सत्यमेव जयते

Report of the Comptroller and Auditor General of India Performance Audit on Solid Waste Management in Urban Areas of Meghalaya

for the year ended 31 March 2022

SUPREME AUDIT INSTITUTION OF INDIA

लोकहितार्थ सत्यनिष्ठा

Dedicated to Truth in Public Interest

Government of Meghalaya

Report No. 2 of 2024

Report of the
Comptroller and Auditor General of India

Performance Audit
on
Solid Waste Management in Urban Areas of Meghalaya

for the year ended 31 March 2022

Government of Meghalaya

Report No. 2 of 2024

TABLE OF CONTENTS

APPENDICES

PREFACE

This Stand Alone Report of the Comptroller and Auditor General of India containing the results of Performance Audit on 'Solid Waste Management in Urban Areas of Meghalaya' for the period from 2017-18 to 2021-22 has been prepared for submission to the Governor of Meghalaya under Article 151 of the Constitution of India.

The Performance Audit was conducted to evaluate whether management of municipal solid waste and special waste (including plastic waste, e-waste, bio-medical waste and construction & demolition waste) was carried out according to existing statutes and legislations.

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

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Efficient management of different types of solid waste generated by rapidly growing towns and cities across the country is the need of the hour. With ever increasing population and growing consumerism, solid waste management has become an important issue concerning legislators and the public alike. Integrated waste reduction policies along with introduction of new and innovative solutions are the key to minimise the detrimental effects of improper solid waste management (SWM) on the environment and human health.

➢ Scope of Audit

A performance audit on 'Solid Waste Management in Urban Areas of Meghalaya' for the period 2017-18 to 2021-22 was conducted to evaluate whether the management of municipal solid waste (MSW) and special waste (including plastic waste, e-waste, bio-medical waste and construction & demolition waste) was carried out according to existing statutes and legislations. It involved examination of the records relating to SWM in the Directorate of Urban Affairs, State Investment Project Management and Implementation Unit (SIPMIU), Meghalaya Urban Development Authority (MUDA), the Meghalaya State Pollution Control Board (MSPCB), Deputy Commissioners, Municipal Boards, Town Committees and Traditional Institutions (ADCs and Dorbar Shnongs) in the selected urban areas.

(Paragraph 2.4)

➢ Delay in notifying State Policy by Urban Affairs Department

The performance audit showed that there was a delay in notifying the Meghalaya State Waste Management Policy and Strategy, despite the SWM Rules, 2016 reflected lackadaisical approach of Urban Affairs Department in implementing the waste management rules. Further, the State Government was yet to approve the State Policy on Construction & Demolition (C&D) Waste even after a delay of almost five years. The delay in notification and approval of requisite legislations has inhibited the implementation of SWM activities.

(Paragraph 3.2 & 7.1.1)

➢ Framing of Bye Laws

None of the Municipal Boards in Meghalaya, and two autonomous district councils, namely, JHADC and GHADC, had framed bye-laws for implementing SWM Rules 2016, while the KHADC had only notified the Khasi Hills Autonomous District (SWM) Act, 2020 in February 2022, rendering the implementation of SWM Rules 2016 ineffective due to the absence of legally empowering bye-laws.

(Paragraph 3.3)

- **Non- Preparation of Solid Waste Management Plans by Urban Local Bodies**

Urban Local Bodies (ULBs) in Meghalaya were required to prepare comprehensive short-term and long-term Solid Waste Management (SWM) plans aligned with the State policy. However, the selected Municipal Boards, Town Committees, and Census Towns have failed to develop such plans within the stipulated timelines, with only Shillong having submitted a City Solid Waste Action Plan that awaits approval. Absence of SWM Plans indicated that ULBs had not set any short-term or long -term goals and targets absence of targets and goals for implementing the SWM Rules in Meghalaya.

(Paragraph 3.4)

- **Inadequate enforcement of SWM Rules in Town Committees and Census Town Areas**

In Meghalaya, jurisdiction of the Town Committees and Census Towns was not vested upon the Urban Affairs Department. Rather, these areas (47 *per cent* of the total urban population) are governed by the concerned ADCs. Annual Reports were not submitted by the Town Committees and Census Towns to the Director, Urban Affairs Department nor to the MSPCB. As a result, there was no data available with the MSPCB regarding SWM in these areas. Although the Deputy Commissioners were directed to ensure timely submission of Annual Reports by all Town Committees under their respective jurisdiction in a meeting chaired by the Chief Secretary (August 2019), no reports have however been submitted by the Town Committees/Census Towns during the period covered by audit.

(Paragraph 3.5)

- **Non-Preparation of Contingency Plans**

The failure of the test-checked urban areas in Meghalaya to develop contingency plans for waste storage, as stipulated by the MSWM Manual 2016, left them unprepared to address unforeseen crises like waste transportation disruptions and waste accumulation on streets of Jowai leading to public protest.

(Paragraph 3.6)

- **Periodical review of SWM Rules by Urban Affairs Department**

Though the Urban Affairs Department in-charge of implementing SWM and Plastic Waste Management Rules established State Level Advisory Committees for periodic review of implementation of SWM Rules 2016, absence of records of such meetings indicated that these committees were largely non-functional.

(Paragraph 3.7)

- **Inadequate assessment of waste generation**

A comprehensive assessment of waste generation using well-defined metrics is crucial for effective Solid Waste Management, however, lack of reliable data collection and

periodic surveys in urban areas, along with discrepancies in waste estimation methods, indicated deficiencies in planning and coordination.

(Paragraph 3.8)

➢ Maintenance of SWM data by MSPCB

The effective management of solid waste relies on accurate data collection and analysis, yet discrepancies between waste generation and collection figures reported by the Meghalaya State Pollution Control Board (MSPCB) and information provided by tested Urban Local Bodies (ULBs), along with the absence of data from Town Committees and Census Towns, underscore issues of data accuracy, completeness, and reliability.

(Paragraph 3.9)

➢ Availability of supervisory posts for SWM purposes

The inadequate availability of supervisory staff, falling significantly short of the recommendations outlined in the MSWM Manual 2016, has adversely affected the ability of the selected Urban Local Bodies (ULBs) and Town Committee in Meghalaya to effectively manage solid waste activities, including collection and disposal.

(Paragraph 3.10)

➢ Training of SWM Staff

Unsatisfactory training and capacity-building initiatives for staff involved in Municipal Solid Waste Management (MSWM) activities across various selected Urban Local Bodies (ULBs) in Meghalaya, resulted in operational inefficiencies and issues like mixing of segregated waste during collection, transportation, and processing.

(Paragraph 3.11)

➢ Integration of informal waste collectors in waste management

The recognition and integration of the informal waste sector, including waste pickers and collectors, into the formal waste management system has been inadequately addressed in Meghalaya.

(Paragraph 3.12)

➢ Achievement of Service Level Benchmark

The Service Level Benchmarking (SLB) initiative launched by the Ministry of Urban Development aims to monitor urban services, but despite notification for Shillong Municipal Board (SMB), SLBs for other Municipal Boards were not established, and SMB's performance in meeting SLB targets was generally below benchmarks.

(Paragraph 3.13)

➢ Sources of fund

During the period from 2017-18 to 2021-22 in Meghalaya, the State Government heavily relied on external funding (Asian Development Bank) and Central grants, while the

budgetary support from the State budget as agencies' own resources contributed only a minor share towards financing of Solid Waste Management activities.

(Paragraph 4.2)

➢ Municipal Finances

The financial resources of the six Municipal Boards in Meghalaya from 2017-18 to 2021-22, primarily consisted of their own revenue, Central Finance Commission (CFC) transfers and State Grants-in-Aid, but a significant gap between operating revenue and operating expenses for Solid Waste Management (SWM) activities exists due to insufficient collection of user charges, indicating the need for improved revenue generation and strict enforcement of SWM charges.

(Paragraph 4.3)

➢ Collection of User charges

Despite the provision in SWM Rules and local bye-laws for the collection of user fees from households to cover solid waste management costs, most Municipal Boards did not collect user fee resulting in a significant loss of potential revenue that could have helped offset operating losses incurred in SWM activities.

(Paragraph 4.4)

➢ Segregation of waste at source in the urban areas

Insufficient segregation of solid waste at source by households and institutions and no facilities for segregating domestic hazardous waste indicated weak enforcement of SWM Rules in Meghalaya, on one hand, and other hand an absence of effective awareness raising programmed among the households and citizens. Despite distribution of dual-coloured household bins for source segregation of waste, the effectiveness of segregation of waste at source was inadequate. Data available with the department on waste segregation at source was unreliable.

(Paragraph 5.1.1)

➢ Segregation of domestic hazardous waste and sanitary waste

Absence of notified lists of hazardous waste items, and failure to establish waste deposition centers as required by regulations, and inadequate awareness resulted in non-implementation of source segregation and management of domestic hazardous waste.

(Paragraph 5.1.2)

➢ Extent of collection of municipal waste at source

Municipal Boards and Dorbar shnongs played primary role in collection of municipal waste from households under Municipal areas and most ULBs reported almost hundred *per cent* collection of municipal waste at source, absence of a reliable system for assessment of quantum of waste imposed limitation on the reliability of the data available, including absence of weighbridges methods, including the absence of

functioning weighbridges, has led to uncertainties in quantifying the actual amount of waste collected, raising concerns about waste management accuracy and effectiveness.

(Paragraph 5.2.1)

- **Infrastructure for Collection and Transportation of municipal solid waste**

Lack of source segregation in the tested urban areas resulted in mixed waste being sent to treatment facilities, leading to manual sorting by informal workers during processing and disposal, consequently affecting the quality of processed waste.

(Paragraph 5.2.2)

- **Facilities for waste collectors and handlers**

Vehicles utilised for transportation of waste were not equipped with the necessary specifications such as partitions for segregated waste and management information systems. As such, waste was mixed during transportation and effective monitoring of the whole process was non-existent.

(Paragraph 5.3.1)

- **Monitoring of transportation vehicles through Management Information System**

The ULBs and Autonomous District Councils in Meghalaya were ill-equipped to manage and monitor transport vehicles carrying municipal waste from collection points to dumping sites. Absence of Management Information Systems (MIS) and essential facilities in waste transportation vehicles, along with the lack of GPS and GIS, limited their capacity for identification of garbage vulnerable points and regulated movement of transport vehicles as part of solid waste management services.

(Paragraph 5.3.2)

- **Status of Waste Processing in Meghalaya**

Test check of urban agglomerations revealed that significant portion (70 *per cent* to 98 *per cent*) of municipal waste ended up in landfills without any processing.

(Paragraph 6.1)

- **Integration of the informal sector in recycling process**

Despite the presence of recycling initiatives in certain urban areas, such as Shillong and Tura, the proper functioning and integration of waste recovery centers and recyclers into the solid waste management system, as required by SWM Rules, 2016, have been lacking, leading to suboptimal recycling efforts.

(Paragraph 6.3)

- **Compost plant in Nongpoh**

The Nongpoh solid waste management project, sanctioned under JnNURM, faced delays and remained incomplete, with the composting facility and associated structures

left unused and unfunctional, despite payments for civil works and machinery which led to wasteful expenditure of ₹ 4.48 crore.

(Paragraph 6.4.1)

- **Compost Plant in Tura**

The Tura solid waste management project sanctioned under JnNURM, including a compost plant, faced delays and remained incomplete, with the composting facilities and associated structures left unused and the machinery not utilized as intended, despite payments for civil works and commissioning which led to wasteful expenditure of ₹ 5.16 crore.

(Paragraph 6.4.2)

- **Compost plant in Shillong**

The compost plant installed at Marten landfill site in Shillong was handed over to the Shillong Municipal Board (SMB) but experienced underutilization due to challenges in source segregation, lack of marketing efforts, and issues with compost quality, resulting in a production far below its capacity.

(Paragraph 6.4.3)

- **Identification and acquisition of suitable land for sanitary landfill and other waste management facilities.**

The Solid Waste Management Rules mandated the identification and allocation of suitable land for waste processing, but despite the reconstitution of a Task Force Committee and recommendations for certain areas, the acquisition process for the required land in multiple urban areas including Shillong, Tura, and Jowai was still pending as of May 2023.

(Paragraph 6.5.1)

- **Availability and Landfill Capacity of the Waste Disposal Sites**

Despite the establishment of Task Force Committees and the stipulation under Solid Waste Management Rules, none of the four tested urban areas have successfully acquired suitable land for processing and disposal facilities for solid waste, with only Tura having initiated the acquisition process among the three identified areas.

(Paragraph 6.5.2)

- **Open dumping of waste**

Waste generators in certain areas were observed to be violating Rule 4(2) of the Solid Waste Management Rules, 2016 by dumping waste in open spaces and water bodies, as seen during Joint Physical Verifications and reported in news articles, causing both environmental degradation and health risks.

(Paragraph 6.6)

➢ Meghalaya State Policy on Construction and Demolition Waste

Delay in finalizing and approving the Meghalaya State Policy on Construction & Demolition (C&D) Waste, along with the lack of direction from relevant authorities, has hindered the implementation of C&D Waste Management Rules 2016 in the State.

(Paragraph 7.1.1)

➢ Comparison between Meghalaya SWM Bye Law and C&D Waste Management Rules 2016

As per information furnished by MSPCB, there were 142 unauthorised Health Care Facilities in the state in 2020. Data for 2021-22 was not available even though called for.

(Paragraph 7.1.2)

➢ Authorisation status of Health Care Establishments

Healthcare facilities in Meghalaya showed a gradual decrease in unauthorized status from 2017 to 2020 under the Bio-Medical Waste Management Rules 2016, but MSPCB should ensure compliance of BMW Rules 2016 by all the HCFs in the state.

(Paragraph 7.2.1)

➢ Generation and treatment of Bio Medical Waste

Despite an increase in bio-medical waste (BMW) generation from 2017 to 2020, treatment by Common Bio-Medical Waste Treatment Facility (CBMWTF) surged from 37 *per cent* to 76 *per cent*, while captive treatment declined. However, scrutiny revealed operational issues with the sole CBMWTF in Shillong, casting doubt on the accuracy of reported data provided by MSPCB to CPCB.

(Paragraph 7.2.2)

➢ Disposal of Bio Medical Waste

Except for Shillong Municipal Board, the test-checked ULBs and Town Committees in Meghalaya lacked Common Bio-Medical Waste Treatment and Disposal Facilities (CBMWTF) as required by BMW Rules 2016, resulting in improper disposal practices that pose risks to public health and environmental contamination.

(Paragraph 7.2.3)

➢ MSPCB Status of CBMWF in Shillong

Non-functioning incinerator of CBMWTF Shillong attracted imposition of Environmental Compensation of ₹ 0.82 crore on Shillong Municipal Board by the CPCB.

(Paragraph 7.2.4)

➢ Producer Responsibility Organisation registered with MSPCB

In Meghalaya, there are three registered Producer Responsibility Organisations (PROs) based in Shillong responsible for collecting e-waste, but there was a lack of dedicated collection vehicles, insufficient storage facilities for categorization, and lack of awareness, hindering effective implementation of e-waste management as per E-Waste Rules 2016.

(Paragraph 7.3.1)

➢ Inventory of e-waste in the state of Meghalaya

The Meghalaya State Pollution Control Board (MSPCB) has failed to maintain an inventory of e-waste generation as required by E-Waste (Management) Rules 2016, leading to a lack of comprehensive data for comparison with e-waste collection by Producer Responsibility Organisations (PROs).

(Paragraph 7.3.2)

➢ Disposal of E-Waste mixed with Municipal Solid Waste

E-Waste found to be mixed with Municipal Solid Waste in Tura solid waste disposal site in contradiction to the E-Waste (Management) Rules 2016.

(Paragraph 7.3.3)

➢ Status of submission of Annual Return of Plastic Waste

The plastic waste management reporting by ULBs has been inconsistent as evidenced by incomplete and delayed annual reports, discrepancies between submitted data and CPCB estimates, and the lack of MSPCB's effective oversight and guidance to ensure accurate reporting.

(Paragraph 7.4.1)

➢ Setting up of infrastructure for plastic waste management

The selected ULBs and Town Committees in Meghalaya have not taken effective action to establish infrastructure for plastic waste management or provide accurate information on plastic waste, revealing a lack of commitment from both the local authorities and higher administrative bodies, while on-site observations demonstrate mixed disposal with MSW, limited segregation efforts, and challenges related to recycling capacity.

(Paragraph 7.4.2)

CHAPTER-I
INTRODUCTION

Chapter-I
Introduction

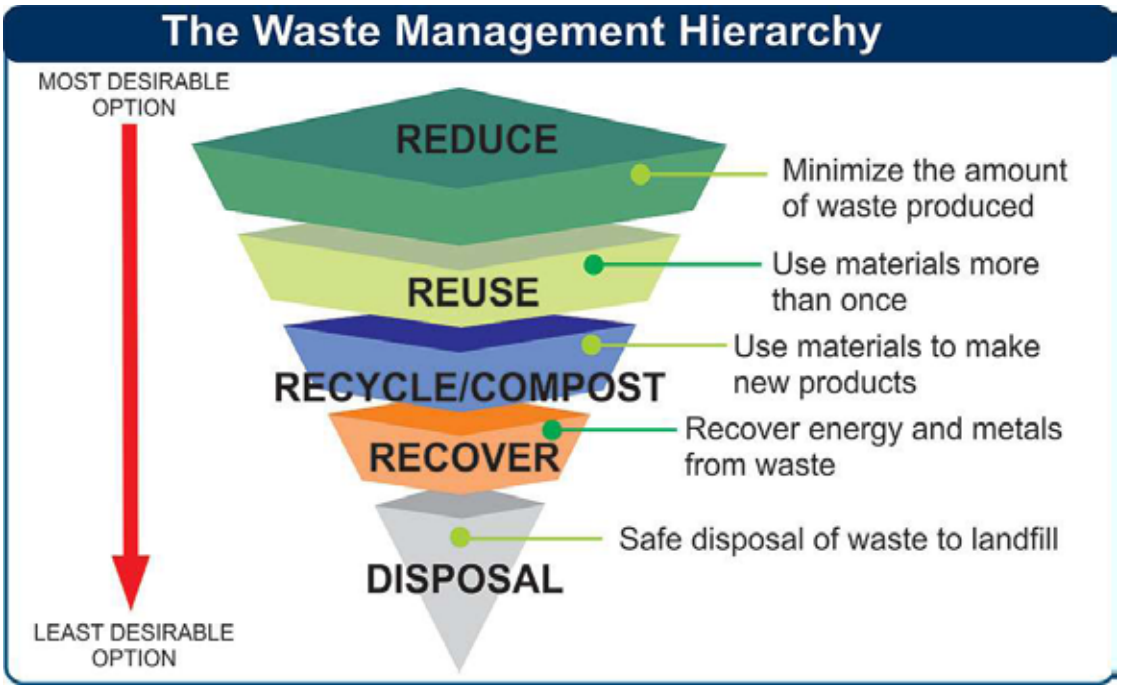
1.1 Definition and classification of waste

Waste are materials that are not prime products (that is, products produced for the market) for which 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[1]. Waste Management is the collection, transportation, recovery and disposal of waste, including the supervision of such operations and after-care of disposal sites. Waste accumulation and its improper handling and disposal represent a major threat to the environment as also to the health of all living organisms. Waste is generally classified into municipal solid waste (MSW), bio-medical waste (BMW), construction and demolition (C&D) waste, *e*-waste, plastic waste, industrial waste and hazardous waste by virtue of their nature. Inadequate management of waste has significant negative externalities in terms of public health and environmental outcomes. Besides, it has an adverse impact on the aesthetic appearance of the surroundings.

1.2 Waste Management hierarchy

An ideal waste management strategy requires that municipal waste generated should not be simply disposed. Efforts should be made to recover value from the waste by various methods - recover for energy resource, composting *etc*. A typical waste management hierarchy is shown in **Chart 1.1**:

Chart 1.1: Waste Management Hierarchy[2]



[1] Definition as per United Nations Statistics Division.

[2] 'Types of Recycling' published by Nord Holding AD – https://nordholding.bg/en/news-en/types-of-recycling.

1.3 Regulatory Framework

The Central Government has issued several notifications to regulate the prevention and control of waste in the country under the provisions of the Environment (Protection) Act, 1986. These cover the management and handling of municipal, biomedical, hazardous and plastic waste, *etc*. Some of the Act and Rules enacted by GoI are given below:

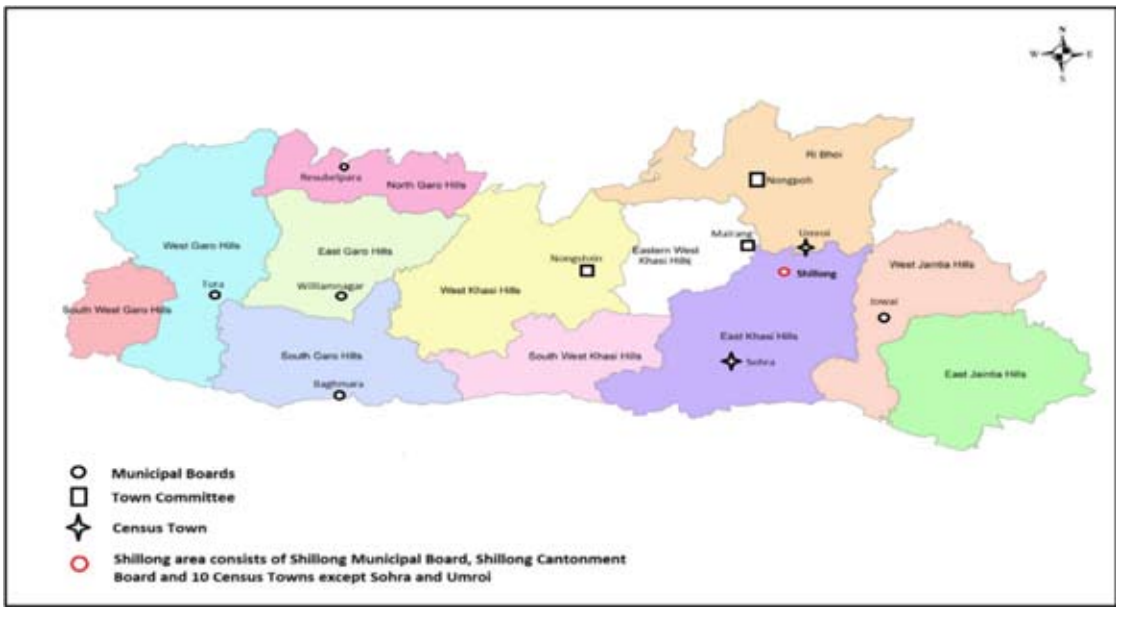
- Environment (Protection) Act, 1986 (EP Act) was enacted by GoI as an umbrella Act to cover all the specific and general provisions relating to pollution of the environment including the management of hazardous, bio-medical and solid waste. Under this Act, GoI also notified the Environment (Protection) Rules in 1986;
- The Bio-Medical Waste (Management and Handling) Rules, 2016;
- Solid Waste Management (SWM) Rules, 2016;
- Plastics Waste Management Rules, 2016;
- E-Waste (Management) Rules, 2016.;
- Construction and Demolition Waste Management Rules, 2016.

