ULBs

ULBs	Vehicles used for wet waste	Wet waste collection vehicles with leachate collection system	Vehicle for dry waste	Covered dry waste collection vehicles
CCP	6	6	26	14
Mapusa	6	6	8	8
Bicholim	6	0	5	1
Margao	9	7	9	0
Mormugao	7	6	6	6
Total	34	25	54	29

(Source: Information furnished by the test-checked ULBs)

It was found that out of 34 vehicles used for transporting wet waste, only 25 had leachate collection system, while only 29 out of 54 vehicles for dry waste were covered. Temporary arrangements like covering dry waste with

³¹ Tanks attached to the vehicle transporting wet waste for collection of the liquid (leachate) that seeps through to avoid spilling on the way.

tarpaulin and using tipper trucks with Fibreglass Reinforced Plastics³² (FRP) coating for wet waste to prevent leachate leakage were being employed.

The Director (UD) replied (December 2023) that the waste was covered with tarpaulin, and for vehicles lacking leachate collection system, wet waste was transported with 240 litres plastic bins loaded onto the vehicles. While noting the reply, audit is of the view that these were temporary arrangements, difficult to ensure strict compliance on the ground and were not in line with SWM rules.

1.5.15 Processing of waste

As per the SWM Rules, 2016 processing of waste entails the scientific handling of segregated solid waste for reuse, recycling, or transformation into new products. Bio-degradable waste should undergo composting, vermi-composting, aerobic digestion, or other suitable biological processes, whereas non-biodegradable waste is to be processed through recycling or co-processing methods.

In Goa, ULBs have been treating their wet waste through composting and bio-methanation. Dry waste is sorted into recyclables³³ and non-recyclables³⁴ at MRFs or sent to the Hindustan Waste Treatment Plant in Saligao for processing.

1.5.15.1 Gaps in treatment of solid waste in ULBs

As per the annual report of SWM compiled by GSPCB based on data provided by ULBs, the status of waste collected and processed in Goa is given below:

Table 1.8: Gaps in collection and treatment of waste in all the ULBs
(in TPD)

Year	Collection	Treatment	Untreated Waste	Percentage of treatment
2017-18	226.79	131.64	95.15	58
2018-19	235.90	154.71	81.19	66
2019-20	180.38	148.91	31.47	83
2020-21	218.87	197.47	21.40	90
2021-22	207.37	197.37	10.00	95
Average	213.86	166.02	47.84	78

(Source: Data provided by GSPCB)

³² FRP Coatings & Linings (Fibreglass Reinforced Plastics), is a superior coating and lining system formed by thermosetting resins and fiberglass to raise durability and safety by lining inside of piping systems chemical storage tanks, cooling towers, and other types of industrial process equipment.

³³ Recyclables are sold by the agencies appointed for handling waste at the MRFs.

³⁴ Non-recyclables are sent to cement factories in Karnataka as refuse-derived fuel (RDF) for co-incineration.

Although the data provided shows increase in treatment of waste over the years, only 78 *per cent* on an average of collected waste across 14 ULBs from 2017-18 to 2021-22 was treated, while the remaining 22 *per cent* of collected waste was dumped at dumpsites without treatment.

In response, the Director (UD) stated (December 2023) that the ULBs had sufficient capacity for waste treatment facilities for both wet and dry waste, and all collected waste was treated scientifically. The Director also assured that the Department would take all necessary steps and issue directives to the local bodies to ensure there was no gap between the generation and disposal of waste.

The reply regarding availability of sufficient capacity is not tenable as insufficient wet waste treatment facilities were observed in test-checked ULBs. Besides, audit observed that the available waste treatment capacity of plants in test-checked ULBs remained underutilized as discussed in **Paragraph 1.5.15.2**.

1.5.15.2 Availability of plants for treatment of solid waste of ULBs

As per the revised SWM Policy 2023, solid waste treatment and disposal systems should be designed and developed to accommodate stream-wise collection of solid waste and its appropriate processing and disposal at various levels, including the generator level, ULB level, cluster level, and regional level.

GWMC had proposed (July 2017) SWM plants in four clusters³⁵. Out of the proposed four plants, only two plants have been established and made operational. Saligao plant (with capacity of 250 TPD) has been operational since 2016, while the Cacora plant commenced operations (100 TPD) in February 2024. Verna and Bainguinim plants were still in the planning phase. The status of installed and proposed SWM plants in Goa is given in **Appendix 1.6**.

It was observed that the total capacity of treatment facilities in ULBs was 216.70 TPD, out of which 124.20 TPD was for wet waste and 92.50 TPD for dry waste (till 2021-22). As per information provided by ULBs, 10 out of 14 ULBs had composting units and 12 ULBs had bio-methanation plants with capacity ranging from 0.50 TPD to 5.60 TPD for treatment of wet waste. There were no composting units in four³⁶ ULBs and no bio-methanation units in two³⁷ ULBs.

The status of utilization of waste treatment facilities in test-checked ULBs and Saligao waste treatment plant are detailed in **Table 1.9**.