In conformity with the Solid Waste Management Rules, 2016, Government of Meghalaya (GoM) had notified the Meghalaya State Waste Management Policy and Strategy in Urban Areas on 17 June 2019 and also framed the Meghalaya Solid Waste Management Bye Law, 2020 on 19 May 2020.

1.4 Organisational Set-up for Management of Solid Waste in the Urban Area

As per Census 2011, Meghalaya has 22 urban areas (settlement/towns), predominant being Shillong Urban Agglomeration which comprises of 12 towns *viz.,* the Shillong Municipality, Shillong Cantonment and 10[3] census towns.

Chart 1.2: Map of urban areas in Meghalaya as per Census 2011



Source: Information available in department's website.

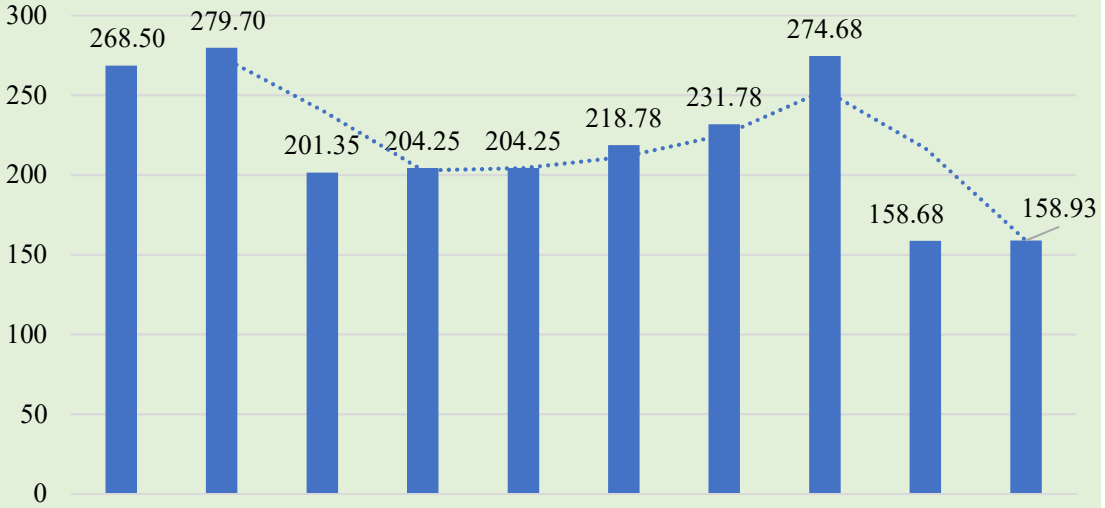
[3] (i) Mawlai, (ii) Pynthorumkhrah, (iii) Nongmynsong, (iv) Mawpat, (v) Umpling, (vi) Nongthymmai, (vii) Madanriting, (viii) Lawsohtun, (ix) Nongkseh & (x) Umlyngka.

The Urban Affairs Department, along with its parastatals is the nodal department for implementing policies and schemes pertaining to waste management in the urban areas. The administration of solid waste management is vested in the Municipal Boards. In Shillong, these responsibilities vest with Shillong Municipal Board for Shillong Municipal area and with the Cantonment Board in Shillong Cantonment area. The urban areas outside the Shillong Municipal Board or the Shillong Cantonment Boards, *i.e.* the census towns fall within the jurisdiction of the Khasi Autonomous District Council (as per Sixth Schedule provisions) which has delegated the task of solid waste management to the local traditional bodies, referred to as Dorbar Shnongs.

Among the 10 other urban areas in the State, five fall under municipal boards, three are under town committees and two are census towns. The total population covered under these notified urban areas was 5,95,450 out of the total population of the state which was 29,66,889 *i.e.* 20 *per cent* (**Appendix I**).

As per the study conducted by North Eastern Hill University[4], average waste generation per person per day in an urban area was estimated at 341 gms./capita/day. Trend in quantum of solid waste generated in the urban areas[5] over past ten years is shown in **Chart 1.3**.

Chart 1.3: Status of waste generation in Meghalaya (in TPD)



Source: Meghalaya State Pollution Control Board[6].

Fluctuating trend in average tonnes per day (TPD) of urban waste generation is a reflection on unreliability/incompleteness of available data, rather than a real decrease in the quantum of urban waste generated, as commented later in this Report. According

[4] Estimate as per the Solid Waste Quantification & Characterisation study conducted by the Department of Environmental Studies, North Eastern Hill University, Shillong, Meghalaya during 2010 – 2011.

[5] Figures submitted by MSPCB includes status of waste generation of six Municipal Boards and Shillong Cantonment Board.

[6] In cases where the Annual Reports for a particular year were not submitted to MSPCB by ULBs, the figures of the previous year have been taken into account.

to the latest census projections available, the urban population of Meghalaya increased by 31.12 *per cent* during 2001-2011, and is expected to rise further. Accordingly, the urban waste is also likely to shown in increasing trend.

CHAPTER-II
AUDIT FRAMEWORK

Chapter-II
Audit Framework

2.1 Introduction: Why did we take up this Audit?

Solid waste generation in Meghalaya, as per latest data available (March 2022), was reported to be 158.93 TPD, *i.e.* 58,009 metric tonnes annually. Management of solid waste in the urban areas of the State of Meghalaya has gained attention of the policy makers and citizens in recent years in view of various reports emanating in the Government Departments and in media regarding scarcity of dumping areas for municipal waste, inadequate waste processing facilities and rising instances of contamination of rivers in the State which serve as critical source of drinking water.

Performance Audit (PA) of "Solid Waste Management in Urban Areas" was conducted with a view to assess the efficacy of government agencies involved in solid waste management over the entire life cycle of waste management, namely, whether the government had in place mechanisms to assess accurately and regularly the quantum of different kinds of waste such as municipal solid waste, C&D waste, bio-medical waste, e-waste and plastic waste being generated in the urban areas , whether collection and disposal of waste was being done scientifically , whether facilities had been created for recycling, re-use and safe disposal of municipal solid waste, *etc.* Given the involvement of different agencies in the solid waste management in the State, Audit further sought to examine the role and accountability of each of the agencies involved. Issues covered in this PA have been examined against the legal framework, financial framework and operational guidelines embedded in various Acts, regulations and bye laws promulgated by the Union and the State governments in this regard.

2.2 Audit Objectives

Performance Audit of Solid Waste Management in urban areas of Meghalaya was undertaken with the objective to assess whether:

1. A functional institutional mechanism was in place for solid waste management supported by adequate funding and there were effective policies/strategies for waste management in urban settlements in accordance with the Acts/Rules, *etc.*;
2. The procedures for segregation, collection, transportation, processing and disposal of solid waste were carried out economically and scientifically; and
3. There was an efficient monitoring and evaluation mechanism for regulating the provisions of the Acts/Rules.

2.3 Audit Criteria

Audit findings were benchmarked against the criteria sourced from the following:

- Solid Waste Management Rules, 2016 and respective Manuals (Ministry of Urban Development);

- Bio-Medical Waste (Management and Handling) Rules, 2016;
- Plastics Waste Management Rules, 2016;
- E-Waste (Management) Rules, 2016;
- Construction and Demolition Waste Management Rules, 2016;
- Meghalaya State Waste Management Policy and Strategy in Urban Areas;
- Meghalaya Solid Waste Management Bye Law, 2020;
- Meghalaya State Pollution Control Board (MSPCB) guidelines issued from time to time; National Green Tribunal (NGT) orders and other Court orders; and
- NITI Aayog's document on Waste Wise Cities – Best Practices in Municipal Solid Waste Management.

2.4 Scope of Audit , Audit Sample and Audit Methodology

The PA was conducted to cover activities of the agencies concerned during the five-year period from 2017-18 to 2021-22. Under the scope of solid waste, municipal solid waste (MSW), bio-medical waste (BMW), construction and demolition (C&D) waste, *e*-waste, and plastic waste were covered.

The subject of solid waste management has been devolved to the urban local bodies in Meghalaya. However, the administration of solid waste management in the State not only depends on the nodal department, *i.e.* the Urban affairs department but also several other agencies. The three Autonomous District Councils which cover the entire state also play a significant role through traditional bodies. Accordingly, the audit sample was designed to cover all the significant agencies involved in management of solid waste in Meghalaya.

Under the audit sample three municipal boards out of six *viz.* Shillong, Jowai and Tura were selected[7]. One Town Committee *viz.* Nongpoh and two census towns, *viz.* Mawlai and Umpling were also selected by applying simple random sampling using IDEA application software. In addition the Urban Affairs department, State Investment Project Management and Implementation Unit (SIPMIU)[8], Meghalaya Urban Development Authority (MUDA), Meghalaya State Pollution Control Board (MSPCB) and three Autonomous District Councils[9] (ADCs) were also covered under this PA. The office of the Deputy Commissioners of the districts where the selected Municipal Boards/ Town Committees were located were also covered. Audit collected information from the Shillong Cantonment Board through written queries, as examination of records of the Cantonment Board and site visit was beyond the audit mandate of this office.

[7] Municipal Boards contained more than 25 *per cent* of the entire urban population in the region were selected.

[8] The Government of Meghalaya, Finance (Economic Affairs) Department, *vide* Notification dated 05 January 2009 constituted the State Investment Project Management and Implementation Unit (SIPMIU) in Meghalaya for implementation of the North Eastern Region Capital Cities Development Investment Programme (NERCCDIP) funded through ADB (Loan arranged through an agreement between Asian Development Bank (ADB) and Government of India).

[9] Khasi Hills Autonomous District Council (KHADC), Jaintia Hills Autonomous District Council (JHADC) & Garo Hills Autonomous District Council (GHADC).

Audit Planning was done through desk review based risk assessment and use of statistical sampling for selection of sample. Field Audit methodology comprised of examination of records of the entities, interview with the functionaries concerned and site visits along with the department officials.

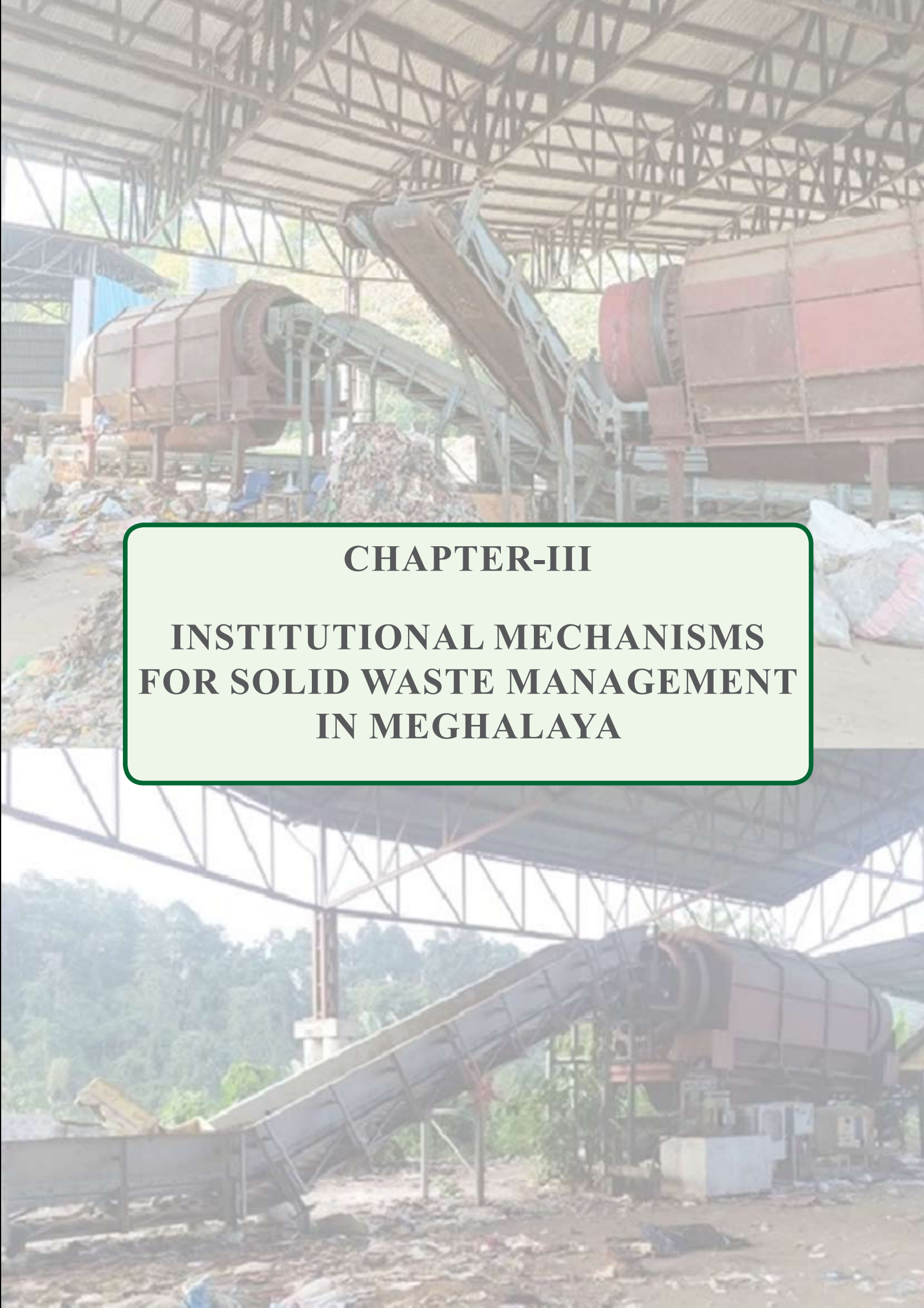
Being a technical subject, Audit engaged with experts in this subject as well as with the departmental officials involved in the solid waste management to identify areas of focus and fine tune audit scope. Two workshops were held (September 2022 and January 2023) with subject experts[10] to discuss specific issues surrounding Solid Waste Management (SWM) in North Eastern States, as these states have a different geographical and socio-economic profile, than many other States in the rest of the country.

The PA commenced with an entry conference (17 August 2022) where the audit objectives, criteria, scope and methodology were discussed. The Performance Audit Report was issued to the Government on 27 April 2023. Reply of the Government was not received till May 2023. Meanwhile, the findings of the PA were discussed with the Government representatives from the Urban Development Department and the Directorate, representatives of MSPCB, SIPMIU, MUDA, Municipal Boards of Shillong, Tura and Jowai, District Administration and representatives of Autonomous District Councils in an exit conference held on 17 May 2023. Replies received during exit conference have been suitably incorporated in the Report.

2.5 Acknowledgement

Audit acknowledges the cooperation and assistance extended by the State Government, all the selected ULBs/Town Committee, MSPCB, SIPMIU, MUDA, ADCs and Deputy Commissioners of the selected districts. Further, audit also acknowledges the guidance provided by the subject matter experts on issues pertaining to Solid Waste Management.

[10] (i) Dr Suneel Pandey**,** Director, Green Growth & Resource Efficiency Division, the Energy and Resources Institute (TERI), New Delhi (Solid Waste Management); (ii) Dr Paramita Datta Dey, Sr. Research Officer and Project Coordinator, NIUA, New Delhi (Waste Management in Smart Cities); (iii) Dr Brijesh Kumar Dubey, Professor, IIT Kharagpur (Waste Management in Smart Cities); Dr Asokan Pappu, Senior Principal Scientist, Chairman Business Development Cell CSIR-Advanced Materials and Processes Research Institute, Bhopal (Waste Management).



CHAPTER-III

INSTITUTIONAL MECHANISMS FOR SOLID WASTE MANAGEMENT IN MEGHALAYA

Chapter-III
Institutional Mechanisms for Solid Waste Management in Meghalaya

3.1. Introduction

Municipal Solid Wastes (Management and Handling) Rules 2000 apply to every municipal authority as these authorities are responsible for management of municipal solid waste (MSW).

Ministry of Environment, Forests & Climate Change (MoEFCC), Government of India (GoI), amended (8 April 2016) the Municipal Solid Waste (Management and Handling) Rules 2000 and notified the SWM Rules 2016, extending the jurisdiction of SWM Rules beyond 'municipal area' to cover the expanding boundaries of urban agglomerations, Census towns, notified areas and notified industrial areas, defence establishments *etc.*

Meghalaya State Waste Management Policy and Strategy was notified on 17 June 2019 under which the roles and responsibilities of different departments/agencies involved in solid waste management were defined. Details are shown in **Table 3.1**.

Table 3.1: Details showing the functions of different departments/agencies in respect of Solid Waste Management in Meghalaya

Level/ Responsible Institution	Role and responsibilities of Institution in SWM
State Government (Secretary, Urban Affairs Department and Director, Urban Affairs)	• Responsible for overall implementation and enforcement of SWM Rules, 2016. • Prepare State Solid Waste Management Policy and Strategy in consultation with core/key stakeholders. • Ensure identification and allocation of suitable land to ULBs for setting up solid waste processing and disposal/treatment facilities. • Facilitate establishment of Common Regional Sanitary Landfill for group of towns/ULBs falling within 50 kms on cost sharing basis and ensuring professional management of such landfill. • Capacity building of ULBs in SWM, prepare scheme for registration of waste pickers/dealers.
Meghalaya State Pollution Control Board	• Ensure the implementation of SWM Rules, 2016 in the State through ULBs in their respective region and review the implementation /status twice a year in coordination with other stakeholders. • Monitor adherence to Environmental standards as prescribed, examine proposals and authorise ULBs for SWM, monitor compliance standards as laid down in SWM Rules 2016 and offer directions for safe handling/disposal of waste at deposition centres.

Level/ Responsible Institution	Role and responsibilities of Institution in SWM
Deputy Commissioners of all districts	• Facilitate identification and allocation of suitable land to ULBs for setting up solid waste processing and disposal/treatment facilities in their jurisdiction, in coordination with State Secretary and review the performance of ULBs every quarter and take corrective measures.
Municipal authorities/ Town Committees/ Cantonment Board and traditional institutions (ADCs and Dorbar Shnongs) of census towns	• Shall prepare SWM plan as per State policy and strategy and submit to State Government. • Frame bye laws incorporating provisions of these rules and implement them effectively. • Arrange door to door collection of segregated waste from all households, including slums and informal settlements, commercial, non-residential premises, all public institutions, commercial complexes, housing boards *etc*. • Educate, enforce waste generators on five Rs (reduce, reuse, recycle, recover and remove). • Involve communities in waste management and promotion of home composting and de-centralised waste processing at community level and maintain hygienic condition. • Create public awareness through Information, Education & Communication (IEC) and educate public and involve them in SWM at critical levels regarding segregation of waste at source, littering. • Capacity building of SWM workers on all aspects to ensure implementation of the SWM Rules, 2016. • Provide bins for storage of biodegradable/non-biodegradable waste and ensure collection of waste by primary collection system, transfer them through secondary collection mechanism for disposal and treatment at landfill. • Setup material recovery facilities with sufficient space for sorting recyclable waste by waste pickers and recyclers. • Provide proper collection, disposal and set up treatment facilities for city SWM in accordance with the rules, with authorisation from the State authorities. • Implement and ensure all points as per State Policy for effective waste management services in city/ULB.

Source: Meghalaya Solid Waste Management Policy & Strategy.

The 74th Constitutional Amendment Act sought to empower ULBs to function as Local Self-Government and to deliver efficient & effective services for economic development

and social justice with regard to 18 subjects[11] listed in XII Schedule of the Constitution. In Meghalaya, functions to the urban local bodies have been carried out under the Meghalaya Municipal Act, since Meghalaya is exempted from implementation of the 74th CAA under Article 243 ZC of the Constitution. The Director, Urban Affairs Department, stated (June 2023) that Government of Meghalaya has devolved 16 functions[12] to the ULBs, but it was seen that only three[13] functions have been fully transferred and discharged[14] by the six Municipal Boards of Meghalaya of which solid waste management is one of the fully devolved functions.

This Chapter examines the efficiency and adequacy of institutional mechanisms, as well as the efficiency of the different departments/agencies in carrying out their roles.

3.2 Notification of State Policy by Urban Affairs Department

Delay in notifying the Meghalaya State Waste Management Policy and Strategy, despite the SWM Rules, 2016 reflected lackadaisical approach of Urban Affairs Department in implementing the waste management rules.

As per Rule 11 of the SWM Rules, 2016, the Secretary, Urban Affairs Department should prepare a state policy and solid waste management strategy for the State in consultation with stakeholders including representatives of waste pickers, self-help group (SHGs) and similar groups working in the field of waste management consistent with these rules, in a period not later than one year from the date of notification of the SWM Rules.

The SWM Rules were notified in April 2016 whereas the Meghalaya State Waste Management Policy and Strategy which was due to be notified in April 2017 was notified only on 17 June 2019 *i.e.,* after a delay of more than two years.

Delay in notifying the Meghalaya State Waste Management Policy and Strategy indicates lackadaisical approach of the Urban Affairs Department in the implementation of SWM Rules, 2016. As a result of the delay in notifying the Meghalaya State Waste Management Policy and Strategy, it was seen that there was a gap in the implementation

[11] 1. Urban planning including town planning; 2. Regulation of land-use and construction of buildings; 3. Planning for economic and social development; 4. Roads and bridges; 5. Water supply for domestic, industrial and commercial purposes; 6. Public health, sanitation, conservancy and solid waste management; 7. Fire services; 8. Urban forestry, protection of the environment and promotion of ecological aspects 9. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded 10.Slum improvement and upgradation 11.Urban poverty alleviation;12. Provision of urban amenities and facilities such as parks, gardens, playgrounds; 13.Promotion of cultural, educational and aesthetic aspects; 14.Burials and burial grounds; cremations, cremation grounds and electric crematoriums 15.Cattle pounds; prevention of cruelty to animals; 16.Vital statistics including registration of births and deaths; 17.Public amenities including street lighting, parking lots, bus stops and public conveniences; 18.Regulation of slaughter houses and tanneries.

[12] Except for (i) Fire Service and (ii) Urban Forestry, protection of the environment and promotion for ecological aspects.

[13] (i) Public health, sanitation conservancy and solid waste management (ii) Urban poverty alleviation and (iii) Vital statistics including birth and deaths.

[14] For Public health, sanitation conservancy and solid waste management, all the five MBs was discharging this function except Williamnagar MB.

of the SWM Rules 2016 such as non-integration of informal waste collectors in waste management, delay in imposition of user charges, *etc.* as discussed in the succeeding paragraphs.

The Department accepted the observation during the Exit Conference held on May 2023.

3.3. Framing of Bye Laws

None of the Municipal Boards in Meghalaya, and two autonomous district councils, namely, JHADC and GHADC, had framed bye-laws for implementing SWM Rules 2016, while the KHADC had only notified the Khasi Hills Autonomous District (SWM) Act, 2020 in February 2022, rendering the implementation of SWM Rules 2016 ineffective due to the absence of legally empowering bye-laws.

As per Rule 15(e) of the SWM Rules, 2016, Local authorities were required to frame bye-laws incorporating provisions of SWM Rules 2016, within one year from the date of notification of these rules.

Meghalaya State Waste Management Strategy and Policy of June 2019 stipulated that the local authorities will frame bye laws incorporating the provisions of State Policy & Strategy document for implementing the same in their respective jurisdictions.

Audit noticed that none of the Municipal Boards in Meghalaya had framed any bye-laws for implementation of SWM Rules 2016 as of 31 March 2022. Further, Audit noticed that though the ADCs were to formulate bye laws under SWM Rules 2016, JHADC and GHADC were yet to comply with these directions till the date of audit (November 2022) while the KHADC had notified the Khasi Hills Autonomous District (SWM) Act, 2020 only in 10 February 2022.

The Shillong Cantonment Board reported (January 2023) that they had forwarded the draft bye laws to the higher authority in December 2022 and were awaiting approval, it was however seen that draft bye laws of Shillong Cantonment Board were yet to be approved till January 2023.

Thus, the implementation of SWM Rules 2016 in Meghalaya remained a pipe dream in the absence of relevant bye-laws of the local authorities which would have legally empowered them to implement the SWM Rules.

3.4 Preparation of Solid Waste Management Plans by Urban Local Bodies

ULBs in Meghalaya were required to prepare comprehensive short-term and long-term Solid Waste Management (SWM) plans aligned with the State policy. However, the selected Municipal Boards, Town Committees, and Census Towns have failed to develop such plans within the stipulated timelines, with only Shillong having submitted a City Solid Waste Action Plan that awaits approval. Absence of SWM Plans indicated that ULBs had not set any short-term or long -term goals and targets absence of targets and goals for implementing the SWM Rules in Meghalaya.

As per the Municipal Solid Waste Management (MSWM) Manual, 2016 (Section 1.4.5 and 1.4.6), ULBs were required to prepare a detailed SWM plan, with short term (2-5 years) and long-term (20-25 years) actions. Short-term plans were to cover aspects of institutional strengthening, community mobilisation, waste minimisation initiatives, waste collection and transportation, treatment and disposal, and financial outlay, while long term plans were to consist of four-five short term planning cycles. Actions to be undertaken in each of these short term planning cycles should be clearly identified in the long term plans and the short term plans should lead to achievement of the long term plan. Moreover, as per the Meghalaya State Waste Management Policy and Strategy which was approved by the State Government and notified on 17 June 2019, each city/town/census town was to prepare its own Waste Management Plan which should be in tandem with the objectives of the Policy and Strategy document.

The status of preparation of plans in the selected Municipal Boards, Town Committee or Census Town is detailed in **Table 3.2**.

Table 3.2: Status of preparation of SWM plan by selected Municipal Boards, Town Committee and Census Towns

Area/ Jurisdiction	Responsible Agency	Timelines as prescribed in State Policy and Strategy document	Current Status
Shillong Municipal Area	Shillong Municipal Board	By September 2019	City Solid Waste Action Plan prepared and sent to Urban Affairs Department on 20 June 2022 but approval was awaited
Jowai Municipal Area	Jowai Municipal Board	By September 2019	Yet to be prepared
Tura Municipal Area	Tura Municipal Board	By September 2019	Yet to be prepared
Nongpoh Area	Nongpoh Town Committee	By November 2019	Yet to be prepared
Mawlai and Umpling Census Towns	Khasi Hills Autonomous District Council	By November 2019	Yet to be prepared

Source: Reply furnished by SMB, JMB, TMB, Nongpoh Town Committee and KHADC.

While the approval of City Solid Waste Management Plan (which is a short term plan) was awaited (May 2023) in case of Shillong Municipal Board, none of the other selected Municipal Boards, Town Committee or Census Town had prepared any short-term or long-term plans.

In the Exit Conference (May 2023), the Director, Urban Affairs Department stated that the City Solid Waste Action Plan was prepared (April 2023) for all the ULBs under Swacch Bharat Mission and the same was under consideration of the Ministry of Housing and Urban Affairs for approval. The Department, however did not provide any copies of the Action Plan submitted to the Ministry of Housing and Urban Affairs to audit. Also, no action was being undertaken for preparation of long term plans.

Absence of SWM Action plans of the Municipal Boards resulted in there being no short-term or long-term planned interventions for solid waste management in the urban areas of Meghalaya.

3.5 Role of Town Committees in Census Town Areas

There were no functional Town Committees in the Census Towns, under the jurisdiction of the ADCs, test checked by Audit. Lack of coordination between the Urban Affairs Department, the ADCs, and the State Pollution Control Board was evident from the non-submission of annual reports on waste management by Dorbar Shnongs under the Town Committees and Census Towns to the MSPCB. Absence of data on solid waste collection and disposal in these areas indicated that SWM Rules 2016 had not been implemented.

In Meghalaya, the Town Committees and Census Towns do not fall under the administrative control of the Urban Affairs Department. Rather, these areas (47 *per cent* of the total urban population[15]) are governed by the respective ADCs, under whose jurisdiction the Town Committees are set up. As per the Meghalaya Solid Waste Management Bye Law, 2020, the responsibility for collection, transportation, processing, of solid waste in the Census Towns outside the Municipal Area lies with local traditional institutions (called the Dorbar Shnongs) in association with ADCs.

Rule 15 (za & zb) of SWM Rules, 2016 stipulates that the local authorities and village panchayats of census towns and urban agglomerations shall prepare and submit annual reports on SWM and submit the same to the Director, Urban Affairs Department who will then forward it to the Commissioner & Secretary, Urban Affairs Department and the respective State Pollution Control Board by the 31st May of every year.

Audit found very little documentation of the SWM activities being carried out by the ADCs through Dorbar Shnongs. For example, no data was available on the number of households under the Town Committees/Census Towns, quantum of waste generated, segregated and collected, dumping sites and waste processing facilities.

During site visit of seven Dorbar Shnongs, Audit found that Dorbar Shnong were using trucks/pick up for doing house to house collection of waste. Audit also noticed that Dorbar Shnongs were collecting user charges from households for waste collection at the rate of ₹ 40 - ₹ 130 per household under the Mawlai and Umpling Census Towns. However, no user charges were collected by the Dorbar Shnongs concerned under the Nongpoh Town Committee.

In a meeting (August 2019) chaired by the Chief Secretary, the Deputy Commissioners of all concerned districts were directed to ensure timely submission of Annual Reports by all Town Committees under their respective jurisdiction. The Chief Secretary advised the concerned Deputy Commissioners and representatives of the KHADC to explore constitution of a Town Committee in each of the 12 Census Towns. He suggested that since the Dorbar Shnongs of the 10 census towns within the Shillong Urban Agglomeration are already undertaking various activities for management of

[15] Total urban population of Meghalaya – 5,95,450, Town Committee and Census Towns 2,79,680.

wastes, they may be recognised as institutional structures for implementation of waste management till a town committee is established. He further suggested that the SMB may provide necessary help to the Dorbar Shnongs of the Census Towns in preparation of the Annual Report.

However, despite the directions from the Chief Secretary in August 2019, Audit found that till date, the Town Committees (Nongpoh, Mairang and Nongstoin) and Census Towns were not submitting the annual reports to the Urban Affairs Department.

The MSPCB stated (December 2022) that the list of Town Committees and Census Towns was yet to be shared by the Urban Affairs Department and as such, monitoring of Town Committees and Census Towns was not carried out by them.

The absence of a functional Town Committees in Census towns, absence of data on SWM from the ADCs and no reporting on SWM activities as per SWM Rules 2016, are indicators that the Census Towns were still to be on boarded into the mainstream institutional framework for SWM.

As a result, the MSPCB did not have any data on the generation, collection and transportation of waste from these town committee/census town areas. This indicates absence of monitoring of the local traditional bodies by the MSPCB and also lack of coordination between the Urban Affairs Department and the ADCs in the implementation of SWM Rules, 2016.

3.6 Preparation of Contingency Plans

The failure of the test-checked urban areas in Meghalaya to develop contingency plans for waste storage, as stipulated by the MSWM Manual 2016, left them unprepared to address unforeseen crises like waste transportation disruptions and waste accumulation on streets of Jowai leading to public protest.

MSWM Manual 2016 (Section 5.4) stipulated that ULBs should prepare contingency plans for appropriate storage of waste, to tide over situations of non-performance of processing/treatment/disposal facilities. Requirement of a contingency plan was neither envisaged in the Meghalaya State Waste Management Policy and Strategy nor addressed by any of the test-checked urban areas. As a result, ULBs were not prepared to tackle any unforeseen situation or crisis such as public protest in Jowai Municipal Area when the villagers did not allow passage of waste transportation vehicles, resulting in piling up of waste on streets, which is discussed in **Para 6.4.3.2**.

3.7 Periodical review of SWM Rules by Urban Affairs Department

Though the Urban Affairs Department in charge of implementing SWM and Plastic Waste Management Rules established State Level Advisory Committees for periodic review of implementation of SWM Rules 2016, absence of records of such meetings indicated that these committees were largely non-functional.

As seen from **Table 3.1**, Urban Affairs Department was responsible for overall implementation and enforcement of SWM Rules, 2016. Moreover, Rule 23 of the SWM Rules, 2016 stipulates that the Department in-charge of local bodies of the concerned

State Government shall constitute a State Level Advisory Body within six months from the date of notification (April 2016) of these rules.

Scrutiny of records revealed that the Urban Affairs Department vide Notification No UAU.9/2015/565 dated 25 April 2017 constituted the State Level Advisory Committee chaired by the Commissioner & Secretary, Urban Affairs Department. The State Level Advisory Committee was to meet at least once in every six months to review the matters related to implementation of the SWM rules, 2016.

Similarly, scrutiny of records revealed that the Urban Affairs Department vide Notification No UAU.70/2016/81 dated 25 January 2018 constituted the State Level Advisory Committee for monitoring of Plastic Waste Management Rules, 2016 chaired by the Commissioner & Secretary, Urban Affairs Department. The State Level Advisory Committee was to meet at least once in every six months for the purpose of effective monitoring of implementation of the Plastic Waste Management Rules 2016.

However, the Director, Urban Affairs Department failed to produce any records showing the number of meetings being conducted by the two Advisory Boards during the period covered by Audit and copy of minutes of meetings held by these Committees (if any), was also not furnished though called for (June 2022[16]). In absence of such basic information/ records, Audit could not ascertain whether proper monitoring has been ensured in the implementation of the SWM Rules, 2016 and the Plastic Waste Management Rules, 2016 by the State Level Advisory Committees.

3.8 Assessment of waste generation in urban areas

A comprehensive assessment of waste generation using well-defined metrics is crucial for effective Solid Waste Management; however, lack of reliable data collection and periodic surveys in urban areas, along with discrepancies in waste estimation methods, indicated deficiencies in planning and coordination.

A comprehensive assessment of waste generation determined by well-defined metrics is imperative for efficient Solid Waste Management. Section 1.4.3.3.1 of the Solid Waste Management Manual, 2016 stipulates that the average amount of waste disposed by a specific class of generators may be estimated by averaging data from several samples to be collected continuously for a period of seven days at multiple representative locations within the jurisdiction of the ULB, in each of the three main seasons *viz.* summer, winter and rainy season. Waste should then be aggregated over the seven-day period, weighed and averaged. These quantities could then be extrapolated to the entire ULB/urban area and per capita generation assessed. This should be repeated once every 3-5 years.

Under the NERCCDIP, Shillong, the capital city of Meghalaya, was to be provided with the SWM facilities including an engineered sanitary landfill site with improvements in primary and secondary collection, transportation and disposal. In connection with the programme, it was required to quantify and characterize municipal solid waste from residential and institutional sources. As such, Audit noticed that survey for quantification and characterisation of waste (Solid Waste Quantification & Characterisation study)

[16] Reminders were also issued during September 2022 & February 2023, but reply was not furnished.

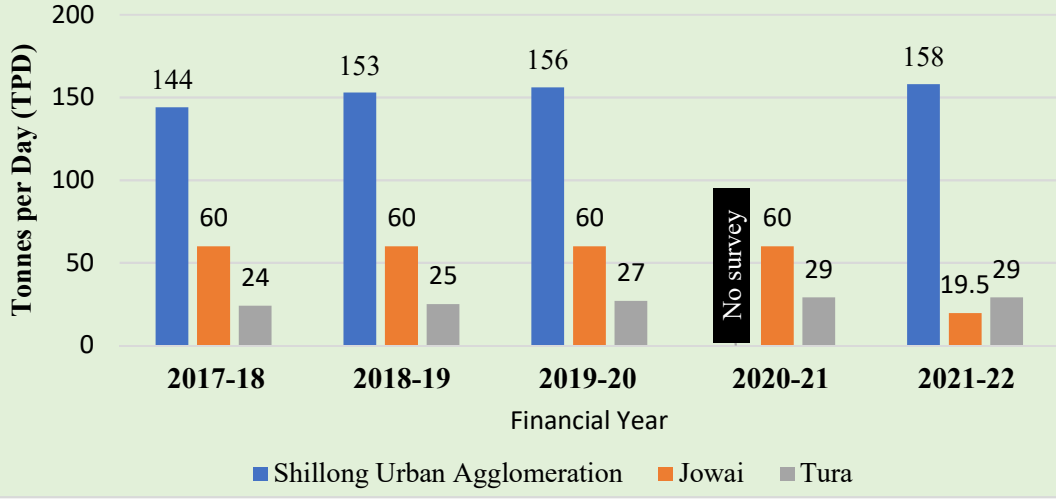
was conducted for the Shillong Urban Agglomeration (SUA) area by the Department of Environmental Studies, North Eastern Hills University during 2010-11. During the period covered by audit (except for 2020[17]) annual surveys on waste generation, segregation at source and transportation in the Shillong Urban Agglomeration (SUA) area were conducted by SIPMIU. There were no records, however, to indicate that these annual survey reports were submitted by SIPMIU to MSPCB or Urban Affairs Department. As a result, neither the MSPCB nor the Urban Affairs Department used these reports for extrapolation of per capita SWM generation resulting in lack of viable data.

As per Section 1.4.3.3.1 of the Solid Waste Management Manual 2016, the practice of an eye estimate of waste quantity transported is not reliable as many times, trucks carrying waste are half full or carry light material. Further, the quantity of waste measured at transfer stations or processing and disposal sites also does not accurately reflect waste generation rates, since these measurements do not include waste disposed at unauthorised places, waste recovered by informal waste collectors or waste pickers from the streets, bins, and intermediate transfer points, *etc.*

No surveys were conducted in Jowai, Tura and Nongpoh municipal areas, Audit noticed that for these areas, assessment of per capita waste generation was arrived at based on approximation of quantity of transported waste. Thus, it implies a lack of reliable data and absence of planning mechanism in the ULBs and Town Committee with regards to SWM as discussed in the succeeding paragraph.

Per day waste generation in the test checked urban areas[18] for the period from 2017-18 to 2021-22 as per the survey conducted by SIPMIU in Shillong Urban Agglomeration and assessment by per capita based estimates and/or estimation of quantity of transported waste information in Jowai and Tura[19] is given in **Chart 3.1**.

Chart 3.1: Status of waste generation in Shillong Urban Agglomeration, Jowai and Tura from 2017-18 to 2021-22



Source: Information furnished by SIPMIU, JMB and TMB.

[17] Due to Covid-19 pandemic.

[18] Shillong Municipal Area, Census Towns within Shillong Urban Agglomeration but outside Shillong Municipal Area, Jowai Municipal Area, Tura Municipal Area, Nongpoh Town.

[19] Data was not available with respect to Nongpoh town.

During Exit Conference (17 May 2023), the Department stated that during the preparation of the City Solid Waste Action Plan under SBM, a survey on quantum of waste generated was conducted in all Municipal areas recently. However, on being asked whether this is a regular periodical exercise, the Department stated that the current exercise was solely done for the purpose of preparation of the Action Plan. However, the Department will consider conducting periodical surveys.

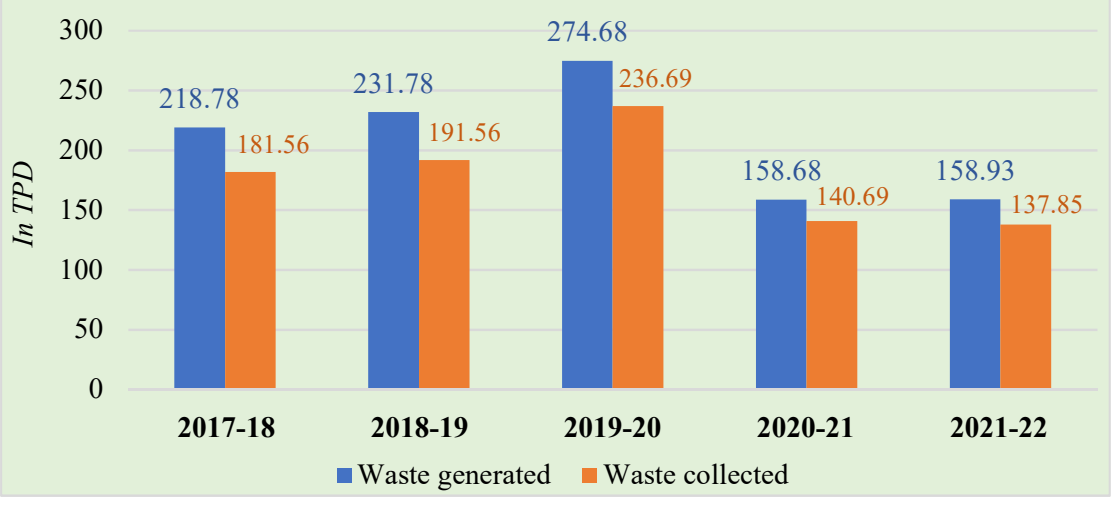
3.9 Maintenance of SWM data by MSPCB

The effective management of solid waste relies on accurate data collection and analysis, yet discrepancies between waste generation and collection figures reported by the Meghalaya State Pollution Control Board and information provided by tested Urban Local Bodies, along with the absence of data from Town Committees and Census Towns, underscore issues of data accuracy, completeness, and reliability.

As per Section 6.1.3 of the SWM Manual 2016, collection and analysis of data related to SWM is required to assess the existing situation and propose adequate measures for improving service delivery. A good management information system helps in establishing a strong and reliable information database necessary to facilitate planning, midcourse corrections, and decision making. Further, as per Rule 15 (zb) of SWM Rules 2016, the annual reports prepared by the ULBs shall be sent to the Secretary -in-Charge of the State Urban Development Department and to the respective State Pollution Control Board by the 31st May of every year.

As per information obtained from MSPCB, the position of waste generation and collection in the six ULBs of Meghalaya for the audit period is shown in **Chart 3.2** below. It may be mentioned here that MSPCB does not collect the data on waste generation and collection from town committees and census towns.

Chart 3.2: Position of waste generation and collection in the six ULBs of Meghalaya from 2017-18 to 2021-22



From **Chart 3.2**, it could be seen that there was an increase of nine *per cent* of waste generation per day between 2017-18 and 2019-20. However, closer scrutiny of the figures revealed that there were discrepancies between the data shown by MSPCB in their Annual Reports and the figures furnished by the test checked ULBs to Audit.

A comparison of data shown by MSPCB and data provided to audit by the test-checked ULBs (Shillong, Jowai and Tura Municipal Boards) with regards to waste generation and collection for the audit period is shown in **Table 3.3 and Table 3.4**.