³⁵ Saligao, Cacora, Bainguinim and Verna

³⁶ Pernem, Bicholim, Sanguem and Canacona

³⁷ Sankhali and Mormugao (non-functional)

Table 1.9: Status of Utilization of Solid Waste treatment facilities (Plants) in test-checked ULBs and SWMF, Saligao as of December 2022

Name of ULBs/ Integrated facility	Waste collection	Facility type	Capacity of facility	Average treatment for the calendar year 2022	(in TPD)
					Under- utilisation w.r.t. capacity
Mapusa MC	10 (dry)	Material Recovery Facility (Dry waste)	10	1.21	8.79
	14 (wet)	Bio-methanation plant for wet waste	5	3.42	1.58
Bicholim MC	2.50 (dry)	Material Recovery Facility (Dry waste)	5	3.55	1.45
	4 (wet)	Bio-methanation plant for wet waste	5	1.00	4.00
Margao MC	35 (wet)	Bio-methanation plant for wet waste	5	2.44	2.56
CCP	28.50 (wet)	Compost/Bio-Methanation plant for wet waste	17.50	8.55	8.95
SWMF, Saligao	-	Integrated facility for dry and wet waste	250-300	191.50	108.50

(Source: Data provided by test-checked ULBs and GWMC)

*Note: Mormugao MC did not provide data of waste treatment

It may be seen from the above table that the capacity of wet waste treatment plants in Mapusa, Margao and CCP was less than the collection of wet waste. Audit observed that Mapusa MC planned for 10 TPD (two units of 5 TPD each) bio-methanation plants for wet waste, but only one unit of 5 TPD was installed. Available plants were also not utilized completely by four out of five test-checked ULBs *i.e.*, Mapusa, Margao, Bicholim and CCP. They were sending some untreated wet waste to SWMF Saligao (35.16 TPD³⁸) and the rest (45.94 TPD³⁹) was dumped at the dumpsite. SWMF, Saligao was treating only 191.50 TPD, although its capacity was 300 TPD. Reasons for non-utilisation of available capacity in the ULBs as well as for not sending the untreated waste to Saligao plant were not furnished to Audit.

Plastic waste, which constituted a significant portion⁴⁰ (37 *per cent*) of solid waste, was transported to Material Recovery Facilities (MRFs). It was sorted into recyclables and non-recyclables at MRFs. The recyclable waste was disposed through recyclers, where the non-recyclable waste was baled and sent to the cement plant for co-incineration purposes. It is, however, observed (**Table 1.9**) that despite adequate capacity of MRF

³⁸ CCP-17.15 TPD, Mapusa-0.34 TPD, Margao-8.14 TPD and Mormugao-9.53 TPD

³⁹ Untreated waste at CCP-2.81 TPD, Mapusa-10.24 TPD, Margao-24.42 TPD and Mormugao-8.47 TPD for the month of March 2023.

⁴⁰ 29,440.90 TPA (80.66 TPD) as per Annual Report for the year 2020-21 submitted by GSPCB to CPCB which is 37 *per cent* of collected waste of 218.87 TPD in 2020-21 (**Table 1.8**).

plant for dry waste in Mapusa and Bicholim MCs, both plants were under utilized.

It was informed by the MD, GWMC (May 2024) in the exit conference that the SWMF, Saligao was being fully utilized since December 2023. However, the Secretary (UD) directed GWMC to assess the generation of waste in the State and look into the need for another central facility.

The status of utilisation of Saligao SWM facility as assessed (August 2024) and found that average utilisation had increased to 248.63 TPD during the period from December 2023 to July 2024 as against a maximum capacity of 300 TPD. Hence, it can be stated that the Saligao plant was still not being completely utilised for the treatment of waste.

1.5.15.3 Identification of Bulk Waste Generators (BWGs) and providing assistance for in-house treatment of wet waste

The guidelines on BWG (November 2017) emphasized the processing, treatment, and disposal of bio-degradable waste from bulk waste generators⁴¹ through composting or bio-methanation within their premises, aiming to reduce wet waste at the source. Additionally, it recommended (Para 2.4 of the guidelines) that ULBs extend all necessary technical support and guidance, except financial assistance to BWGs to establish decentralized waste management facilities.

Audit observed that while the five⁴² test-checked ULBs had identified 193 BWGs within their council jurisdiction, they failed to provide technical support and guidance for in-house wet waste treatment as prescribed in the guidelines. Bicholim, Margao and Mormugao MCs did not actively encourage the BWGs to install processing units, while CCP and Mapusa MC provided financial assistance to BWGs in lieu of technical support. Mapusa MC provided bio-gas plants to three BWGs, each costing ₹ 12.72 lakh, out of which two were non-functional. On the other hand, CCP installed bio-gas generators in municipal areas for BWGs.

In the exit conference, the Secretary (UD) instructed (May 2024) that the grounds for financial assistance to the BWGs should be identified and necessary action be taken to ensure compliance with BWG guidelines.

There were gaps between the amount of waste generated, collected and treated by the ULBs. The estimation of waste generation by the ULBs was not as per the prescribed methodology, and the waste collected was

⁴¹ As per the MSW (Management and Handling) Bye-laws, 2020 “Bulk Waste Generator” means any person having an average wet waste generation rate exceeding 25 kilograms per day or 1,000 kilograms of garden or horticulture waste per month and includes owner and occupier of house/flat, housing society, restaurant, hotel, market, industrial estate etc.

⁴² Bicholim (6 BWGs), CCP (72 BWGs), Margao (60 BWGs), Mapusa (5 BWGs) and Mormugao (50 BWGs)

considered as the waste generated, which affected the planning for collection and treatment of waste. Further, waste was not fully segregated at the source, and the ULBs also lacked appropriate vehicles for its transportation. SWM treatment facilities were insufficient as well as underutilized. Bulk Waste Generators (BWGs), while identified in all five test-checked ULBs, were not provided technical support and guidance by three test-checked ULBs to carry out in-house wet waste treatment.

Recommendation 4: Bulk waste generators may be encouraged to treat their wet waste in-house to alleviate the burden of waste treatment on Urban Local Bodies.

Recommendation 5: Efforts may be made to minimize gaps in waste generation, collection and treatment with complete segregation at source and mandated transportation of waste by Urban Local Bodies.

1.5.16 Disposal of waste at dumpsites

Accumulation of untreated waste results in the formation of dumps and contamination of soil and ground water due to the formation of leachate. As per Rule 15 (zh, zj, and zk) of the SWM Rules, 2016, it is the responsibility of ULBs to cease landfilling or dumping of mixed waste immediately after the specified timeline had elapsed for setting up and operationalizing sanitary landfills as outlined in Rule 22. ULBs are also tasked with investigating and analyzing all old open dumpsites and existing operational dumpsites to determine their potential for bio-mining and bio-remediation and take suitable action wherever feasible. In cases where bio-mining or bio-remediation was not feasible, the dumpsite should be scientifically capped according to landfill capping norms to prevent further environmental damage. Rule 22 further stipulates that dumpsites should be remediated or capped within five years after the notification of the SWM Rules, 2016.

1.5.16.1 Insufficient treatment of waste resulting in creation of dumpsites and delay in remediation of old dumpsites

The GWMC floated (August 2019) a tender for remediating legacy waste dumps across 11 locations⁴³ in ULBs, requiring a minimum quantity of 4.70 lakh cubic meters (m³) of waste to be treated. Remediation work was assigned to various contractors: M/s Hindustan Waste Treatment Pvt. Ltd. for Sonsoddo, M/s Saurashtra Enviro Projects Pvt. Ltd. for Assagao in Mapusa, and M/s CAM Industrial Services for nine small sites in November 2019. The deadline for completion of remediation work was set for February 2023, with Refuse Derived Fuel (RDF) disposal to be

⁴³ 1. Curca, 2. Campal, 3. Behind SBI, Patto, 4. Near Divja Circle (All four are in CCP), 5. Sonsoddo (Margao MC), 6. Mapusa MC, 7. Sada, Mormugao MC, 8. Bicholim MC, 9. Pernem MC, 10. Canacona MC and 11. Cuncolim MC

completed by December 2024. The status of remediation and clearing the sites is given below:

Table 1.10: Status of closing of dumpsites in ULBs

Sl. No.	Name of ULBs	Name of dump sites	Status of work
1	CCP	Four sites; Campal; Patto; Divja Circle and Curca	Work was completed at Campal (February 2021), Patto (June 2021) and Divja Circle (June 2021). Remediation work at Curca was completed (May 2023) but RDF is not disposed.
2	Mapusa MC	Assagao	Work was completed (June 2022)
3	Mormugao MC	Sada	Remediation work completed at Sada (June 2020), Cuncolim (May 2022), Pernem (December 2022), Sonsoddo (March 2023), Canacona (May 2023), and Bicholim (March 2023); but RDF was not disposed.
4	Cuncolim MC	Cuncolim IDC	
5	Pernem MC	Pernem	
6	Margao MC	Sonsoddo	
7	Canacona MC	Dumane	
8	Bicholim MC	Lakheram	

(Source: Data furnished by GWMC till August 2024)

It may be seen from the above table that the remediation work and disposal of RDF and inert material was completed at four sites. In seven sites, the remediation work was completed but the disposal of RDF and inert material was pending. It was observed that even after four years of completion of the remediation work in June 2020, RDF was not disposed off in Sada, Mormugao till August 2024.

GWMC replied (May 2023) that as per the tender conditions, the contractor has time till January 2025 for disposal of RDF. The reply is not tenable as the RDF was kept at seven sites (August 2024) even after completion of remediation work. Undisposed unbaled RDF kept at the site tends to spread across the area and poses threat to the environment, while also being a major health hazard to citizens.