Table 3.3: Comparison of quantum of waste generated in the test-checked ULBs with MSPCB data

(in TPD)

Year	SMB		JMB		TMB	
	As per MSPCB	As per information furnished to audit by ULBs	As per MSPCB	As per information furnished to audit	As per MSPCB	As per information furnished to audit
2017-18	56.08	62	56	60	65	24
2018-19	56.08	66	60	60	75	25
2019-20	59.95	69	60	60	75	27
2020-21	59.95	NA	19.50	60	35	29
2021-22	85.40	70	19.50	19.50	35	29

Table 3.4: Comparison of quantum of waste collected in the test-checked ULBs with MSPCB data

(in TPD)

Year	SMB		JMB		TMB	
	As per MSPCB	As per information given to audit	As per MSPCB	As per information given to audit	As per MSPCB	As per information given to audit
2017-18	44.86	59	50	60	45	23
2018-19	44.86	62	56	60	50	23
2019-20	50.96	63	56	60	50	23
2020-21	50.96	DNA	15.50	60	30	23
2021-22	68.32	67.50	15.50	Not Available	23	23

During the Exit Conference (May 2023), the Member Secretary, MSPCB admitted that the MSPCB was collecting the data from different ULBs but they had no mechanism to verify the validity of information. Moreover, the MSPCB did not collect data from the Town Committees and Census Towns which means that the data maintained by MSPCB was neither complete nor reliable.

3.10 Availability of supervisory posts for SWM purposes

The inadequate availability of supervisory staff, falling significantly short of the recommendations outlined in the MSWM Manual 2016, has adversely affected the ability of the selected Urban Local Bodies and Town Committee in Meghalaya to effectively manage solid waste activities, including collection and disposal.

Section 1.4.5.4 of MSWM Manual, 2016 strongly recommends that ULBs should have an SWM cell or SWM department having staff with technical and managerial skills specific to MSW management. Based on an expert committee report, the MSWM manual recommended hiring professionals in MSW services to scientifically manage the waste issues.

The recommendations from the expert committee report are given below:

❖ Towns below 1 lakh Population

One experienced Junior Engineer, if the population is more than 50,000 or in places with high floating population.

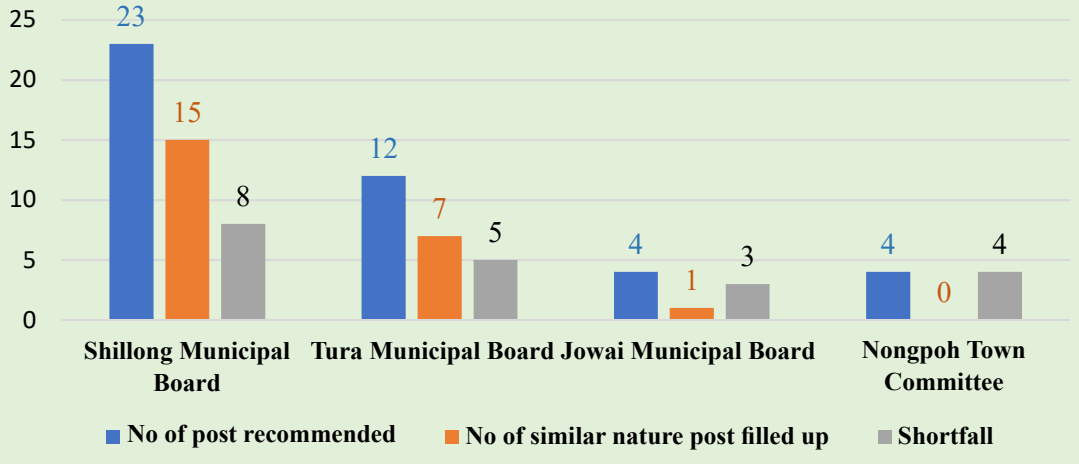
- One qualified sanitation diploma holder or Chief Sanitary Inspector or as Sanitary Officer if the population is more than 50,000.
- One qualified Sanitary Inspector per 50,000 population.
- One qualified Sanitary Sub-inspector per 25,000 population.
- One Sanitary Supervisor per 12,500 population.

❖ Cities between 1 and 2.5 lakh Population

- One experienced graduate engineer or Equivalent Health Officer.
- One experienced Junior Engineer per 1 lakh population.
- Qualified sanitation diploma holder Chief Sanitary Inspector or
- Sanitation Officer to look after the collection, transportation, processing and disposal of waste.
- Qualified sanitation diploma holder Sanitary Inspector: 1 per 50,000 population.
- Qualified sanitation diploma holder Sanitary Sub-inspector: 1 per 25,000 population.
- Sanitary Supervisors (a person who can read, write, and report): 1 per 12,500 population.

The position of supervisory staffing in the test checked ULBs/Town Committee *vis-à-vis* the recommendations of the MSWM manual are shown in **Chart 3.3**.

Chart 3.3: ULB wise position of supervisory staff vis-a-vis the recommendations of the MSWM Manual 2016



It is seen from the **Chart 3.3** that there was shortage of supervisory posts in all the selected ULBs and Town Committee ranging from 35 *per cent* (SMB) to 100 *per cent* (Nongpoh Town Committee). Details of the position of supervisory posts is shown in **Appendix II**. The shortage of personnel had an adverse impact on the ULBs ability to

meet the rigorous demands of SWM activities, particularly collection and disposal of solid waste in ULBs.

3.11 Training of SWM Staff

Unsatisfactory training and capacity-building initiatives for staff involved in Municipal Solid Waste Management activities across various selected Urban Local Bodies in Meghalaya, resulted in operational inefficiencies and issues like mixing of segregated waste during collection, transportation, and processing.

As per clause 1.4.5.5 of Municipal Solid Waste Management (MSWM) Manual, 2016, there is an urgent need to train and enhance the capacities of staff in MSWM activities since capacity building of staff is essential for enhancing their skills for monitoring provision of SWM services. The various capacity building approaches that can be adopted by the ULBs for different stakeholders are shown in **Chart 3.4**.

Chart 3.4: Capacity building of SWM Staffs

Source: MSWM Manual 2016.

❖ *Training in Shillong Municipal Board*

Scrutiny of records revealed that in Shillong, training to SMB staff on the above topics had been imparted by SIPMIU. Though training was imparted to SWM staff in SMB, it was seen that municipal staff engaged in collection and transport of municipal waste ended up mixing all the waste at the collection stage, even if the same was segregated by the households. Thus staff seemed to be unaware and untrained for keeping the waste segregated at the collection stage.

Exhibit 3.1 Unsegregated garbage being dumped into a compactor

❖ *Training in Tura Municipal Board*

In TMB, training had been imparted for senior officers, collection and transportation staff but no training was provided to staff at processing plant.

❖ *Training in Jowai Municipal Board*

In JMB, no training was imparted to staff regarding collection, transportation and processing. As a result, there was mixing of segregated waste during collection and transportation in Jowai.

❖ *Training in Nongpoh Town Committee*

No training was conducted in Nongpoh Town Committee since no staff has been employed for the purpose of SWM by Nongpoh Town Committee. The respective Dorbar Shnongs of Nongpoh Town are managing the SWM activities on their own. There was nothing on record to indicate that these Dorbar Shnongs of Nongpoh were trained in any of the above parameters.

3.12 Integration of informal waste collectors in waste management

The recognition and integration of the informal waste sector, including waste pickers and collectors, into the formal waste management system has been inadequately addressed in Meghalaya.

SWM Rules, 2016 (Clauses 11(c) and 15(c)) and MSWM Manuals, 2016 (Section 2.3.7) acknowledged the primary role played by the informal sector of waste pickers, waste collectors and recycling industry in reducing waste. SWM Rules, 2016 requires the State Government to provide broad guidelines regarding integration of waste pickers or informal waste collectors with the waste management system. The ULBs are expected to establish an integrated system involving informal organisations of waste pickers or

informal waste collectors and facilitate formation of Self Help Groups (SHGs) to promote community participation in solid waste management including door to door collection of waste.

There were several examples of good practices being adopted by ULBs in small and medium cities, one such study being done by the Niti Aayog[20].

Best Practices - Ambikapur

Before 2015, Ambikapur displayed the usual manifestations of a town – overflowing community bins and waste dumped indiscriminately near roads, streets and a garbage mountain containing legacy waste. With the intervention of the local administration and women self-help groups and inspired by the concept of the Garbage Clinic Model, the city is now able to achieve 100 *per cent* segregation, collection and processing of waste. The waste is brought to the Solid and Liquid Resource Management (SLRM) Centre, where the recyclables are first extracted into 20 inorganic fractions by secondary segregation, followed by 156 categories in the tertiary segregation. The legacy waste dumpsite is cleared by the urban local bodies and now being used as waste recycling centre.

Source: NITI Aayog's Waste Wise Cities- Best Practices (Pg-24).

It was observed that though the Meghalaya State Waste Management Policy and Strategy (2019) proposed utilising the services of NGOs/ SHGs to provide support to the informal sector, no guidelines were issued by the Urban Affairs Department in this regard. In the test checked municipal boards and town committee, only one SHG *viz.,* Ianehskhem SHG was recognised by Shillong Municipal Board. The other test-checked urban areas (TMB, JMB and Nongpoh Town Committee) failed to recognise organisations of informal waste collectors and integrate them in SWM.

During the Exit Conference (May 2023), the Department while accepting the audit finding, stated that the matter will be taken up with all Municipal Boards to come up with likely strategies for the integration of the informal sector with the governmental interventions in SWM.

3.13 Achievement of Service Level Benchmark

Service Level Benchmarking initiative launched by the Ministry of Urban Development aims to monitor urban services, but despite notification for Shillong Municipal Board, SLBs for other Municipal Boards were not established, and SMB's performance in meeting SLB targets was generally below benchmarks.

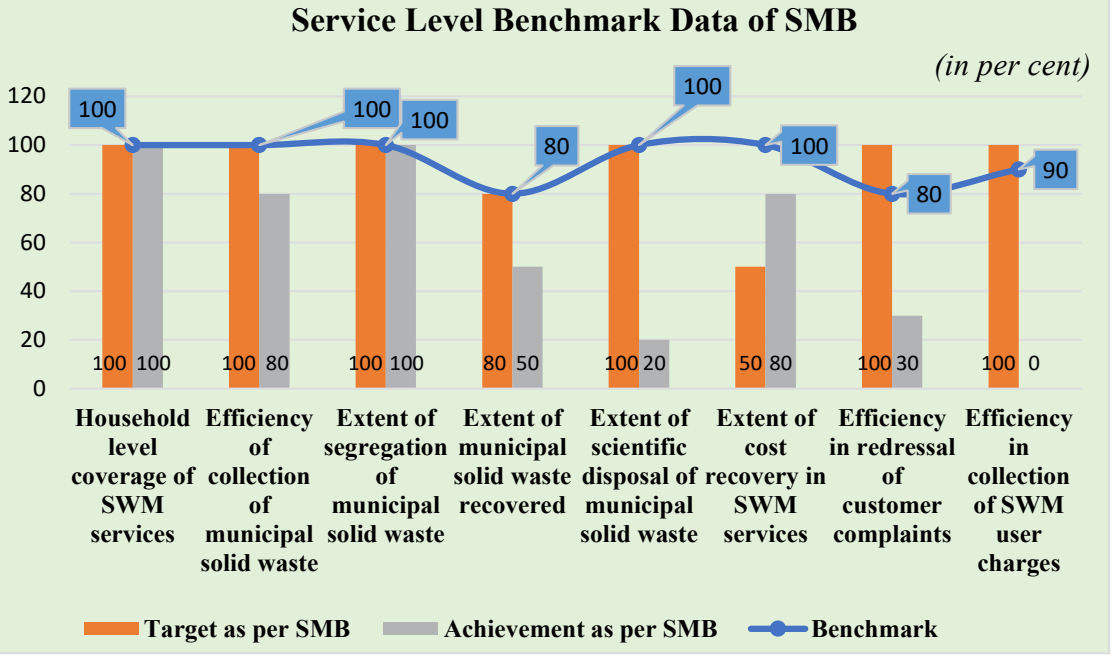
Ministry of Urban Development (MoUD), Government of India, launched (2008) the Service Level Benchmarking (SLB) initiative covering water supply, waste water, SWM and storm water drainage. The 13th and 14th FCs have also endorsed the principle of benchmarking and included SLB as one of the conditions for the allocation

[20] NITI Aayog's Waste Wise Cities- Best Practices, (2021).
(website link - *https://www.niti.gov.in/sites/default/files/2021-12/Waste-Wise-Cities.pdf)*

of performance-based grants to ULBs. MoUD defined (2008) a common minimum framework for monitoring and reporting on performance indicators;

As mentioned in Chapter 2 of Annual Technical Inspection Report (ATIR) 2016-17, the State Government notified the SLBs for four basic services *viz.,* (i) water supply, (ii) sewerage, (iii) storm water drainage and (iv) solid waste management in March 2012. However, these SLBs were notified only for Shillong Municipal Board. It has still not notified the SLBs for the other five[21] MBs. The extent of achievement by the SMB (submitted in June 2022) *vis-a-vis* the targets and benchmarks are shown in **Chart 3.5**.

Chart 3.5: Targets and achievement of Shillong Municipal Board (SMB) in June 2022



Source: Information furnished by Shillong Municipal Board.

It is evident from the **Chart 3.5** that SMB has set targets at par with the Benchmark except for 'extent of cost of recovery in SWM services', where SMB had set a lower target of 50 against the benchmark of 100, 'efficiency in redressal of customer complaints' where SMB had fixed a higher target of 100 as compared to the benchmark of 80 and 'efficiency in collection of SWM user charges' where SMB had fixed a higher target of 100 against the benchmark of 90. As per the SMB's declarations, efficiency of collection, extent of recovery, extent of disposal, and collection of user charges were below the targets/benchmarks.

Audit verified the claims made by SMB regarding achievement of Service Level Benchmarks with that of annual survey data conducted by SIPMIU. It was noticed that the SIPMIU data showed a lower achievement of targets for collection of waste (74 *per cent*) and segregation at source (70 *per cent*) during 2022 as against the claim of 80 *per cent* and 100 *per cent* made by SMB respectively.

[21] Jowai, Tura, Williamnagar, Baghmara and Resubelpara MBs.

3.14 Conclusion

The function of Municipal Waste Management in the state of Meghalaya is severely hampered due to weak institutional mechanism that is manifested in none of the multiple agencies involved in this process being compliant with the responsibilities assigned to them under the Meghalaya SWM Rules. SWM functions are further hampered by the fact that though a state wise policy has been put in place, none of the agencies involved, *i.e.* Municipal Boards, Cantonment Board (in Shillong) and Autonomous District Councils had formulated their Bye Laws respectively. The Town Committees were found to be practically non-existent as a result of which habitations covered under the census towns were completely deprived of functional waste management systems. At the government level, Urban Affairs department was hamstrung with lack of data on municipal waste generation to be in any position to take effective policy based initiatives to handle the municipal waste scientifically and effectively. Periodic Surveys for assessment of waste generation was not conducted in the test checked ULBs/Town Committee except in Shillong. As a result, inaccurate methods of evaluation such as per capita estimation and estimation of quantity of transported waste was adopted in Tura and Jowai. Data was unavailable for Nongpoh Town with regard to waste generation, segregation, collection, and disposal from 2017-18 to 2020-21. Similarly, MSPCB's role making effective intervention in controlling pollution in and around dumping ground seemed ineffective since it had no reliable data on waste generated and collected.

Waste Management Plans (either short term or long term) were not prepared in the test checked ULBs/Town Committee except for Shillong Municipal Area, where a City Solid Waste Action Plan had been prepared by the Shillong Municipal Board (SMB) but the same was still awaiting approval. A contingency plan was neither envisaged in the Meghalaya State Waste Management Policy and Strategy nor addressed by any of the test checked ULBs/Town Committee. These delays in preparation and approval of requisite legislations and plans had inhibited the implementation of SWM activities. Further, shortage of supervisory staff in the Municipal Boards and Town Committees as well as lack of trained staff for collection and transport of municipal waste resulted in unscientific management of municipal waste in the urban areas.

Recommendations:

1. ***The State Government may ensure that the required Bye laws under the Solid Waste Management Rules, 2016 are framed and implemented by the ULBs and ADCs in the State. The State Government may take up the matter with Shillong Cantonment Board for effective implementation of the SWM Act and Rules.***
2. ***The Urban Affairs Department needs to assist ULBs/ local traditional bodies involved in SWM for preparation of Long-term, Mid-term and Short-term action plans to enhance the efficacy of solid waste management.***

3. ***The Urban Affairs Department should encourage and promote involvement of informal sector in solid waste management (SWM) activities to increase efficiency of SWM.***
4. ***Considering the intricate administrative framework encompassing agencies engaged in solid waste management (SWM) activities within urban areas of Meghalaya, it is imperative for the State Government to establish robust coordination among these entities and ensure vigilant monitoring of the diverse provisions pertaining to SWM.***

CHAPTER-IV

FINANCIAL MANAGEMENT

Chapter-IV
Financial Management

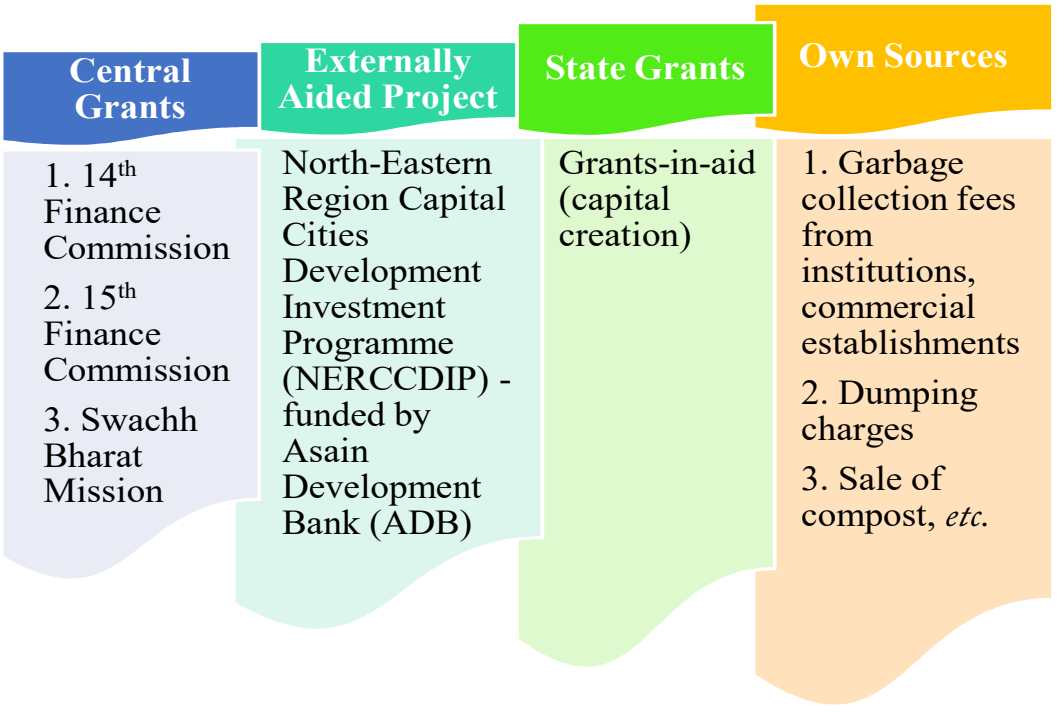
4.1 Introduction

Availability of sufficient and sustainable financing is key to the success of SWM activities. Ideally, the Municipal bodies and other local government institutions involved in managing municipal waste should be able to raise enough resources through user charges to be able to meet the expenditure pertaining to SWM activities.

This Chapter looks at the financial management of the State with regards to SWM activities.

Chart 4.1 provides an overview of various sources of financing available for solid waste management.