Even as the work of remediation was in progress, Audit noticed (March 2023) that three new dumpsites were created in three⁴⁴ MCs out of five test-checked ULBs. During audit, it was noticed that seven⁴⁵ fire incidents occurred in three ULBs out of five test-checked ULBs due to accumulation of organic waste and passing of high tension wire through the dump sites. The status of dumpsites has been discussed in succeeding paragraphs:

⁴⁴ Sonsoddo (Margao), Assagao (Mapusa) and Sada (Mormugao)

⁴⁵ Three incidents in Margao MC, two in CCP and two in Mormugao MC.

1.5.16.1 (a) Sada dump site under Mormugao MC

As per the Audit Report for the year ended March 2018, the rehabilitation of the live dumpsite at Sada was halted due to the Mormugao Municipal Council's failure to provide an alternative site to accommodate inert residual or rehabilitated waste.



Figure 1.11: Sada dumpsite, Mormugao MC (24/03/2023)

Further, between November 2015 and March 2018, an average of approximately 28 tonnes of waste was added daily. By November 2018, the dump had reached a height of 10 meters, containing 40,324 tonnes of waste.

Audit observed (March 2023) that although a site for the accommodation of rehabilitated waste was provided and further remediation was carried out by the GWMC for 96,530 cubic meters of dumped waste in June 2020, the inert and Refuse Derived Fuel (RDF) was not fully cleared from the Sada site (August 2024). Additionally, new waste continued to be dumped at the treatment site due to insufficient⁴⁶ treatment facilities creating a new dump at the site. Frequent fire incidents were reported in the new dumpsite. It was also observed that dry waste was spreading towards the seaside.

1.5.16.1 (b) Dump at Sonsoddo, Margao

As per the Audit Report for the year ended March 2018, the Sonsoddo dump had reached (November 2018) an alarming 1,00,000 tonnes, standing at 16.50 meters vertically, with a daily addition of 20-25 tonnes. The Margao Municipal Council had temporarily covered the dump with plastic, which deteriorated over time.

During the current audit, it was observed that the remediation work for the dump, initially contracted to M/s Sociedade de Fomento Industrial Pvt. Ltd. in February 2010, was halted when the contract was terminated in August 2019. The responsibility was then transferred to GWMC in August 2019, with an expected completion date of February 2023. However, as of March 2023, the dump remained largely un-rehabilitated, with waste still being dumped at the adjacent shed. The shed was filled with a mixture of old and new waste, while a substantial pile of RDF stood at approximately six to seven meters above the ground. Located next to the city along a

⁴⁶ Mormugao MC had only 5 TPD Bio-methanation plant for treatment of wet waste and 10 TPD MRF for dry waste which was insufficient to treat 30 TPD collected waste in the council. Also, the bio-methanation plant is non-operational since May 2021.

main road on a slope, the site posed risks of the leachate flowing towards the road and nearby dwellings, contaminating ground water, besides emitting foul smell and being an eyesore to passersby.



Figure 1.12: Margao MC: new dump (28/02/2023)

Figure 1.13: Margao MC: old dump (28/02/2023)

1.5.16.2 Non-inclusion of Self-Help Groups and waste pickers

The SWM Rules, 2016 stress the importance of ULBs in establishing a system to form Self-Help Groups (SHGs) and recognizing organizations of waste pickers, integrating them into waste management systems, including door-to-door collection. Additionally, the Rules highlight the Government's responsibility to develop State policies and strategies, acknowledging the vital role played by the informal sector, including waste pickers, collectors, and recyclers in waste reduction efforts. Further, the Government is to initiate a scheme for the registration of waste pickers and dealers to ensure their formal integration into the waste management framework.

Good Practices

- 1. CCP had partnered with "Feedback Foundation" and "Ayya Waste Management Services" to manage the Material Recovery Facilities and sorting stations. Identity Cards have also been provided for the personnel engaged for the work. The CCP also implemented initiatives to incentivize the sale of recyclables and to operate and manage facilities for these organizations, with support extended under Corporate Social Responsibility/United National Development Programme (CSR/UNDP) programs. These organizations were also authorized to purchase recyclables from residential colonies, further promoting their involvement in waste management activities.*
- 2. Valpoi and Sankhali MCs had provisions to incentivise the most efficient workers engaged in SWM related work.*

Audit in this regard observed the following:

- 11 ULBs out of 14 (except Valpoi MC, Sankhali MC, and CCP) did not establish a system to recognize organization of waste pickers or informal waste collectors.

- Four⁴⁷ ULBs involved SHGs to participate in awareness programs related to SWM. Six SHGs under Mapusa MC and one under Quepem MC were registered with GSUDA for SWM and actively engaged in the segregation and collection of waste.
- However, other ULBs did not involve SHGs in any activities related to solid waste management.

The Department stated (June 2024) in its reply that ULBs were making efforts towards involvement of SHGs and informal sector waste pickers and will continue to encourage their participation in SWM activities.