Chart 4.1: Sources of funds for SWM activities in Meghalaya

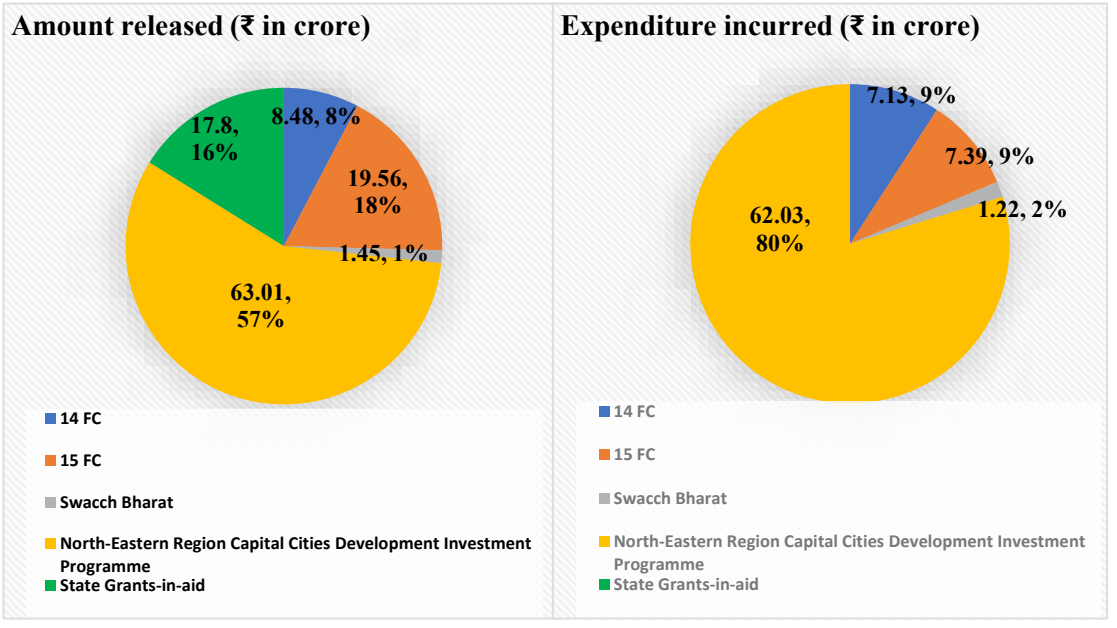


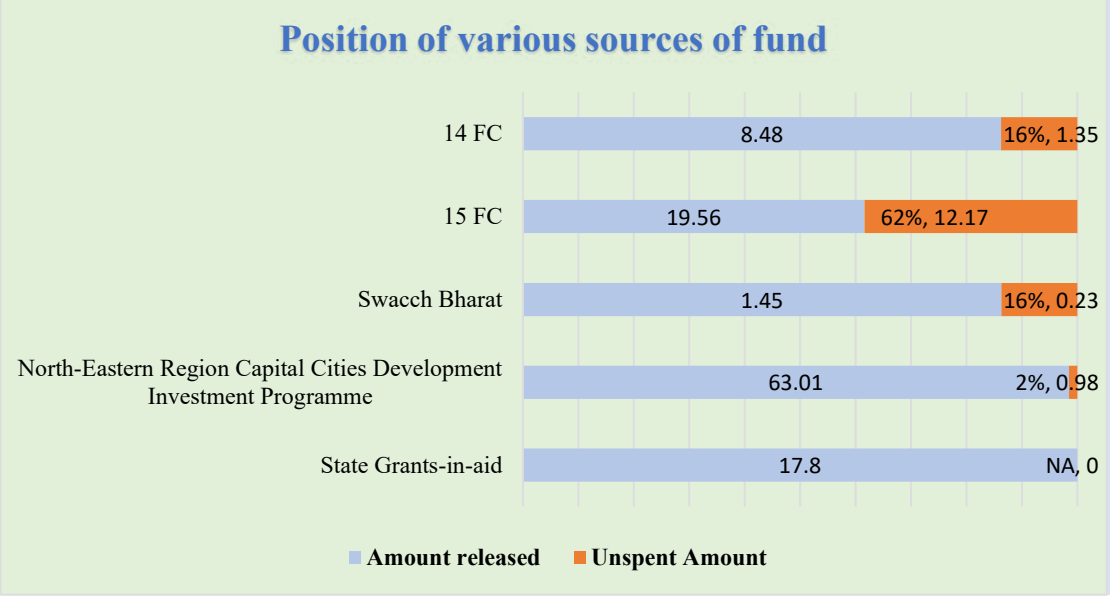
4.2 Sources of funds

During the period from 2017-18 to 2021-22 in Meghalaya, the State Government heavily relied on external funding from Asian Development Bank and Central grants, while the budgetary support from the State budget as agencies' own resources contributed only a minor share towards financing of Solid Waste Management activities.

Source-wise details of funds received, and expenditure incurred for SWM purposes in Meghalaya during 2017-18 to 2021-22, are shown in **Chart 4.2**.

Chart 4.2 : Funds released and expenditure incurred on SWM activities during 2017-2022





Source: Information furnished by Department/ULBs. However, information on expenditure incurred under State GIA was not furnished.

4.2.1 Dependence on ADB and Central Grants

During the five years period of 2017-18 to 2021-22 under audit, funds to the tune of ₹ 110.30 crore were allocated towards solid waste management in the State. As seen from **Chart 4.2** above, out of the total funds available, ₹ 63.01 crore. *i.e.* 57 *per cent*, were received as part of the externally aided project of the ADB funded NERCCDIP[22].

[22] The Government of Meghalaya, Finance (Economic Affairs) Department, vide Notification dated 05 January 2009 constituted the State Investment Project Management and Implementation Unit (SIPMIU) in Meghalaya for implementation of the North Eastern Region Capital Cities Development Investment Programme (NERCCDIP).

The objective of the NERCCDIP funding was to assist the State Government in providing the people living in the city with access to better urban services especially in the Solid waste management services and to help create citizens' awareness and behavioural changes with regards to waste management. The NERCCDIP funding was primarily for activities like construction of landfill, Compost plant at Marten, Shillong, procurement of Vehicles and equipment such as metal containers, bins, loaders *etc.* for SWM works, as detailed in **Table 4.1**.

Table 4.1: Primary projects implemented under NERCCDIP

(₹ in crore)

Sl. No.	Project component	Estimated Cost	Expenditure incurred
1.	Construction of Sanitary Landfill site at Marten	4.74	4.43
2.	Procurement of Primary and Secondary Collection Vehicles and Workshop Machineries for SMB area	1.37	1.31
3.	Procurement of different types of Bins and Personal Protective Equipment (PPE) for SMB area	1.90	1.90
4.	Construction of Garage cum Workshop shed and staff rest room at Marten	2.18	2.14
5.	Procurement of equipment for Landfill site and Compost Plant, Shillong	2.02	1.69
6.	Construction of additional landfill area of 8500 sq. m. and ancillary works at Marten	19.33	19.32
7.	Procurement of Equipment and Vehicles for Waste Management at Shillong	4.90	0.48
8.	Procurement of Primary and Secondary Refuse Collection Vehicles and Metal Containers for SWM in Greater Shillong	9.85	9.20
9.	Procurement of different types of Bins and PPE for SWM in Greater Shillong	6.70	6.53
10.	Construction of Civil Works and Supply, Installation, Testing, Commissioning and Trial Run of Mechanical Equipment of 170 TPD Compost Plant	16.32	16.24

Source: Information furnished by SIPMIU.

Thus, the funding support under this project was in the nature of one-time expenditure on construction of sanitary landfill, purchase of vehicles & equipment and construction of compost plant. However, there was no evidence available to ascertain the resources available for sustainable functioning of the vehicles and equipment purchased. In addition, the Sanitary Landfill in Marten is facing a reduced design life due to poor processing capability of the Compost Plant as discussed in **Para 6.4.3**. It is also pertinent to mention that the vehicles are 5-7 years old as they were purchased in 2015 and 2017 and may require more extensive maintenance in the near future. Further, the state received ₹ 29.49 crore, *i.e.* 27 *per cent* of the total funds, under 14 Finance Commission[23], 15th Finance Commission[24] and Swachh Bharat Mission (Urban).

[23] Procurement and repair of vehicles for Jowai, Tura, Williamnagar and Resubelpara Municipal Boards, Procurement of bins for Jowai, etc.

[24] Setting up of Bio Medical Waste Treatment Facility at Shillong, Tura, Williamnagar, Procurement of Garbage Tipper Trucks and other machineries for Jowai, Tura, Williamnagar and Baghmara Municipal Boards, etc.

Therefore, most of the SWM infrastructure funded by way of Central Grants during the audit period may not be sustainable in the long run without significant investment from the State Government for maintenance of the same.

The utilisation of funds during the period covered by audit under these schemes was to the extent of 84 *per cent* (14 FC), 38 *per cent* (15 FC), 84 *per cent* (Swachh Bharat) and 98 *per cent* (NERCCDIP) respectively as shown in **Chart 4.3,** reasons for low utilisation of 15 FC grants during the period covered by audit was due to delay in transfer of 1st instalment by GoM to the ULBs. Though GoI released the 1st instalment of 15 FC grants on 19 May 2020 (Untied grants) and 05 November 2020 (Tied grants), the State Government released the untied grants only on 22 January 2021 and the tied grants on 23 February 2022 after a delay of 248 days and 475 days respectively.

The budgetary support from the State's budget for SWM was ₹ 17.80 crore (16 *per cent*), during the five-year period.

Thus, on one hand the State was heavily dependent on external sources for financing the activities of SWM, on the other hand, the resources available were mostly tied to specific conditions. State's own budgetary support being meagre, this model of financing indicated a non-sustainable funding pattern for the SWM functions in the State.

4.3 Municipal Finances

The financial resources of the six Municipal Boards in Meghalaya from 2017-18 to 2021-22, primarily consisted of their own revenue, Central Finance Commission transfers and State Grants-in-aid, but a significant gap between operating revenue and operating expenses for Solid Waste Management activities exists due to insufficient collection of user charges, indicating the need for improved revenue generation and strict enforcement of SWM charges.

4.3.1 Overview of MB wise sources of revenue

The 74th Constitutional Amendment Act sought to empower ULBs to function as Local Self-Government and to deliver efficient & effective services for economic development and social justice with regard to 18 subjects[25] listed in XII Schedule of the Constitution. In Meghalaya, functions to the urban local bodies has been carried out under the Meghalaya Municipal Act 1973. Though the Director, Urban Affairs Department stated (June 2023) that Government of Meghalaya has devolved 16 functions[26] to the ULBs, it

[25] 1. Urban planning including town planning; 2. Regulation of land-use and construction of buildings; 3. Planning for economic and social development; 4. Roads and bridges; 5. Water supply for domestic, industrial and commercial purposes; 6. Public health, sanitation, conservancy and solid waste management; 7. Fire services; 8. Urban forestry, protection of the environment and promotion of ecological aspects 9. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded 10.Slum improvement and upgradation 11.Urban poverty alleviation;12.Provision of urban amenities and facilities such as parks, gardens, playgrounds; 13.Promotion of cultural, educational and aesthetic aspects; 14.Burials and burial grounds; cremations, cremation grounds and electric crematoriums 15.Cattle pounds; prevention of cruelty to animals; 16.Vital statistics including registration of births and deaths; 17.Public amenities including street lighting, parking lots, bus stops and public conveniences; 18.Regulation of slaughter houses and tanneries.

[26] Except for (i) Fire Service and (ii) Urban Forestry, protection of the environment and promotion for ecological aspects.

was seen that only three[27] functions have been fully devolved and discharged[28] by the six Municipal Boards of Meghalaya of which solid waste management is one of the fully devolved functions. As such, it was expected that the State had put in place mechanisms for devolution of funds to the ULBs with respect to the functions devolved.

Audit noticed that the State Government is yet to set up the State Finance Commission even though the notification for the same has already been given in March 2012. Thus, there was no formal mechanism for the devolution of funds to the Municipal Boards.

Further, under Section 68 of the Meghalaya Municipal Act, 1973 (as amended), the MBs can impose within their limits, taxes on holdings (property tax), water tax, light tax, latrine tax, drainage tax, private markets tax, fees on carts, carriages and animals, registration fees for dogs and cattle and any other tax, toll and fee duly sanctioned by the Government.

However, the power to raise taxes by the Municipal Boards is limited due to absence of an elected Board. In Meghalaya, elections for the Municipal Boards have not been held ever since their formation[29].

Besides their own revenue, the MBs also receive Central Finance Commission (CFC) grants and State Government grants released through the Director, Urban Affairs Department for salary, maintenance and development purposes.

The overall financial position of all the six MBs during the period from 2017-18 to 2021-22 is tabulated below:

Table 4.2: ULB resources

(₹ in crore)

Source	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Own Revenue	13.95	15.72	12.80	11.74	10.87	65.08
State Grants-in-Aid	4.50	8.54	6.07	20.67	49.20	88.98
Central Finance Commission (CFC) transfers	5.49	Nil	Nil	43.04.	21.19	69.72
Total	**23.94**	**24.26**	**18.87**	**75.45**	**81.26**	**223.78**

It could be seen from the above that out of total receipts of ₹ 223.78 crore during 2017-22, ₹ 65.08 crore (29 *per cent*) was from their own revenue, ₹ 69.72 crore (31 *per cent*) was from CFCs while ₹ 88.98 (40 *per cent*) was from State Grants-in-Aid.

4.3.2 Resource gap for SWM in Municipal Boards

In order for the MBs to become self-sufficient in meeting operation and maintenance costs of SWM, it is desirable that the ULBs are able to generate sufficient revenue from their own resources. Strict enforcement of levy and collection of SWM charges is essential.

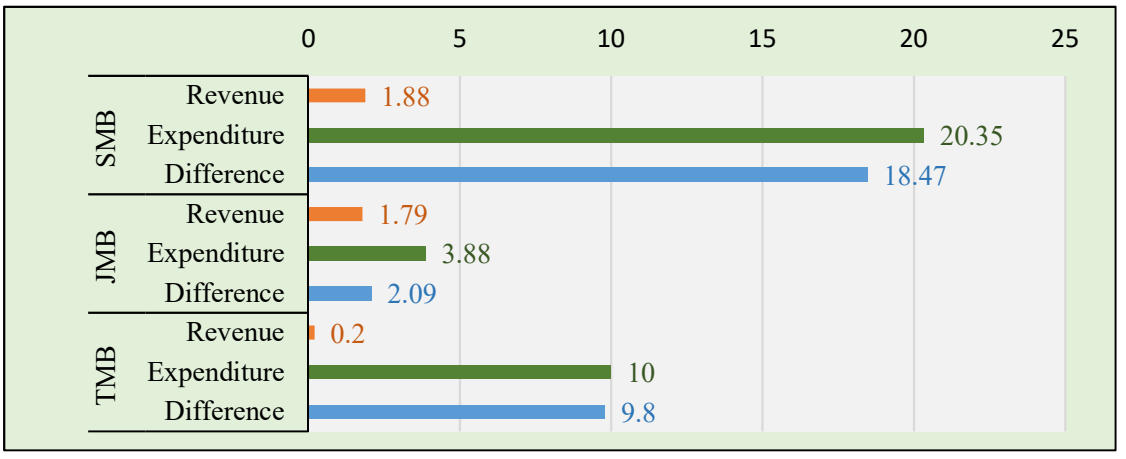
[27] (i) Public health, sanitation conservancy and solid waste management (ii) Urban poverty alleviation and (iii) Vital statistics including birth and deaths.

[28] For Public health, sanitation conservancy and solid waste management, all the five MBs was discharging this function except Williamnagar MB.

[29] Year of formation of SMB – 1913; TMB-1979; JMB-1995; WMB-1995; BMB-1995; RMB – 1997.

Test check of municipal finances[30] revealed that revenue receipts[31] under SWM in the three test checked ULBs was not adequate to meet their revenue expenditure[32] for the period from 2017-18 to 2021-22 as shown in **Chart 4.4**.

Chart 4.4: Resource Gap for SWM activities in selected ULBs for the period from 2017-22 (₹ in crore)



SMB, JMB and TMB could recover 9, 46 and 2 *per cent* respectively of the O&M costs. Compared to SMB and TMB, JMB fared relatively better in recovering the O&M costs. One of the main reasons for less recovery of O&M costs by SMB and TMB was due to non-levy of user charges from households which is discussed in the succeeding paragraph.

4.4 Collection of User charges

Despite the provision in SWM Rules and local bye-laws for the collection of user fees from households to cover solid waste management costs, most Municipal Boards did not collect user fee resulting in a significant loss of potential revenue that could have helped offset operating losses incurred in SWM activities.

Rule 15 (f) read with Rule 3 (54) of the SWM rules 2016 stipulates that the local authorities shall prescribe from time-to-time user fee and collect the fee from the waste generators on its own or through authorised agency to cover full or part cost of providing solid waste collection, transportation, processing and disposal services. As per Clause 16 of the Meghalaya Solid Waste Management Bye Law, 2020 which was notified by the Urban Affairs Department on 19 May 2020, an amount of ₹ 50 per household per month was to be charged by the local authorities *viz.* ULBs.

During audit, it was seen that Jowai Municipal Board was collecting user fees from the households for collection of solid waste. During the period from 2017-18 to 2021-22, out of total assessed User Fee of ₹ 2.67 crores, JMB had managed to collect ₹ 1.76 crores resulting in shortfall of ₹ 0.91 crore in collection of user fee. In Nongpoh,

[30] In Nongpoh Town Committee, the Dorbar Shnongs of the respective localities are carrying out the collection and transportation of waste from the localities.

[31] Includes garbage collection fees from institutions, shops; penalties, sale of compost, *etc.*

[32] O&M expenditure on SWM activities which includes salaries, wages, fuel, vehicle maintenance, *etc.*

the Town Committee was not involved in the collection and transportation of waste and it was managed by the Dorbar Shnongs of the localities from their own funds.

The other test checked ULBs have not collected the user fees during the period covered by audit resulting in loss of revenue as shown in **Table 4.3**.

Table 4.3: Details of loss of revenue due to non-collection of user fees from households

(₹ in crore)

Name of ULB/Town Committee	Number of households (HH)	Amount of user fees not collected since June 2020 to March 2022
Shillong Municipal Board	34158 HH during 2020-21 & 34655 HH during 2021-22	3.79
Tura Municipal Board	13359 HH during 2021-22	1.47
Total		**5.26**

Source: Information furnished by the test checked ULBs/Town Committee.

It could be seen from the above that the SMB and TMB lost revenue amounting to ₹ 5.26 crore due to non-collection of user fees from households which could have mitigated the operating losses incurred by the ULBs on SWM activities.

During the Exit Conference (May 2023), the Department agreed with the audit observation and stated that the issue of collection of user fees as a standard charge under the Property Tax has been proposed in the Agenda before the Cabinet.

Best Practices

In Sikkim, Gangtok Municipal Corporation (GMC) engaged 22 NGOs (operators) to organise door to door collection of solid waste from households. User fee is collected by the NGOs from the households, part of which is shared with the GMC.

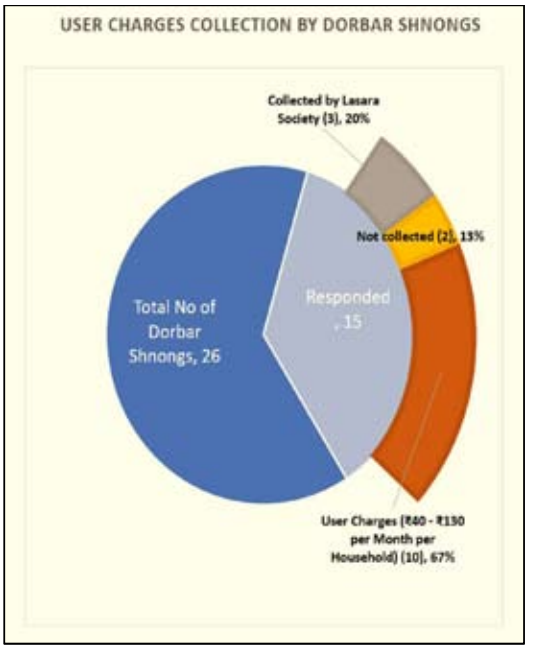
In Meghalaya, the Urban Affairs Department may explore the feasibility of carrying out similar initiatives in the urban areas.

4.4.1 Finances of traditional local bodies (Dorbar Shnongs) in the Census Towns

It has been pointed out in Chapter II that in urban areas not falling under the Municipality or Cantonment Board, Dorbar Shnongs were responsible for SWM activities. Audit carried out a survey of 26 Dorbar Shnongs (localities) under Mawlai and Umpling Census Towns in East Khasi Hills District to ascertain the collection of user charges in census town areas.

Responses received from 15 out of 26 Dorbar Shnongs surveyed revealed that user charges ranging from ₹ 40.00 to ₹ 130.00 per household per month were being collected in ten Dorbar Shnongs. Further, three Dorbar Shnongs had outsourced the waste collection to "Lasara Society" i.e. a Self Help Group, which was collecting household waste on payment basis from the individual households.

Chart 4.5 - Collection of user charges by Dorbar Shnongs



No user charges were collected in the remaining two Dorbar Shnongs.

The survey thus revealed that though there was no institutional presence of the state or municipality in these areas, the traditional bodies and SHGs were playing an important role in municipal waste collection. However, in the absence of a legal framework in the form of bye laws governing the functioning of traditional institutions, the activity of household waste collection was carried out as an informal and unorganised activity. Determination of user charges was ad hoc and unscientific, while collection of user charges by these bodies seemed more as a way to augment the earnings of Dorbar Shnongs/SHGs, rather than as a means to sustain the SWM activity.

There were no records in SMB/Urban Affairs Department to indicate that this Society had been registered as a SHG by SMB/Urban Affairs Department.

Moreover, since the Dorbar Shnongs were not covered under any bye law nor were they recognised as a formal agency involved in household waste collection, no funds could be released to them under the state budget of under CFC grants.

It was interesting to note that although 87 *per cent* of localities under Mawlai and Umpling Census Towns were paying user charges to the Dorbars, SMB and TMB were yet to impose user charges in their jurisdiction up till the audit period.