The remediation of legacy dumps was completed in all eleven dumpsites, while the disposal of RDF and inert was done only in four dumpsites (August 2024). Further, three new dumpsites were created in three test-checked ULBs (Margao, Mapusa and Mormugao MCs) due to the insufficient treatment of waste.

The SHGs were not engaged in any waste management related activities by most of the ULBs.

Recommendation 6: Goa Waste Management Corporation may take necessary steps to clear Refuse Derived Fuel and inert of remediated dumpsites while ensuring that new sites are not created.

Recommendation 7: Urban Local Bodies may adopt inclusive Solid Waste Management practices by involving informal waste pickers, Non-Government Organisations, and Self-Help Groups in the waste management related activities, including information education and communication activities, to enhance the efficiency of solid waste management within the communities.

1.5.17 Other waste management

1.5.17.1 Bio-medical Waste

As per the Bio-Medical Waste Management Rules (BMWWR) of 2016, the Goa State Pollution Control Board (GSPCB) is mandated with several responsibilities, including the maintenance of an inventory of occupiers and data pertaining to bio-medical waste generation, treatment and disposal within the region. It is entrusted with the authority to grant, renew, suspend or refuse authorization for healthcare facilities involved in the handling of bio-medical waste. It was incumbent upon the GSPCB to monitor and enforce compliance with the stipulated rules. GWMC was tasked for establishment of bio-medical treatment facility in the State and registering all health care facilities and ULBs for treatment of bio-medical waste.

⁴⁷ Mormugao, Cuncolim, Canacona and Ponda MCs

- ***Lack of comprehensive database of bio-medical waste generators***

Audit observed that GSPCB lacked comprehensive information regarding waste generation and treatment across all healthcare facilities (HCFs) in the State. It was noticed that only 27 to 49 *per cent* of HCFs submitted their annual reports⁴⁸ to GSPCB between 2017 and 2022. Consequently, the GSPCB was not in a position to accurately assess the volume of BMW generated and its appropriate disposal.

The GSPCB lacked a robust monitoring mechanism regarding the establishment of new healthcare facilities. The GSPCB typically became aware of the existence of such facilities only upon receipt of a complaint or when the facility itself sought authorization. Consequently, the generation of bio-medical waste in unregistered healthcare establishments remained unknown to the GSPCB, which was a lapse on the part of the GSPCB in enforcing its mandate as laid down in the BMWMR, 2016.

During the exit conference, the GSPCB accepted (May 2024) the facts and assured that the data of HCFs would be updated from the Health Department.

- ***Sub-par utilisation of CBWT facility***

A Common Bio-Medical Waste Treatment (CBWT) Facility, operated by M/s Biotic Waste Solutions under the GWMC in Kundaim, commenced operations in October 2021. Examination of records provided by M/s Biotic Waste Solutions to Audit, revealed that 1,230 hospitals/ dispensaries, with a total of 6,573 beds, had entered into agreements with them as of March 2023. According to data provided by M/s Biotic Waste Solutions, a total of 1,810 tonnes of BMW was collected and treated from October 2021 to March 2023. Hence, the daily treatment ranged from three to four tonnes, while the plant's capacity was 28 TPD. As per BMW annual report prepared by GSPCB (upto December 2022), only 1,203 HCFs were registered with GSPCB, while 1,230 HCFs had registered with Biotic Solution by December 2021. In the absence of comprehensive data on HCFs and the quantity of BMW generated, the Board could not ensure that bio-medical waste was being treated in accordance with scientific standards in the State.

The Managing Director, GWMC stated (May 2024) during the exit conference that the CBWT facility was underutilized due to non-receipt of sanitary waste from ULBs and that they are in the process of finalizing the rates regarding the collection and transportation of sanitary waste to the facility. The Secretary (UD) directed the GWMC to expedite the process.

⁴⁸ 235 out of 603 health facilities in 2017; 235 out of 718 in 2018; 261 out of 779 in 2019; 386 out of 779 in 2020, 325 out of 780 facilities in 2021 and 329 out of 1,203 facilities in 2022.

However, the fact remains that all ULBs had not been registered with CBWT facility for the collection and disposal of sanitary waste from ULBs even after more than two years of establishment of CBWT facility, which led to the accumulation of sanitary waste in dumpsites as well as adopting unscientific disposal practices.

Thus, GSPCB was yet to fulfil its mandates especially in regard to the maintenance of data pertaining to HCFs and the BMW generated. Further, it failed to reconcile the data available with Biotic Solution and also to pursue with DHS for updating its database.

Recommendations 8: Goa State Pollution Control Board may take steps to update the data of all health care facilities in the state through Directorate of Health Services and ensure that all are registered with the Common Bio-Medical Waste Treatment Facility to ensure proper collection and treatment of bio-medical waste.

1.5.17.2 E-waste

As per Rule 17 (Schedule IV) of the e-waste Management Rules of 2016, it is the responsibility of the State Pollution Control Board to manage e-waste effectively. This includes tasks such as maintaining inventories of e-waste, granting and renewing authorizations to manufacturers, dismantlers, recyclers, and refurbishers, as well as monitoring and ensuring compliance with Extended Producer Responsibility (EPR) regulations.