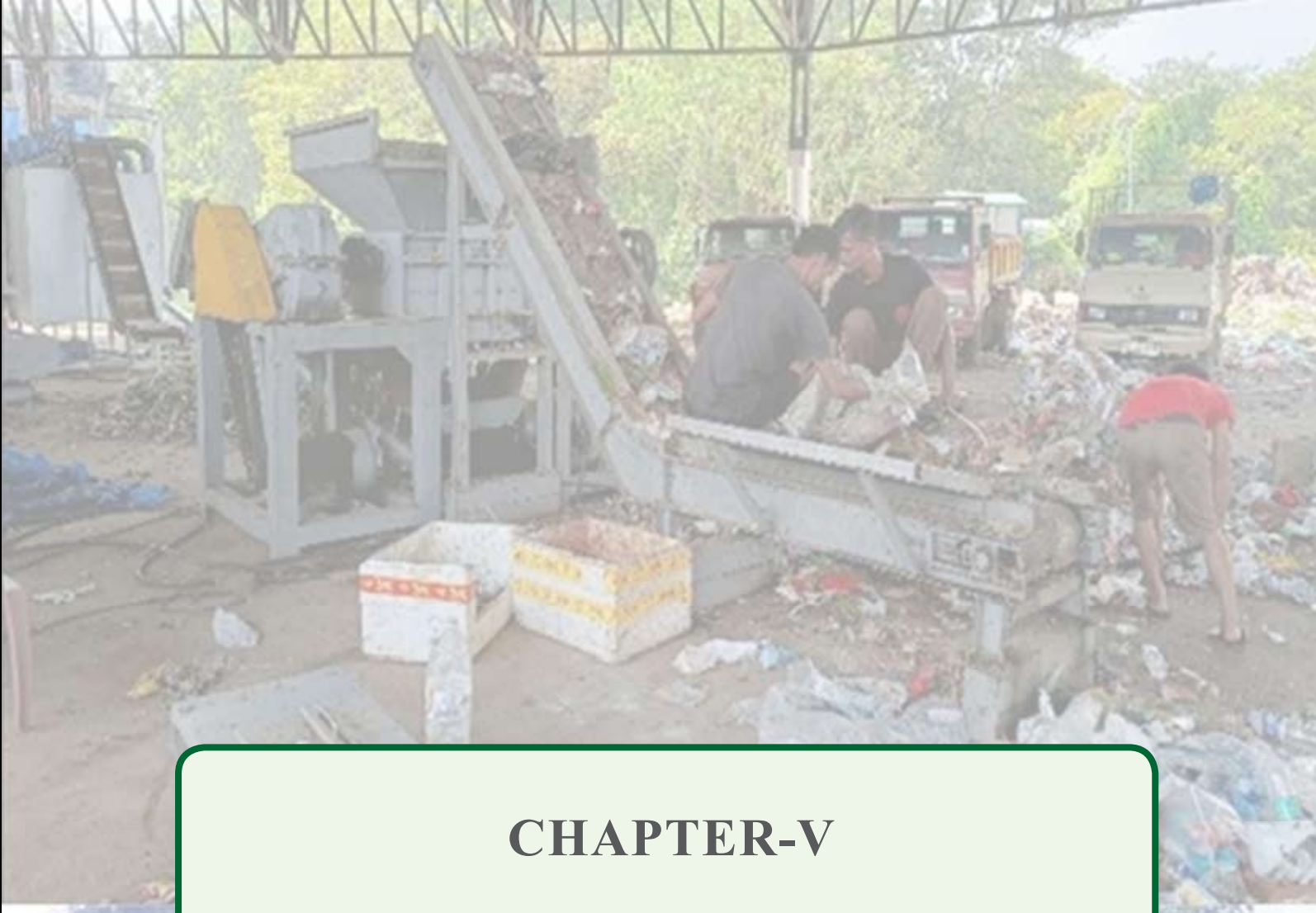
4.5 Conclusion

Analysis of financial resources for the solid waste management in Meghalaya has brought out that over a period of previous five years, bulk of the financial resource has been received under the Asian Development Bank's external funded project of NERCCDIP. However, the NERCCDIP funding agreement being for a period of 10[33] years and for specified activities, this remained a finite source of fund. The Municipal Boards were unable to meet even the operational costs of collection and disposal of municipal waste due to poor collection of user charges. In the absence of any significant budgetary support from the state government, and lack of own funds in the Municipal Boards, the SWM activities in Meghalaya suffer from paucity of funds.

Recommendation:

5. Necessary steps should be taken for augmentation of sustainable financial resources of the Municipal Boards including system of collection of user charges and for strengthening their administrative capacity by recruiting the required manpower and imparting regular training to them to improve efficiency and effectiveness in solid waste collection, transportation and processing.

[33] Tranche 1- Date of loan agreement-04.08.2009, Loan closing date-22.06.2019.
Tranche 2- Date of loan agreement-19.11.2012, Loan closing date-22.06.2019.



CHAPTER-V

SEGREGATION, COLLECTION AND TRANSPORTATION OF WASTE

Chapter-V
Segregation, collection and transportation of waste

NITI Aayog in its Report on Waste-Wise Cities 2021, has cited the example of Indore as the number one city in waste management. One of the success parameters of waste management in Indore was effective and persuasive awareness programme to encourage residents to adopt waste segregation. Once segregation was achieved, the city undertook a study to ascertain the population and the amount of waste generated in each ward, based on which a route plan was developed. Vehicle and staff demand was arrived at to meet the waste collection demand of each ward. Through source segregation, participation of all stakeholders and good governance, Indore has become a champion and number one city in the waste management sector in India.

Audit examined the waste management practices in the urban agglomerations in Meghalaya with respect to the statutory requirements and in comparison to the benchmarks of good practices across the country.

The Audit findings are discussed in this Chapter.

5.1 Segregation

Indiscriminate dumping of solid waste in landfills is not only hazardous for surrounding areas and residential dwellings, it has a far reaching climate impact. Biodegradable waste in landfills releases methane which has a 34 times higher global warming impact over 100 years than carbon dioxide[34].

Segregation of waste at source is key to scientific waste management process. Proper source segregation results in waste minimisation thereby improving the efficiency of processing and treatment of waste which translates into longer life spans of landfills. Rule 4 (a) of the Solid Waste Management Rules, 2016 mandates the segregation of waste into bio-degradable, non-biodegradable and domestic hazardous waste at source. The Meghalaya State Waste Management Strategy and Policy, 2019[35] also mandates segregation of waste into 3 streams:

- Bio-degradable waste
- Non-biodegradable waste
- Domestic hazardous waste

---

[34] Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

[35] Meghalaya State Waste Management Strategy and Policy, 2019 was notified by the Government of Meghalaya on 17 June 2019.

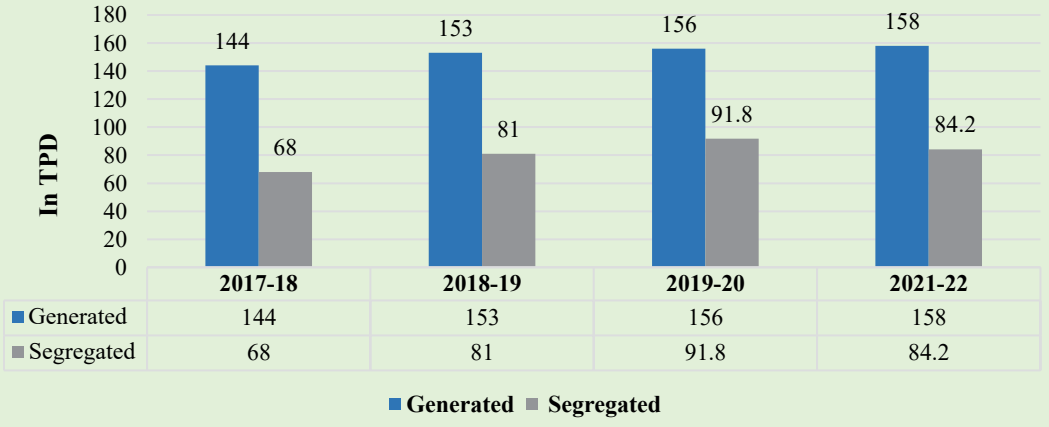
5.1.1 Segregation of waste at source in the urban areas

Insufficient segregation of solid waste at source by households and institutions and no facilities for segregating domestic hazardous waste indicated weak enforcement of SWM Rules in Meghalaya, on one hand, and other hand an absence of effective awareness raising programmed among the households and citizens. Despite distribution of dual-coloured household bins for source segregation of waste, the effectiveness of segregation of waste at source was inadequate. Data available with the department on waste segregation at source was unreliable.

According to the Reports of Meghalaya Pollution Control Board, during the period 2017-18 to 2021-22, the waste collection in urban areas of the state was to the extent of 83 to 89 *per cent*.

As per data available in various agencies, the extent of source segregation of waste in the test checked urban areas was as depicted in **Chart 5.1** and **Chart 5.2**.

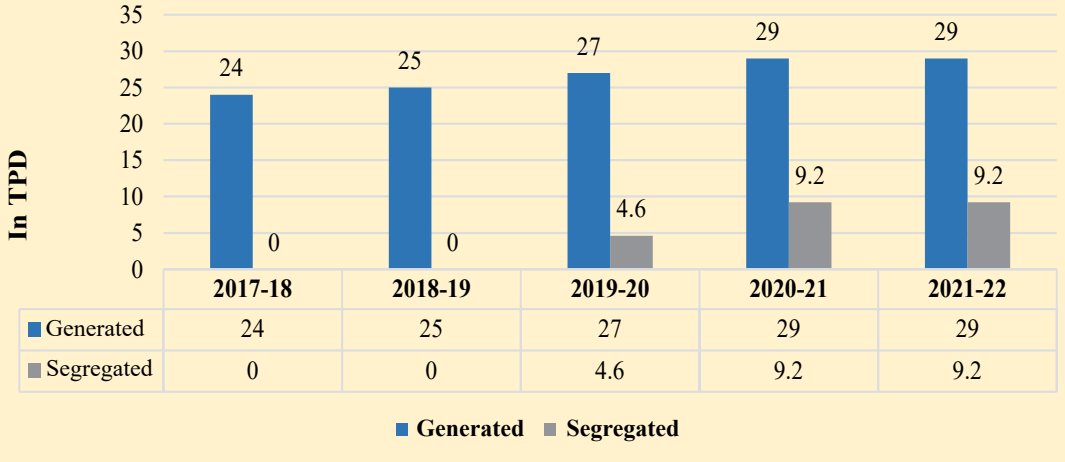
Chart 5.1: Status of source segregation in Shillong Urban Agglomeration



	2017-18	2018-19	2019-20	2021-22
Generated	144	153	156	158
Segregated	68	81	91.8	84.2

Source: Information furnished by SIPMIU.

Chart 5.2: Status of source segregation in Tura



	2017-18	2018-19	2019-20	2020-21	2021-22
Generated	24	25	27	29	29
Segregated	0	0	4.6	9.2	9.2

Source: Information furnished by Tura Municipal Board.

According to municipal records/ SIPMIU records there were 84,571 number of domestic households under Shillong Urban Agglomeration as of 2022. According to the records of Shillong Municipal Board, 80,282 households (95 *per cent*) in Shillong urban agglomeration area were provided with dual coloured[36] household bins free of cost during 2015-16 & 2017-18 under the NERCCDIP project[37]. In Jowai Municipal area, 12,800 dual coloured household bins were purchased for Jowai town under the 14 Finance Commission during 2021-22 for a sum of ₹ 40.96 lakh. From scrutiny of the stock register of Jowai Municipal Board, it was observed that 7,050 of the 12,800 bins purchased had been distributed free of cost to 3,252 out of 5,057 domestic households (70 *per cent*) in Jowai Municipal area. During audit, there were no records to indicate that bins were procured in Tura and Nongpoh.

Table 5.1 Details of expenditure on household bins in the test-checked urban areas

Urban area	No. of households covered	No. of households issued to	Name of scheme	Expenditure incurred
Shillong UA	84,571	80,282	NERCCDIP	₹ 3.58 crores
Jowai	5,057	3,525	14th FC	₹ 0.41 crores

However, as seen from **Charts 5.1** and **Chart 5.2** above, the rate of segregation of waste at source in Shillong and Tura urban areas was between 47-59 *per cent* and 0-32 *per cent*, respectively during 2017-18 to 2020-21. In Jowai town, despite the distribution of 7,050 bins, no segregation was carried out.

Exhibit 5.1: Household bins lying unutilised in the Jowai Municipal Board office premises.

Thus, it was clear that despite the state government's initiative of free distribution of waste bins for segregating waste at source in the domestic households, the actual extent of segregation of municipal waste at source was far from hundred *per cent*.

During the Exit Conference (May 2023), the Department accepted the observation that segregation of waste into recyclable and non-recyclable waste was not being done completely. However, it was stated that in some localities in Shillong, dry and wet waste was collected on different days.

It was thus evident that due to poor segregation of waste in the urban areas, untreated waste was being collected and dumped in the landfills. Poor segregation of waste limited any opportunity for waste recycling and composting of biodegradable waste as economic activities in the value chain.

[36] Green bins for bio-degradable waste and blue bins for non-bio-degradable waste as per Clause 4 (ii) of the Meghalaya Solid Waste Management Bye Law 2020.

[37] North-Eastern Capital Cities Development Investment Programme (an Asian Development Bank funded project).

As far as statistics on waste segregation was concerned, the Department stated these statistics were based on the periodic reports that MSPCB was collecting from different agencies. However, MSPCB stated that they had no mechanism to verify the validity of information submitted. The lack of reliability of data submitted by the ULBs to the MSPCB has been reflected in various parts of this report.

5.1.2 Segregation of domestic hazardous waste and sanitary waste

Absence of notified lists of hazardous waste items, and failure to establish waste deposition centers as required by regulations, and inadequate awareness resulted in non- implementation of source segregation and management of domestic hazardous waste.

Section 2.2.1.1 of the Solid Waste Management Manual, 2016 stipulates that all waste generators practice source segregation of domestic hazardous waste[38]. Domestic hazardous waste is to be segregated in separate bins at the household level. Further, as per Rule 15 (i) of the Solid Waste Management Rules, 2016, it is the responsibility of the ULBs to establish waste deposition centres for domestic hazardous waste and give direction for waste generators to deposit domestic hazardous wastes at this centre for its safe disposal. Also, as per decisions taken in a meeting chaired by the Chief Secretary (24 July 2019), the Deputy Commissioners of all districts, in consultation with the concerned ULBs, were tasked with identifying suitable sites for establishment of deposition centres for domestic hazardous waste for every 20 sq. km area in each of 22 cities/towns in the State, and to initiate process for establishment and operation of such centres at each identified location. Section 2.2.1.1 of the Solid Waste Management Manual, 2016 stipulates that sanitary waste generated from the households must be wrapped up properly and handed over to the waste collectors and should be preferably disposed in biomedical or MSW incinerators, as applicable to the local context or as directed by the State Pollution Control Board.

The extent of non-segregation of domestic municipal waste has already been pointed out in **Para 5.1.1** above. Audit further found that no waste deposition centres for domestic hazardous waste had been established by the municipal authorities in any of the test checked urban areas. As a result, domestic hazardous waste was mixed with municipal solid waste.

[38] Domestic hazardous waste consists of any chemical or product such as 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 that can cause serious illness or pose an environmental threat if improperly disposed or treated.

Exhibit 5.2 Unsegregated sanitary waste at Nongpoh dumping ground (Umshangling)

Exhibit 5.3 Unsegregated domestic waste at Tura (Rongkhon Songittal)

This can be attributed to general lack of awareness of what constitutes domestic hazardous waste as apart from Shillong Municipal Board, the other test checked ULBs have not notified and publicised the list of items classified as domestic hazardous waste to be segregated at source.

Exhibit 5.4: Segregation of waste at Rongkhon Songgital, Tura

Exhibit 5.5: Mixed waste being loaded on to a compactor, Shillong

5.2 Collection of solid municipal waste

An efficient system of waste collection is an essential step in the solid waste management hierarchy. Improper waste collection mechanism adversely affects the aesthetics and public health of towns and cities. Clause 5 of the Meghalaya Solid Waste Management Bye Law, 2020 states that waste collection is the responsibility of the Local Authority *i.e.* Municipality in municipal areas and local traditional institutions in association with District Council with technical support from Agencies of Department of Urban Affairs or any agency authorised outside the municipal area.

Waste collection is categorised into primary and secondary collection. Primary collection pertains to the collection and removal of segregated solid waste from source of its generation including households, shops, offices, markets, *etc*. and taking the waste to a storage depot or transfer station or directly to the disposal site or to a designated sorting/transfer facility. Secondary collection is the collection of waste from community bins, sorting/transfer points to the processing and disposal sites.

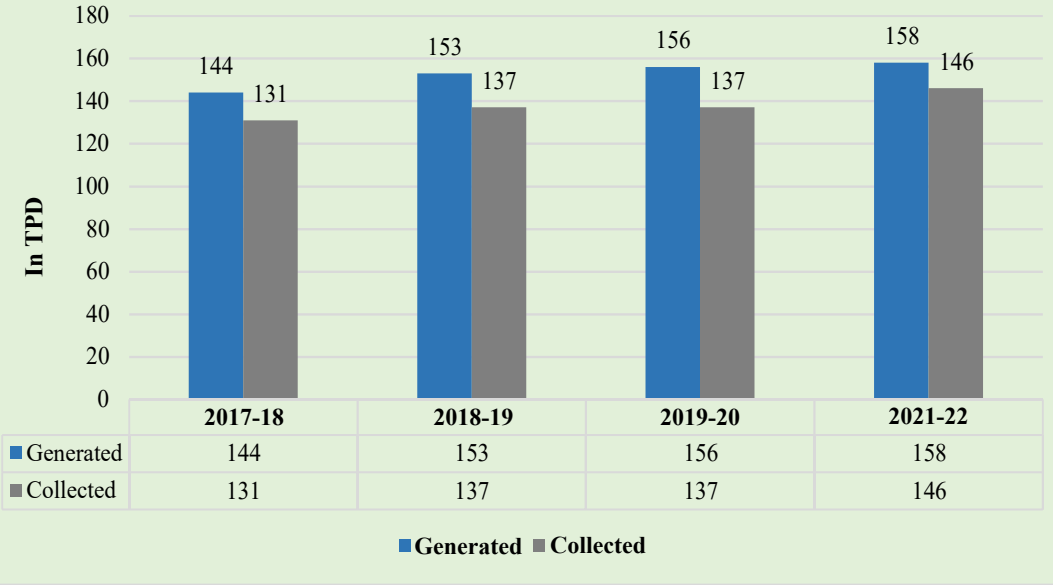
5.2.1 Extent of collection of municipal waste at source

Municipal Boards and Dorbar Shnongs played primary role in collection of municipal waste from households under Municipal areas and most ULBs reported almost hundred percent collection of municipal waste at source, absence of a reliable system for assessment of quantum of waste imposed limitation on the reliability of the data available, including absence of weighbridges methods, including the absence of functioning weighbridges, has led to uncertainties in quantifying the actual amount of waste collected, raising concerns about waste management accuracy and effectiveness.

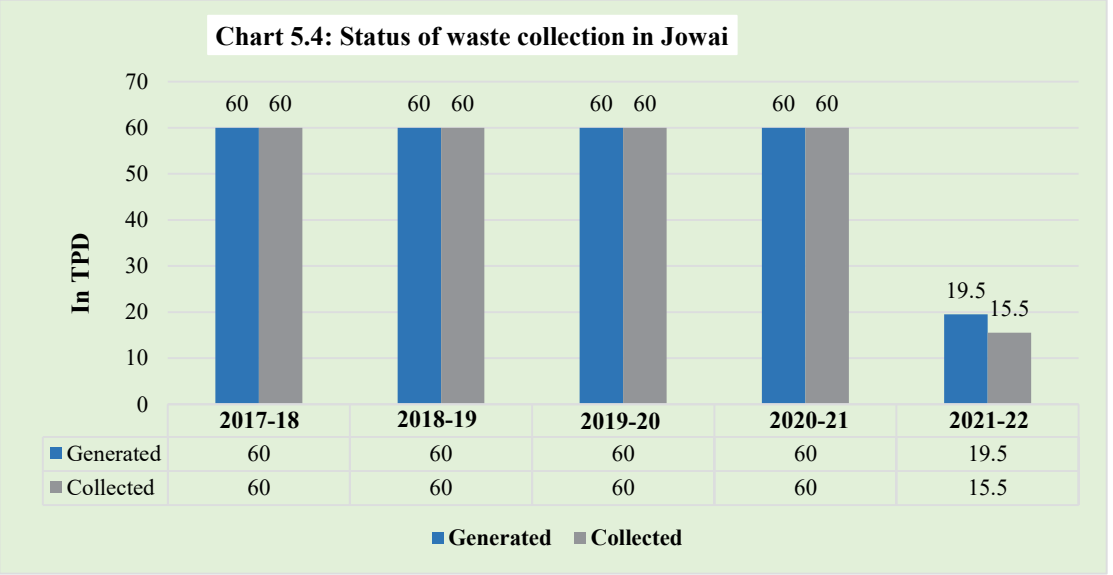
In Meghalaya, the municipal boards and traditional bodies (Dorbar Shnongs) under municipal and town committees/non-municipal areas respectively, were the designated primary agencies involved in the collection and transport of municipal solid waste.

The details of waste collection in relation to the quantum of waste generated in the test checked urban areas for the years 2017-18 to 2021-22 as per information furnished by the ULBs and Town Committee are shown in **Chart 5.3, Chart 5.4** and **Chart 5.5**.

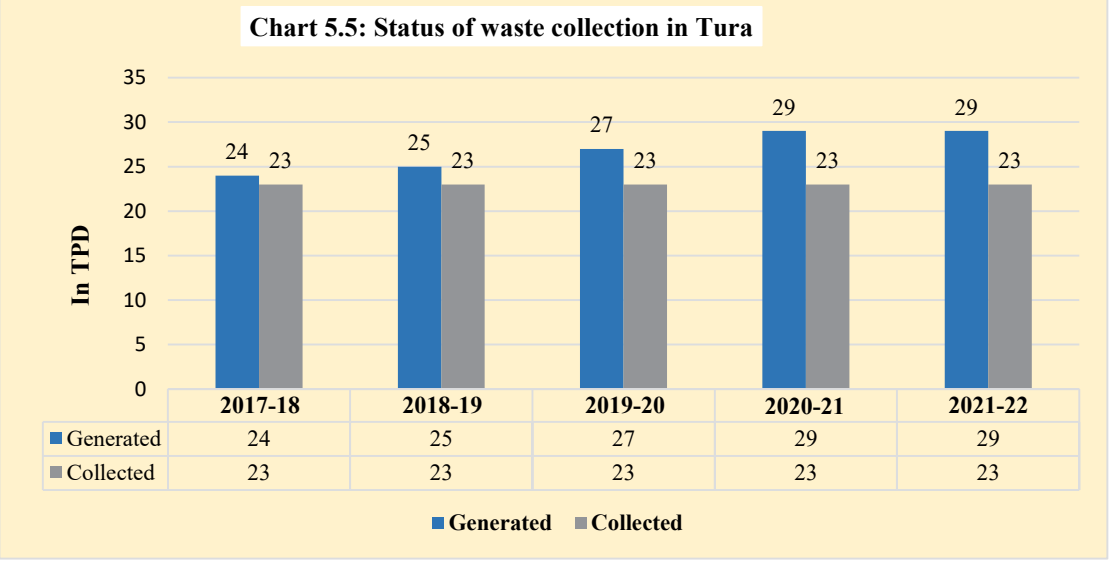
Chart 5.3: Status of waste collection in Shillong Urban Agglomeration



Source: Information furnished by SIPMIU.



Source: Information furnished by Jowai Municipal Board.



Source: Information furnished by Tura Municipal Board.

Data was not available with respect to Nongpoh Town Committee for the year 2017-18 to 2020-21. During 2021-22, four TPD of waste was collected in Nongpoh out of the seven TPD of waste generated.

For Shillong urban agglomeration, the SIPMIU data indicated that on an average 90 *per cent* of municipal waste generated in TPD was being collected by the ULB. Similarly, JMB data showed hundred *per cent* collection of waste that in four out of five years while the collection of waste in Tura was shown as 23 TPD for the period under audit review.

A requirement under Section 4.5.2.10.6 of the Solid Waste Management Manual, 2016 is that there should be a weighbridge in every landfill must have a weighbridge for assessing the quantum of waste collected. Audit observed from JPV of the processing and disposal sites that there were no functioning weighbridges available around landfills

test checked by audit, a fact accepted by the Department during the Exit Meeting. As such, the ULBs and Town Committee had no proper means to quantify the actual amount of waste collected.

Thus, while the statistics of municipal waste collection are encouraging, the reliability of these remain questionable due to weakness of data collection system and absence of any validation mechanism.

5.3 Infrastructure for Collection and Transportation of municipal solid waste.

Lack of source segregation in the tested urban areas resulted in mixed waste being sent to treatment facilities, leading to manual sorting by informal workers during processing and disposal, consequently affecting the quality of processed waste.

Segregation of waste at source cannot be successful unless the institutional mechanisms for collection and transportation of municipal waste is not in place. According to NITI Aayog[39], "Inadequate infrastructure, operational inefficiencies, and poor services for collection and transportation of segregated waste can have a direct bearing on waste segregation behaviour".

Meghalaya Solid Waste Management Bye Laws, 2020, states that non-biodegradable waste, both recyclable and non-recyclable shall be stored and delivered by every generator of waste to the dry waste collection vehicle, which shall be provided by the Local Authority, or any agency appointed by them, twice or thrice a week. Similarly, segregated biodegradable waste shall be stored by generators of such waste within their premises and its delivery shall be ensured by every such generator to the sanitary workers or collection vehicles provided by the Local Authority. Section 2.3.2 of the Solid Waste Management Manual, 2016, stipulates that vehicles used for transportation of waste be covered so that waste is not visible to the public and should have the facility for preventing spillage of waste. As such, it is the responsibility of the designated Local Authority to ensure that the vehicles deployed for collection and transportation are equipped with the prescribed facilities.

Audit found that in the municipal areas under SMB, JMB and TMB, frequency of collection of household waste was daily for localities under SMB, three times a week with alternative days for dry and wet waste in Jowai, while waste was collected daily in Tura.

Further, in survey of 26 localities under traditional local authority, *i.e.* Dorbar Shnongs under Mawlai and Umpling Census Towns, Audit found that out of 15 respondents, three (20 *per cent*) Dorbar Shnongs carried out daily door to door collection; one (7 *per cent*) Dorbar Shnong carried out door to door collection four times a week; five (33 *per cent*) Dorbar Shnongs carried out door to door collection twice a week.

Amongst the remaining six authorities, four Dorbar Shnongs (27 *per cent*) stated that they were collecting waste only once a week while two (13 *per cent*) were not collecting

[39] Policy Guidelines on "Promoting Behaviour Change for strengthening waste segregation at source" issued by NITI Aayog in November 2021.

any waste. In these two Dorbar Shnongs, it was stated that the waste was self-disposed by the households or openly dumped. Thus, there was no uniform practice of waste collection across the different local authorities, resulting in unpredictiveness of waste collection for the residents.

During Audit's Physical Verification of vehicles used for collection and transportation in the few sampled urban areas[40], it was observed that majority of the vehicles deployed for collection of municipal waste had no partition for storing segregated dry and wet household waste. Thus, even if segregated waste was collected from the households, it was mixed up during collection stage in the transportation vehicles due to absence of partitions in the collection vehicles, thereby rendering the source segregation efforts futile. Segregated waste from primary collection vehicles was also mixed while unloading on to the compactors in the transit points. It was also observed that most vehicles were not covered during transportation resulting in foul odour emanating from the uncovered waste.

Exhibit 5.6: Unsegregated waste being transported to dumpsites in a uncovered and un-partitioned vehicle, Jowai

Exhibit 5.7: Waste Collection truck without cover and partition, SUA

During the Exit Conference held in May 2023, the Department accepted the Audit observation regarding mixing of segregated waste during collection and transportation. The Member Secretary, MSPCB agreed that segregated waste collected from the households were mixed in the transportation vehicles. The Director, Urban Affairs Department, however, stated that the segregation of waste by the public was a good step in the right direction which would be fruitful when the Compost Plant/Processing Plants are functioning at full capacity.

Thus, while ULBs and traditional bodies involved in collection of waste carried out the exercise of waste collection from the localities being served by them, absence of a predictable routine coupled with unhygienic conditions of the transport vehicles carrying solid waste indicated that inefficient and insufficient mechanism which could not attract much response from people.

[40] Jaiaw Shyiap, Mission Compound, Lower Mawprem, Nongrim Hills, Laitumkhrah, Rongkhon Songittal, Ladthalaboh West.

5.3.1 Facilities for waste collectors and handlers

Insufficient source segregation and unscientific collection of municipal waste resulted not only in mixed waste being sent to treatment facilities, but also necessitating manual sorting of waste in unhygienic conditions. Personal Protective Equipment kits were not found to be used by the waste handlers thus exposing them to several health hazards.

As stipulated in Rule 15 (zd) of Solid Waste Management Rules, 2016, local bodies shall ensure that the operators of municipal solid waste collection and processing facilities provide personal protection equipment including uniform, fluorescent jacket, hand gloves, raincoats, appropriate footwear, and masks to all workers handling solid waste and the same are used by the workforce.

Audit conducted a Joint Physical Verification (JPV) of waste segregation centres in Shillong and Tura and found that workers were manually sorting waste in the processing and disposal facilities in Shillong[41] and Tura[42]. Due to poorly segregated waste, the quality of processed waste was also adversely affected. During JPVs of selected wards Audit found that majority of the workers involved in collection of waste were not utilising the available safety equipment like boots, gloves and face masks.

Exhibit 5.8: SWM workers handling waste without protective equipment, SMB

Exhibit 5.9: SWM workers handling waste without protective equipment, SMB

Scrutiny of records of JMB revealed that PPE kits such as coat with caps, gumboots, glow jackets, helmet, gloves, masks, *etc*. were procured at a cost of ₹ 3.08 lakhs during 2017-18 to 2021-22 from the Boards' own fund/ Swachh Bharat Mission.

Absence of hygienic waste handling facilities for the workers involved in collection and transportation of waste was a significant gap in the institutional mechanism put in place by the state for ensuring safety of the workers.

[41] A 170 TPD Compost plant at Marten landfill site.
[42] A Refuse Derived Fuel (RDF) plant at Rongkhon Songgital dumpsite.

5.3.2 Monitoring of transportation vehicles through Management Information System

The ULBs and Autonomous District Councils in Meghalaya were ill-equipped to manage and monitor transport vehicles carrying municipal waste from collection points to dumping sites. Absence of Management Information Systems and essential facilities in waste transportation vehicles, along with the lack of GPS and GIS, limited their capacity for identification of garbage vulnerable points and regulated movement of transport vehicles as part of solid waste management services.

In its Report of 2021, the NITI Aayog[43] pointed out that monitoring of waste management practices has been one of the significant challenges in most urban areas. In 2020, to monitor the services and synchronise coordination among different waste management concessionaires, Bruhat Bengaluru Mahanagara Palike (BBMP) employed several Information, Communication, and Technology (ICT) solutions, including an RFID-based attendance system and geotagging of collection routes to monitor the waste management services. In addition, a mobile-based application called Ezetap has been designed to monitor garbage-vulnerable points and impose penalties on offenders.

Even under Solid Waste Management Manual, 2016 (Section 2.3.12.1), guidance has been provided for putting in place an appropriate management information systems (MIS) including deploying geographic information system (GIS), Global Positioning System (GPS), radio frequency identification (RFID) and general packet radio services (GPRS) to manage municipal solid waste. The head of the SWM department as well as the head of the ULB must be informed of the day-to-day performance of the SWM service and daily reports on some aspects of the waste transportation system need to be compiled to take stock of existing performance and take corrective measures.

The fact of municipal waste collection vehicles without partition has already been stated in **Para 5.3**. Audit further sought to examine the mechanism deployed by the local authorities in monitoring and tracking of these vehicles. Scrutiny of information provided by the selected ULBs and Town Committee revealed that none of the vehicles used by the local authorities for collection and transportation of municipal waste were equipped with tracking devices like GPS or RFID. Due to lack of GPS and GIS, the local authorities were not in apposition to accurately track the movement of vehicles, which could have enabled these authorities to efficiently plan and deploy these vehicles.

Exhibit 5.10 Waste transportation trucks, Jowai.

[43] NITI Aayog's Waste-Wise Cities Best Practices in Municipal Solid Waste Management.

Information obtained from SIPMIU revealed that most of the vehicles in SMB and adjoining areas under SUA had been purchased in the year 2015 from the NERCCIPD funds. Subsequently, no budget allocation was made by State Government or ULBs for regular maintenance and upgrade of these vehicles.

Vehicles operating without proper fitness certificates indicated lackadaisical approach of the ULBs towards monitoring minimum working standards of the vehicles deployed by them for waste management services.

During the Exit Conference (May 2023), the Director, Urban Affairs Department stated that the vehicles would be equipped with GPS monitoring systems under Smart City Mission.

Convergence of solid waste management infrastructure under the Smart City Mission for Shillong is a welcome step, and should be taken up in all earnestness by the Government. At the same time, the State Government needs to converge better resources under FC grants, Swachh Bharat Mission scheme and state budgetary resources to modernise and upgrade the infrastructure meant for solid waste segregation, collection and transport in all the urban areas along with the active involvement of the autonomous district councils / traditional bodies.

5.4 Conclusion

Segregation of waste at different levels was either absent or partial in all the test-checked ULBs. Segregation of domestic hazardous waste was not done and sanitary waste was not collected separately. Hence, mixed waste was transported to landfills. Household bins for source segregation were purchased and distributed only in Shillong and Jowai but not in Tura and Nongpoh. Even though bins were distributed in Jowai, source segregation of waste had not yet been carried out.

During joint physical verification, majority of the workers handling waste were not utilising the available safety equipment even though protective gears were procured by the ULBs. The vehicles were not covered during transportation resulting in foul odour emanating from the uncovered waste. None of the available vehicles were equipped with Management Information Systems such as GPS and GIS, due to which tracking of transportation vehicles was not carried out.

Recommendations:

6. ***The State Government should encourage segregation of waste at source by devising a system for incentivising waste generators and collectors for proper segregation of waste and through public awareness campaigns and regular meetings with local traditional bodies, group housing associations, and NGOs.***
7. ***Municipal Boards may consider option of installing community waste bins for collection of waste in a segregated manner apart from providing bins to each household.***
8. ***ULBs should sensitise workers involved in handling waste to ensure compliance to occupational health and safety protocols by wearing safety gear and other protective equipment.***
9. ***The vehicles procured should be suitably designed to collect and transport segregated waste efficiently so as to prevent mixing of segregated waste during various stages of SWM.***

CHAPTER-VI

PROCESSING AND DISPOSAL OF MUNICIPAL SOLID WASTE

JCB

Chapter- VI
Processing and Disposal of Municipal Solid Waste

The Annual Report (2019-20) of Meghalaya State Pollution Control Board indicates that despite the high percentage of municipal waste collection of 83 per cent in urban areas, a significant portion was disposed off in landfills without processing. Judicious processing of municipal waste not only creates value out of waste, but also aids in scientific and non-polluting methods of municipal waste disposal.

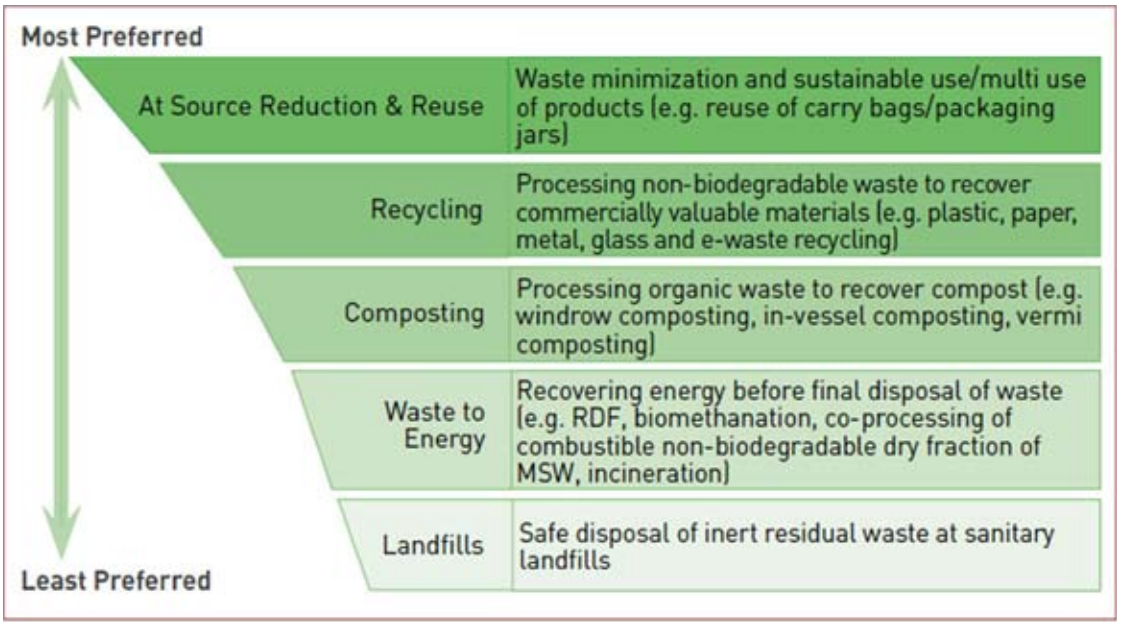
Municipal Solid Waste Management Manual (2016), provides guidance on management of Integrated Solid Waste Management (ISWM), pictorially depicted as follows:

6.1 Status of Waste Processing in Meghalaya

Test check of urban agglomerations revealed that significant portion (70 per cent to 98 per cent) of municipal waste ended up in landfills without any processing.

An ideal mechanism for processing municipal solid waste is depicted below:

Chart 6.1: Integrated Solid Waste Management Hierarchy



Source: Municipal Solid Waste Management Manual 2016.

In the hierarchy of solid waste management, dumping of solid waste in landfills should be of the residual waste remaining after retrieval, reuse, composting and processing of solid waste.

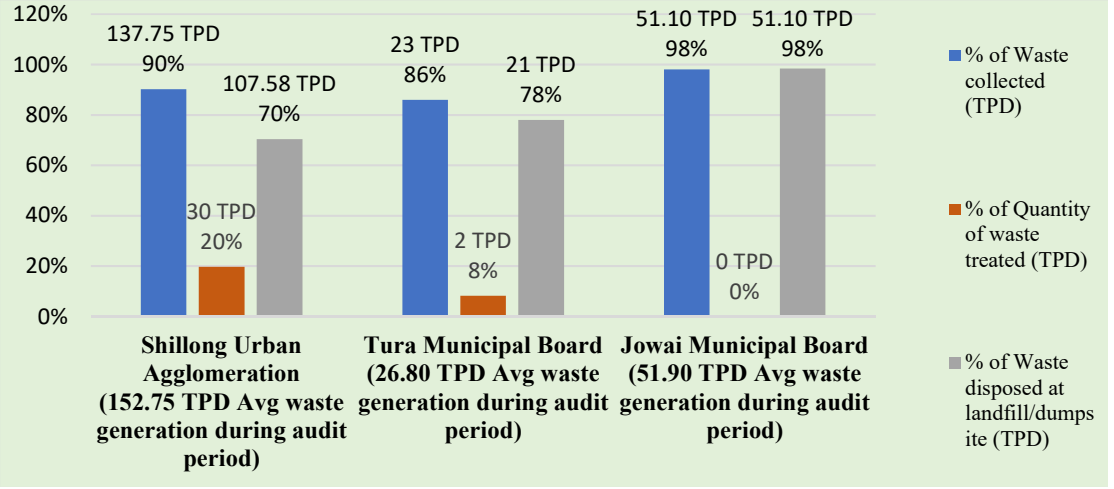
As per MSPCB Annual Report 2019-20, total waste generated in seven[44] urban local bodies was 229.18 TPD[45] out of which 83 *per cent (*191.19 TPD[46]) was collected by

[44] Six Municipal Boards and one Cantonment Board, Shillong (SCB).
[45] SMB-59.85 TPD, SCB-16, JMB-60, TMB-75, WMB- 11.20, RMB-1.03, BMB-6.
[46] SMB-50.96, SCB-16, JMB-56, TMB-50, WMB- 11.20, RMB-1.03, BMB-6.

the ULBs and only 9.64 TPD[47] (four *per cent*) was processed and rest 181.55 TPD (79 *per cent*) was disposed to the landfill.

The status of waste collected and processed in the test-checked urban areas during the period 2017-18 to 2021-22 is given in the Graph below:

Chart 6.2 – Comparison of Waste processing and disposal in selected Urban Areas (Period from 2017-18 to 2021-22)



Source: Information submitted by the SIPMIU[48]/selected ULBs.

From the information available as shown in the Chart above, it can be seen that the waste processing capacity of the major urban areas like Shillong and Tura were grossly insufficient. In Shillong, only 20 *per cent* of the total collected waste, *i.e.* 30 tonnes was being processed, while in Tura the percentage of waste processing was abysmal eight *per cent*. Although the collection of waste from selected urban areas were 90 *per cent* for Shillong Urban Agglomeration, 86 *per cent for* Tura MB and 98 *per cent* for Jowai MB, 70 to 98 *per cent* of unprocessed solid waste ended up in landfills.

No data was being maintained by the Nongpoh Town Committee till 2020-21. During 2021-22, seven TPD waste was generated in Nongpoh but nothing was processed.

Thus, in the hierarchy of Integrated Solid Waste Management laid down in the Municipal Solid Waste Management Manual, Meghalaya was operating at the lowest level of hierarchy or in the least preferred stage.

6.2 Value Chain in Waste Processing

An important component of value chain in solid waste management is recovery of materials that could be used further or recycled. After the initial collection of municipal waste, the first step is to transfer the waste to resource recovery centres, from where the initial segregation of recyclables, organic and inorganic waste and inert could be carried out.

[47] SMB

[48] In Shillong, as per information submitted by SIPMIU; 137.75 TPD of waste was generated of which 30 TPD was processed, 107.58 TPD was disposed in landfill while the remaining 0.17 TPD was unaccounted.

Recyclables like plastic, metal, glass *etc*. have a high potential of material recovery, that can be sold as scrap or used as raw materials if appropriate technology is available.

Organic waste, which forms a bulk of solid municipal waste can be treated further for composting or for energy conversion. The value chain in solid waste management was practically non-existent as composting was unsuccessful due to poor waste segregation practices as pointed out in the succeeding paragraphs.

6.3 Integration of the informal sector in recycling process

Despite the presence of recycling initiatives in certain urban areas, such as Shillong and Tura, the proper functioning and integration of waste recovery centers and recyclers into the solid waste management system, as required by SWM Rules, 2016, have been lacking, leading to suboptimal recycling efforts.

Section 3.1 of MSWM Manual 2016 defines recycling as "the process of transforming segregated solid waste into a new product or a raw material for producing new products." Further, it also states that "arrangement shall be made to provide segregated recyclable material to the recycling industry through waste pickers or any other agency engaged or authorised by the urban local body for the purpose". **Chart 6.1** indicates the importance of recycling in the ISWM hierarchy.

Audit carried out a survey of 26 Dorbar Shnongs (localities) under Mawlai and Umpling Census Towns (East Khasi Hills) to ascertain the recycling and composting activities in census town areas, of which 15 responded. Out of 15 respondents of the survey of Dorbar Shnongs, 14 (93 *per cent*) stated that no recycling or composting activities were undertaken in the localities.

During Joint Physical Verification (JPV) of the test checked Urban Areas, audit noticed the following:

- A Waste Recovery Centre (WRC) Shillong, to reduce waste transportation cost by recovering recyclable waste to be sold as scrap, was set up at Umpling, a census town within SUA, which was being operated by two people (unregistered as SHG till the date of JPV). The WRC was set up with space for composting and storing of waste. During JPV (September 2022), it was however seen that all the sheds to segregate and store valuable materials from the waste were empty except glass bottle shed. The person in-charge admitted that the WRC was not yet fully functional and there were no earnings from the WRC. It was also stated that due to improper segregation, the entire waste goes to landfill. The SMB in collaboration with the Dorbar Shnong of Umpling should take steps to fully operationalise this WRC in order to reduce the waste generated from the locality which will ultimately reduce the burden in the sanitary landfill at Marten.

Exhibit 6.1: Storage shed used not as intended

Exhibit 6.2: Glass bottle storage

- Eleven recyclers were operating in Marten landfill site to collect, sort and transport various types of recyclable materials segregated from the collected waste. However, there were no records to indicate that these recyclers have been formally integrated into the SWM system.

Exhibit 6.3: Recyclers operating at Marten, Shillong

Exhibit 6.4: Manual workers sorting recyclables from dumped waste

- In Tura, some workers were seen segregating/sorting the recyclables, valuable materials from the heap of garbage and transferring them to recycling industries. These workers were part of Swapan Industries and they are recycling about one TPD of waste from Rongkhon Songittal, the dumping site of Tura. The proprietor informed that his transporting capacity could be augmented if one plastic baling machine was made available to him.