- Absence of e-waste management plan***

The Audit Report for the year ended March 2018, had highlighted the absence of an e-waste management plan in the State. The GWMC had engaged a consultancy firm in August 2018 to develop an e-waste Management Plan along with preparation of tender documents for establishing e-waste treatment facilities. However, the GWMC could not finalize the e-waste management plan. The consultant/firm submitted the final report (July 2020) with tender documents and an awareness plan, which was yet to be finalized by GWMC and there is no e-waste management plan for the State as yet (May 2024).

During the exit conference, the MD (GWMC) replied (May 2024) that the e-waste management plan was under preparation.

- Delay in setting up e-waste treatment facility***

The GWMC awarded (April 2021) the work for establishment of an e-waste treatment facility in Pissurlem to M/s CAM Industrial Services, but the land was handed over only in July 2022. The plant was to be ready within one year of the handing over of the plot but the agency was yet to complete the same as of June 2023.

During the exit conference, the MD (GWMC) assured (May 2024) that the construction work of e-waste treatment facility would be completed by August 2024. The fact, however, remains that the construction is still under progress and M/s CAM Industrial Services has sought extension for completion of facility till May 2025.

Audit also noticed significant variations between the e-waste generation estimates as per e-waste inventory report (May 2019) and collection as per e-waste annual report as shown below:

Table 1.11: Insufficient collection of e-waste

(in tonnes)

Year	Estimated Generation	Collection	Difference
2018-19	7682.24	153.17	7529.07
2019-20	8491.29	218.54	8272.75
2020-21	9464.61	152.75	9311.86
2021-22	10639.20	291.71	10347.49
Total	36277.34	816.17	35461.17

(Source: Data provided by GWMC and GSPCB)

The data presented in the table illustrates that over a span of four years, only two *per cent* of e-waste was collected by formal e-waste collectors. Consequently, there was a substantial accumulation of 35,461.17 tonnes of e-waste, which was either improperly disposed of or handled by unauthorized individuals. According to the inventorisation report provided by GWMC, there were over 700 scrap dealers across Goa, out of which approximately 350 were registered. However, none of the registered scrap dealers exclusively handled electronic waste. This raises concerns about the possibility of e-waste being dealt with without proper registration, potentially leading to unscientific disposal practices, posing grave risks to the environment and public health.

The GSPCB stated (February 2023) that they conducted inspections of authorized dismantlers during the processing of consent/authorization applications, as well as when requested by the CPCB during the processing of EPR authorizations⁴⁹.

The reply of GSPCB is not tenable as it did not comply with the e-waste management rules with regard to the conduct of random inspections of dismantlers/recyclers/refurbishers.

The GSPCB did not implement the e-waste management rules in the State and lacked comprehensive inventories for e-waste. Also, it could not identify the unauthorized e-waste dismantler/scrap dealers. The preparation and notification of an e-waste management plan was still

⁴⁹ “extended producer responsibility” (EPR) means responsibility of any producer of packaging products such as plastic, tin, glass, and corrugated boxes, *etc.*, for environmentally sound management, till end-of-life of the packaging products.

pending with GWMC. The e-waste treatment plant was not completed till March 2023.

Recommendations 9: Goa Waste Management Corporation may expedite the finalization of e-waste Management Plan and complete the work of e-waste treatment facilities.

Recommendation 10: Goa State Pollution Control Board may take steps to identify and register the scrap dealers for e-waste and monitor the scientific disposal of e-waste.

1.5.18 Monitoring and evaluation of Waste Management System in ULBs

Audit sought to assess whether the monitoring and evaluation of SWM system including adequacy of awareness creation, citizen engagement for effecting behavioural change, complaint redressal mechanism for citizens, assessment of environmental impacts and implementation of internal control and monitoring mechanism was adequate and effective in the test-checked ULBs. The related findings have been discussed as under:

1.5.18.1 Monitoring of SWM in ULBs

Under Rule 23 of the SWM Rules, 2016, the Department-in-charge of the local bodies in the State must establish a State Level Advisory Body (SLAB) within six months of the rules' notification, to review matters related to SWM and advise the Government on implementation of the rules. Similarly, Rule 16 of the Plastic Waste Management (PWM) Rules mandates the establishment of a State Level Advisory Committee (SLAC) to monitor implementation of the rules. Both SLAB and SLAC are required to convene a meeting at least once in every six months.

Audit observed that though the SLAB and SLAC were formed in March 2017 and December 2017 respectively, meetings were not held as mandated. Only nine meetings by SLAB were held as against 12 meetings to be held from the date of formation till May 2023 and nine meetings by SLAC were held as against 12 till May 2023.

Clause 6.1 of the SWM Manual, 2016 emphasizes implementing quality assurance systems for efficient MSWM. It calls for daily monitoring of all components including collection, processing and disposal by the head of the MSWM Department overseeing monitoring and evaluation (M&E) of SWM. Field staff from wards are to be periodically involved, and ward-level committees are to actively engage in monitoring various MSWM services.

Monitoring committees for SWM were in place in 13 out of 14 ULBs. CCP informed that its Standing Committee oversees the SWM activities in

its jurisdiction. Audit observed that meetings of SWM committees in ULBs were irregular. Six ULBs, namely Mapusa, Bicholim, Pernem, Ponda, Margao, and Quepem, did not conduct any meeting during 2017-18 to 2021-22. This was despite the fact that the Ponda and Pernem MCs constituted or re-constituted the committees five times during the same period.

Audit also observed (May 2023) that there was no monitoring mechanism in DUD in-charge of LBs as per SWM Manual, 2016⁵⁰ and the only monitoring by DUD was with regard to submission of annual reports by municipalities to the GSPCB.

The Department while acknowledging the observations stated (June 2024) that it will ensure that regular meetings of SLAB and SLAC are taking place besides stating that directions would be issued to ULBs to regularly review their SWM activities in their respective jurisdiction.

Monitoring mechanisms pertaining to SWM in the ULBs were deficient due to the sub-optimal functioning of the committees responsible for the same.

Recommendation 11: The State Government may ensure regular meetings of the State Level Advisory Board and State Level Advisory Committee as per Rules are held to monitor Solid Waste Management (SWM) activities effectively. To strengthen the SWM within their jurisdiction, the Urban Local Bodies may constitute SWM monitoring committees and conduct meetings regularly to review the SWM activities.

1.5.18.2 Monitoring of ULBs by GSPCB

As per Rule 16 of the MSW Rules, 2016, the GSPCB as part of its duties, is responsible⁵¹for the monitoring of SWM activities in the State. The GSPCB is required to enforce these rules through ULBs in their respective

⁵⁰ As per CPHEEO Manual, Para 7.1, a comprehensive monitoring, and evaluation system should be adopted for assessing progress towards meeting the targets in the MSWM plan and for monitoring successful implementation of the plan. The monitoring system adopted should (i) collect data regularly; and (ii) analyse collected information, take or propose corrective measures, and support the planning and implementation process.

⁵¹ Rule 16 states the duties of State Pollution Control Board shall: (a) enforce these rules in their State through local bodies in their respective jurisdiction and review implementation of these rules at least twice a year in close coordination with concerned Directorate of Municipal Administration or Secretary-in-charge of State Urban Development Department; (b) monitor environmental standards and adherence to conditions as specified under the Schedule I and Schedule II for waste processing and disposal sites; Rule 16(4) states State Pollution Control Board shall monitor the compliance of the standards as prescribed or laid down and treatment technology as approved and the conditions stipulated in the authorisation and the standards specified in Schedules I and II under these rules as and when deemed appropriate but not less than once in a year.

jurisdiction and review their implementation at least twice a year in close coordination with the concerned Directorate of Municipal Administration/ Secretary-in-charge of State Urban Development Department.

1.5.18.2 (a) Inadequate monitoring of SWM by GSPCB

As per the rule, two inspections were to be conducted in each ULB annually by the GSPCB. Audit noticed (May 2023) that GSPCB inspected ULBs only as per the direction of Hon'ble High Court and on the basis of complaints received. The GSPCB carried out 11 inspections in three⁵² ULBs for the year 2017-18 and imposed fines for open burning of waste. While no inspections were carried out for the years 2018-19 and 2019-20, GSPCB inspected all the 14 ULBs in 2020-21 and 2021-22 respectively. Total fines imposed were to the tune of ₹ 33.15 lakh (**Appendix 1.7**) for non-compliance of SWM rules and HC's directions. Although inspections were conducted based on complaints received through phone calls, SMS and posts, *etc.*; audit observed that there was no formal mechanism for citizens to register their complaints regarding SWM related issues. Thus, the GSPCB failed to review the implementation of SWM rules by way of carrying out inspections of the ULBs twice a year periodically, as required under the Rules.

Accepting the facts, the GSPCB replied (August 2024) that periodical inspection of local bodies will be carried out as per SWM Rules, 2016.

1.5.18.2 (b) Deficiencies in monitoring of plastic waste by GSPCB

As per the Plastic Waste (Management and Handling) (PWM) Rules, 2016 responsibility for various aspects of plastic waste management was assigned to plastic waste generators (manufacturer/producer) and the local bodies, while the GSPCB was responsible for monitoring and enforcement of the same. Rule 17(3) of the PWM Rules, 2016, states that the State Pollution Control Board shall submit an annual report on the implementation of the Plastic Waste Management (PWM) Rules, 2016 to the Central Pollution Control Board (CPCB).

Among others, the GSPCB was required to submit details of estimated plastic waste generation, collection, segregation and disposal in the State annually to the CPCB. Details of the meeting of the State Level Advisory Body (SLAB) along with its recommendations on implementation, number of local bodies that submitted their annual report as per Rule 12 to them, were also to be reported.

Audit scrutinized the annual reports from 2017-18 to 2020-21 (the Board did not provide annual report 2021-22 to audit). As per the Annual Report 2020-21, estimated generation of plastic in the State was 29,440 tonnes per

⁵² CCP, Mapusa and Margao

annum (80.66 TPD). Audit observed that GSPCB had provided only the detail of estimated generation of the PW while the information regarding collection and disposal of the same was not reported. Further, it was seen that the estimated generation of plastic waste as per the annual reports for the years 2017-18 and 2018-19 was equal to the quantity of plastic waste disposed off by the GWMC alone. Details of meetings of the SLAB along with their recommendations on implementation of the Rules were not reported by the GSPCB to the CPCB. Also, the number of local bodies (both ULBs and VPs) in its jurisdiction, that submitted their annual reports, based on which the GSPCB compiled the report, was also not reported. Details of the same were not furnished to audit, though called for.

Thus, adequate assurance could not be drawn that the GSPCB was adequately monitoring the plastic waste management in the State.

During the exit conference, the Secretary (UD) directed (May 2024) GSPCB to comply with the mandatory requirements and instructed the Director (UD) to issue a circular to ULBs to ensure the timely submission of annual reports to GSPCB.

The GSPCB could not carry out adequate number of inspections and lacked comprehensive status of implementation of PWM Rules, 2016 in the State.

Recommendation 12: The Goa State Pollution Control Board may ensure adequate monitoring and reporting on all the parameters required by the Central Pollution Control Board for effective implementation of Plastic Waste Management Rules in the State.

1.5.19 Deficiencies in Information, Education & Communication (IEC) activity

Rule 15 (zg) of SWM Rules, 2016 and Section 1.4.5.13 of the Manual on MSWM, 2016 underscored the importance of IEC activities and required the Government and ULBs to create public awareness and educate waste generators on the overall objectives of MSWM. The various modes of communication used by the 14 ULBs and GSUDA is given below:

Table 1.12: Modes of communication used for IEC on SWM by ULBs and GSUDA

Sl. No.	Modes of Communication used	Number of 14 ULBs and GSUDA										Records not maintained	
		2017-18		2018-19		2019-20		2020-21		2021-22			
		Yes	No*	Yes	No*	Yes	No*	Yes	No*	Yes	No*		
1	Audio	0	12	1	11	1	11	0	12	3	9	3	
2	Video	0	12	0	12	0	12	2	10	1	11	3	
3	Mass communication	1	11	1	11	0	12	2	10	6	6	3	

Sl. No.	Modes of Communication used	Number of 14 ULBs and GSUDA											
		2017-18		2018-19		2019-20		2020-21		2021-22		Records not maintained	
		Yes	No*	Yes	No*	Yes	No*	Yes	No*	Yes	No*		
4	Wall paintings	1	11	4	8	3	9	3	9	4	8	3	
5	Schools	3	9	3	9	4	8	5	7	9	3	3	
6	Hoardings/banners	4	8	4	8	4	8	6	6	8	4	3	
7	Pamphlets	5	7	4	8	5	7	5	7	10	2	3	
8	Street Play	2	9	2	9	1	10	1	10	3	8	4	

(Source: Data provided by ULBs and GSUDA)

*NA (not available) is also included in "No"

IEC activities emphasize waste segregation at the source, litter reduction, and educating citizens on proper waste handling techniques and play a crucial role in SWM by also raising awareness about the adverse effects of inefficient SWM management on health and the environment.

It can be seen from the above table that the majority of ULBs utilized pamphlet distribution, school events, and hoardings/banners as their primary IEC activities. No records were maintained in three⁵³ ULBs regarding the mode of IEC. While there was an increase in the number of ULBs conducting IEC activities from 2017 to 2022, very few ULBs were utilizing audio, video, and street play methods. In test-checked ULBs, the CCP did not maintain any record for IEC activity, though they conducted the activities through SHGs and NGOs. Margao and Mapusa MCs did not conduct any IEC activity till the year 2020-21. However, Margao MC conducted two mass communication activities in 2021-22 and Mapusa MC also commenced IEC activities from the same year. There was no separate budget provision for IEC activities in eight⁵⁴ ULBs.

It was however, evident that the ULBs did not take adequate concrete steps to actively promote IEC activities to influence human behaviour positively like segregation of waste at source, stopping littering of waste and minimising waste, etc.

The Department stated in its reply (June 2024) that necessary steps would be taken for conduct of awareness activities and that directions would be issued to ULBs and agency involved in conducting IEC activities for ensuring the same.

IEC activities conducted by ULBs and GSUDA were insufficient and ineffective with regard to SWM in the State.

Recommendation 13: Given the importance of Information, Education and Communication (IEC) activities in bringing about behavioural change with respect to solid waste management, the ULBs and the Department may ensure that adequate IEC activities are conducted.

⁵³ CCP, Canacona and Pernem

⁵⁴ Mapusa, Valpoi, Margao, Sankhali, Quepem, Pernem, Ponda and Cuncolim