Exhibit 6.5 & 6.6: Informal Sector workers sorting and packaging recyclables at Tura dumpsite

There is a vertical composting unit available at the Waste Recovery Centre (WRC), Umpling. However, plastic waste was seen mixed with the vertical composting which may degrade the quality of compost. There was no earning as on the date of audit from the sale of compost.

Thus, within the test checked urban areas, there were very limited mechanisms in place, including involvement of informal sector, for waste recovery for transferring them to recycling industry, observed only in Tura and Shillong.

6.4 Status of Composting

According to Section 3.2 of MSWM Manual, composting is a process of controlled decomposition of the organic waste, typically in aerobic conditions, resulting in the production of stable humus-like product, *i.e.*, compost. Composting improves soil quality, enhances water retention capacity of soil, increases biological activity, micronutrient content, and improves pest resistance of crops. It also minimises greenhouse gases emissions from anaerobic decomposition of organic waste and increases the design life of other waste management facilities.

As per Section 3.2.4 of MSWM Manual 2016, market development for compost and proper quality monitoring are crucial. The pricing mechanism for sale of compost should be assessed by fixing a minimum retail price for compost, which meets Fertiliser Control Order (FCO) 2009 standards. All state and local government departments should be encouraged to promote the use of compost in parks, gardens, nurseries, and urban forestry projects. The benefits of compost should be informed to farmers, who should be encouraged to partially substitute inorganic fertilisers with organic compost, as appropriate for their crop and specific soil. In addition, opportunities for involving agricultural officers to generate awareness of compost usage among farmers should be looked into.

In Meghalaya, sanction had been accorded through schemes like JnNURM (March 2009) and NERCCDIP (May 2019) for setting up of composting plants in Nongpoh, Tura and Shillong. The status of these composting plants is discussed in succeeding paragraphs.

6.4.1 Compost plant in Nongpoh

The Nongpoh solid waste management project, sanctioned under JnNURM, faced delays and remained incomplete, with the composting facility and associated structures left unused and non-functional, despite payments for civil works and machinery which led to wasteful expenditure of ₹ 4.48 crore.

SWM project for Nongpoh town was sanctioned (March 2009) at a cost of ₹ 600.16 lakh under UIDSSMT[49] of JnNURM. Mention was made in Paragraph 1.6 of the Report of the Comptroller and Auditor General of India on Social, Economic, General and Economic (PSUs) Sectors for the year ended 31 March 2015 regarding delay in executing the civil

[49] Urban Infrastructure Development Scheme for Small & Medium Towns.

and compost plant works in Nongpoh leading to the project remaining incomplete. Two major components of this project were 'Civil works for Compost Plant site including windrow platform, vermi pits, office building for main structure, site development for plant and installation of '25 TPD Compost Plant'. The work was allotted to M/s Marbaniang Enterprises. Total expenditure incurred towards civil works as per final Running Account (RA) bills for civil works was ₹ 3.63 crore whereas the expenditure incurred towards the compost plant was ₹ 0.82 crore.

During Joint Physical Verification (JPV) of SWM facilities in Nongpoh (17 November 2022), the following were revealed:

- This facility was yet to be handed over to the Town Committee by MUDA.
- Though the composting plant and windrow platform was available at the site, no composting was being carried out.
- Facilities including the machineries, the windrow platforms, vermi-compost pits, office building, storage rooms, *etc.* was not used as they were originally intended.
- Machineries at Nongpoh could not be started and vegetation could be seen growing out of the machinery. The windrow platform, vermi-compost pits and office building, *etc*. were lying idle and unused since completion.

Exhibit 6.7: Compost Plant Machineries with vegetation coming up at Nongpoh

Exhibit 6.8: Unused windrow platform at Nongpoh

Exhibit 6.9: Damaged panel board of compost plant

Exhibit 6.10: Parts of the machineries lying separately

In reply to audit (January 2023), the Secretary, MUDA stated that the handing over of the facility was deferred due to the pandemic. It was further stated that present waste characteristics of the solid waste generated and collected in Nongpoh comprises mainly of biodegradable and recyclable waste and only a small fraction of inert waste is generated and collected. Hence, absence of sanitary landfill will not hamper operation of the solid waste management in Nongpoh.

Audit noted that the final bill for construction of the civil works for Compost Plant site was paid in March 2017, which was three years prior to the pandemic.

Further, according to the Detailed Project Report (DPR), 52 *per cent* of waste generated in Nongpoh town area was bio-degradable, 24 *per cent* was inert and rest was recyclable. Hence, the statement made by the Secretary that only a small fraction of inert waste is generated and collected was inconsistent with the DPR.

As evident from the photographs taken on site, civil structures for segregation, treatment and storage of waste as well as the compost plants were not used.

Exhibit 6.11: Unused vermi compost pits at Nongpoh

Exhibit 6.12: Unused office room

Thus, this resulted in wasteful expenditure on civil works for Compost Plant site and Compost Plant machineries. Further, absence of waste composting facility exacerbated the risk of dumping untreated waste in landfills.

6.4.2 Compost Plant in Tura

Tura solid waste management project sanctioned under JnNURM, including a compost plant, faced delays and remained incomplete, with the composting facilities and associated structures left unused and the machinery not utilised as intended, despite payments for civil works and commissioning which led to wasteful expenditure of ₹ 5.16 crore.

SWM project for Tura town was sanctioned (March 2009) at a cost of ₹ 833.10 lakh under UIDSSMT[50] of JnNURM. Mention was made in Paragraph 1.6 of the Report of the Comptroller and Auditor General of India on Social, Economic, General and Economic

[50] Urban Infrastructure Development Scheme for Small & Medium Towns.

(PSUs) Sectors for the year ended 31 March 2015 regarding delay in executing the civil and compost plant works in Tura leading to the project remaining incomplete. Two major components of this project were 'Civil works for Compost Plant site including covered window platform, tromel shed, ramp, office, retaining walls, site development for plant, finished and semi-finished store *etc.*' and installation of 'Compost Plant'. The work was executed by Shri R.P. Marak and Smti S.Ch. Momin. The total expenditure incurred towards civil works as per final Running Account (RA) bills for civil works was ₹ 3.98 crore[51].

A Compost Plant of 50 TPD was commissioned during February 2015. It was also noticed that an amount of ₹ 1.08 crore was incurred towards the Compost Plant.

During JPV (November 2022) of SWM facilities in Tura, the following were revealed:

- The facilities were handed over to TMB by the Executive Engineer, Urban Affairs, Tura (July 2019).
- A composting plant was also available at the site but it was observed that no composting was being carried out. Officials from the TMB apprised that the machinery was never used for its intended purpose.
- The road around the plant, drain around the road, leachate drain was not observed. Officials from the TMB apprised that those could not be seen as they were already under the dumped garbage.
- The vermi composting platform was learned to be dismantled and now being used to dump garbage and no traces of the same was visible.

Exhibit 6.13: Unused Compost Plant Machineries

Exhibit 6.14: Dumping of waste near Compost Plant

Hence, it is evident that the civil structures for segregation, treatment and storage of waste as well as the compost plant machinery was not used as intended. This resulted in wasteful expenditure of ₹ 5.16 crore towards civil works for Compost Plant site and Compost Plant machineries leading to the risk of dumping untreated waste in landfills.

During the Exit Conference (May 2023), the Director, Urban Affairs Department stated that the Department would take steps to hand hold the Municipal Board to ensure that the Compost Plants become functional.

[51] RP Marak (₹ 3.53 crore) + S. Ch Momin (₹ 0.45 crore).

6.4.3 Compost plant in Shillong

The compost plant installed at Marten landfill site in Shillong was handed over to the Shillong Municipal Board but experienced underutilisation due to challenges in source segregation, lack of marketing efforts, and issues with compost quality, resulting in a production far below its capacity.

The revised estimate for supply and installation of 170 TPD compost plant costing ₹ 16.32 crore was sanctioned (May 2019) under NERCCDIP which was to be installed in Marten, the sanitary landfill site of Shillong Municipal Board. The compost plant started functioning since March 2022. The Compost plant had been proposed as the only alternative for the safe treatment of segregated organic waste generated in Shillong Urban Agglomeration area. In the DPR, it was stated that the compost produced from mixed waste had very less acceptability and it was a herculean task to market the compost and due to this, it was proposed that only segregated biodegradable waste be treated in the composting plant to obtain the desired quality of the compost.

During JPV (September 2022), it was seen that the compost plant was functioning but was not utilised at full capacity due to poor source segregation of waste. This was apparent from the fact that even though the compost plant started functioning since March 2022, presently, SMB processed only 30 TPD of segregated waste collected against the capacity of 170 TPD during the year 2022. Audit noticed that the reasons for under performance was as under:

- The SMB could not ensure proper source segregation and transportation of segregated wastes to the composting units without getting mixed.
- Till now no steps were taken by the SMB to market the compost through publicity or by any other means.

Due to the above reasons, the SMB was unable to maximise the benefits of the compost plant due to which the quantum of processed waste in Shillong still remained low at 17 *per cent* [52] during 2022.

Exhibit 6.15: Mixed waste put into first input section of the compost plant

Exhibit 6.16: Output from the first section not properly segregated

During the Exit Conference (May 2023), the Department admitted that the compost plant at Shillong was not functioning at its full capacity. Further, on being asked whether compost being produced is of commercial grade and being sold in the market,

[52] 30 TPD compost out of 178 TPD generated.

it was stated that the sample of the compost was sent for testing but test report was still unsatisfactory. Therefore, the compost being produced is unmarketable currently.

6.5 Dumping of Municipal Waste

Discussion in the preceding paragraphs has revealed that most of the municipal waste in the urban areas in Meghalaya is being dumped in landfills in the absence of adequate and appropriate waste processing facilities.

Audit examined the condition of landfills falling under the jurisdiction of sampled municipal boards and observed the following:

6.5.1 Identification and acquisition of suitable land for sanitary landfill and other waste management facilities.

Solid Waste Management Rules mandated the identification and allocation of suitable land for waste processing, but despite the reconstitution of a Task Force Committee and recommendations for certain areas, the acquisition process for the required land in multiple urban areas including Shillong, Tura, and Jowai was still pending as of May 2023.

Rule 15(zh) of the SWM Rules, 2016 states that it is the duty of the local authorities to stop land filling or dumping of mixed waste and to set up and operationalise the sanitary landfill as per the timeline specified in Rule 22. The extract of timelines is given in **Table 6.1.**

Table 6.1: Timeline to identify suitable sites and setting up solid waste processing facility and sanitary landfill facilities.

Sl. No.	Activity	Time limit from the date of notification of rules (8 April 2016)
1.	Identification of suitable sites for setting up solid waste processing facilities.	1 year
2.	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or standalone sanitary landfill facilities by all local authorities having a population of 0.5 million or more.	1 year
3.	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities.	2 years

Source: Rule 22 of SWM Rules, 2016.

A Task Force Committee was constituted by the Urban Affairs Department on 11 March 2011 to identify a suitable location for a landfill site in all the districts which would meet the future requirement. The Committee was reconstituted on 13 February 2016 and 21 May 2018. The Committee comprised of the Director, Urban Affairs as Chairman and District Urban Planner of the concerned Districts as Member Secretary. During

April 2022, the Committee was again reconstituted with the Deputy Commissioner and the District Urban Planner of the concerned Districts as the Chairman and Member Secretary respectively. However, till date (May 2023), none of the four test checked Urban Areas were able to acquire suitable land as stipulated under Clause 4.5.2.1 of MSWM Manual 2016 which is detailed in the succeeding para.

As per Rule 11 (f) of the Solid Waste Management (SWM) Rules 2016, it was the duty of Secretary-in-charge, Urban Development in the States to ensure identification and allocation of suitable land to the local bodies within one year for setting up of processing and disposal facilities for solid waste and incorporate them in the master plans (land use plan) of the State or as the case may be, cities through metropolitan and district planning committees or town and country planning department.

In this regard, the Director, Urban Affairs Department stated (March 2023) that the Task Force Committee had recommended the sites for Shillong, Tura and Jowai and the acquisition process has been initiated for Tura but acquisition process for Shillong and Jowai was still awaited.

6.5.2 Availability and Landfill Capacity of the Waste Disposal Sites

Despite the establishment of Task Force Committees and the stipulation under Solid Waste Management Rules, none of the four tested urban areas have successfully acquired suitable land for processing and disposal facilities for solid waste, with only Tura having initiated the acquisition process among the three identified areas.

Mention was made in Paragraph 1.1.13.4 of the Report of the Comptroller and Auditor General of India on Social, Economic, General and Economic (PSUs) Sectors for the year ended 31 March 2011 regarding lack of scientific landfills in all the six municipal boards of the State resulting in open dumping of mixed waste which could lead to environmental pollution. The condition of the old and prevailing dumpsites and sanitary landfill (as on the date of JPVs) in the test checked Urban Areas are detailed in **Table 6.2**.

Table 6.2: Status of old dumpsites of test checked ULBs

Sl. No.	Name	Used by Locality	Category	Total Area of the existing disposal facility (in acre)	Current Condition
1	Marten	Shillong Urban Agglomeration	Converted to Sanitary Landfill	11.63 acres[53]	In use
2	Mynkjai	Jowai Town	Dumpsite	2.22 acres[54]	Closed
3	Ronkhon Songgital	Tura Town	Dumpsite	3.99 acres[55]	In use
4	Umshangling	Nongpoh Town	Dumpsite	1.50 acres	In use

Source: Information furnished by test checked ULBs.

[53] 4.706 hectares.
[54] 0.9 HA.
[55] 16187.24 sqm.

As per Clause 4.5.2.1 of MSWM Manual 2016 the Design Life for a Sanitary Landfill should be 20 to 25 years[56] and as per Clause 4.5.1.3 of MSWM manual the required area of the landfill site for the selected urban areas[57] should be 15 – 20 hectares (Section 4.5.2.1 of MSWM Manual). In this period, as per data submitted by Shillong, Jowai and Tura Municipal board and Nongpoh Town Committee, the estimated waste generation of these ULBs for 20 to 25 years is detailed in **Table 6.3** (considering five *per cent* annual increase in waste generation as per Section 1.4.3.3 of MSWM Manual 2016).

Table 6.3: Projection of Waste Generation for the next 20-25 years and area required for development of sanitary landfill and related infrastructure.

Sl. No.	Locality	Avg Waste Generation (TPD) from 2017-18 to 2021-22 (A)	Yearly waste generation (Ton) (B) = (A) * 365	Cumulative waste generation in 20-25 years (in lakh tonnes) (C)[58]	Area (in acre) required[59]	Total Area of the existing disposal facility (in acre)	Percentage area of available land in comparison with actual requirement
1	Shillong Urban Agglome-ration	152.75	55754	1.48 - 1.89	37.01-49.42	11.63 acres	24 – 31 %
2	Jowai	51.9	18943.5	0.50 - 0.64	37.01-49.42	Nil[60]	-
3	Tura	26.8	9782	0.26 - 0.33	37.01-49.42	3.99 acres	8 – 11 %
4	Nongpoh	7	2555	0.07 - 0.09	37.01-49.42	1.5 acres	3 – 4 %

Hence, it is evident from the table above that, none of the test checked Urban Areas has enough space (not even 50 *per cent*) to carry out scientific SWM through setting up sanitary landfill and other required processing plants/infrastructure for the next 20-25 years.

Director, Urban Affairs Department stated (March 2023) that the Task Force Committee set up to identify landfill sites had recommended the sites for Shillong, Tura and Jowai and the acquisition process has been initiated for Tura but acquisition process for Shillong and Jowai was still awaited.

Thus, the State of Meghalaya is facing a precarious situation of non-availability of suitable land for scientific disposal and mining of municipal waste with an enhanced risk to public health and environment.

[56] only the active period excluding closure & post closure period.

[57] In all the selected areas, the quantity of waste generated would be less than 10 lakh ton during the period of Design Life.

[58] C (lakh tonnes) = [B x (1.05) ^ Number of years] / 100000.

[59] As per Clause 4.5.1.3 required sanitary landfill area including the related infrastructure is 15-20 HA (37.01 - 49.42 acres) for less than 10 lakh tonnes waste generation throughput design life of the sanitary landfill (only considering the active period excluding closure & post closure period).

[60] Mynkjai dumping site was closed since November 2021.

Case Study 1– Shillong Landfill Facility

The Shillong Landfill Facility (SLF) established under NERCCDIP in two phases has seen a shorter-than-anticipated operational lifespan due to poor waste processing efficiency, with Phase I fully utilised and Phase II rapidly filling, prompting the need for increased waste processing efficiency to extend the facility's use beyond the estimated eight years.

November 2017 image of Marten Landfill extracted from the Google Earth showing fully unutilized Phase-I of the SLF

December 2019 image of Marten Landfill extracted from the Google Earth showing Phase-I of SLF was half utilised

Phase I of SLF was completed in May 2017 while Phase II was completed in February 2021. As per the DPR, the proposed design life of the landfill was 15 years *i.e.*, up to 2029. This SLF was being used by Shillong Municipal Board (SMB) and the Dorbar Shnongs under the Census Towns.

Satellite imagery showed that Phase I of the SLF was already fully utilised and was covered under vegetation. Major portion of the Phase II SLF was already filled with waste. During Joint Physical Verification with the audit team, officials from the Shillong Municipal Board confirmed that the space (Phase II) would last only for three more years up to 2025.

Considering that the dumping of waste in Phase I started during October- November 2017 and would last up to 2025, it indicates that the SLF can now be used for eight years only, instead of the design life of 15 years.

November 2020 image of Marten Landfill extracted from the Google Earth showing the Phase-I area almost utilized fully but Phase-II area was yet to be started utilization (black portion)

April 2021 image of Marten Landfill extracted from the Google Earth showing Phase-I of SLF was fully utilised

September 2022 drone image of Marten Landfill showing the Phase-II of the SLF is already half utilised

Portion of unutilized landfill at Marten Shillong (September 2022)

During the Exit Conference (May 2023), the Department agreed to the audit findings. The Director, Urban Affairs Department stated that Request for proposal (RFP) was floated to process the legacy waste in Marten which will free up more space.

Case Study 2- Disposal of solid waste in Jowai

Since inception of JMB (November 1995) the municipal waste collected was being dumped at JHADC's old dump site situated at Mynkjai[61]. After receipt of a complaint (September 2015) from 12-Dorbar Shnong Joint Action Committee (JAC), West Jaintia Hills District, JHADC closed the old dumpsite (November 2015). Subsequently, a new dump site was identified on the other side of Mynkjai. An agreement was also entered between JMB and JHADC (August 2017) for disposal of waste at the new dumpsite until a sanitary landfill was established.

Protests emerged during March 2021 against the unhygienic dumping of waste at the new dump site at Mynkjai by the local villages[62] and students, in response to which the district administration agreed to use this site as an interim arrangement for three months *w.e.f* 14 August 2021.

Exhibit 6.17: Traces of Haphazard dumping of waste at Mynkjai dumping ground (October 2022)

Exhibit 6.18: Traces of Unsegregated waste at Mynkjai dumping ground (October 2022)

[61] Mynkjai is a site used for dumping by JHADC.

[62] Pynthor, Langtein, Umsalang, Shken Pyrsit, Mupyut, Madan Tyrpait, Moosakhia and Sohmynting.

In this interim period of three months, the JMB identified a plot of land of 136.60 acre at Mookabeng Village belonging to one Smt. Baiamonlang Shylla as temporary dumping site.

Exhibit 6.19: Mixing of non-biodegradable (plastics) with biodegradable waste in temporary dumping of waste at Mookabeng

On 8 November 2021, Deputy Commissioner, West Jainitia Hills gave an order to JMB to start disposing its waste at the temporary dumping ground at Mookabeng village immediately and to sign an agreement with the landowner *i.e.* Smt. Baiamonlang Shylla for the same. After signing the agreement 09 November 2021, the JMB started dumping wastes from 15 November 2021. It was observed from the proceedings of the meeting held (21 December 2021) between JMB and the local community members that the latter raised the objections on the temporary dumping site due to fear that the unscientific dumping of waste will lead to problems of air and water pollution and affect the nearby Umngi river, paddy fields, water sources and general health. The Elaka Nartiang Coordinate Committee (ENCC) also mentioned that the haphazard disposal of waste into shallow burial pits without establishing a sanitary landfill and scientific plants would definitely impact the land and village. The protest of the community members resulted in law-and-order problem in the area whereby Section 144 of Cr.P.C was imposed on 23 December 2021. Subsequently, on 3 January 2022, the four villages[63] and ENCC agreed to revoke their opposition and allowed to dump waste until 5 February 2022 provided the Government show sign of constructions for improvement of the site. An awareness programme was also conducted in the four villages on 31 January 2022 and 3 February 2022. However, action taken in this regard, if any, by the Deputy Commissioner or by JMB was not available on records. Subsequently, a Public Hearing was conducted on 04 March 2022. It was noticed from the minutes that though the Waheh Shnongs[64] of the aforementioned four villages had no objection with the project, however, majority of the general public present in the hearing opposed it.

Concurrently, the local administration in West Jainita Hills submitted a proposal for acquiring land at a lumpsum rate of ₹ 5.65 crore to be used as a permanent landfill site to the State Government, which was not approved till date.

After the opposition over the dumping of waste in Mookabeng village by the ENCC, the JMB were able to dump their waste in Mookabeng only up to 5 February 2022. Thus, JMB was unable to dispose the loaded garbage and waste from Market areas as well as from households started accumulating in the town area for almost two months which led

[63] Larnai, Sohphoh, Thadmusem & Nongkroh.

[64] Waheh Shnongs denote locality/village headmen of villages under Jaintia Hills.

to a huge uproar by the residents/NGOs as well as negative media feedback on the issue. In view of the sensitive situation, the JMB resorted to dumping of waste in private land by using private dumpers.

Scrutiny of records made available to audit revealed that the JMB had already incurred an expenditure of ₹ 33.36 lakh (₹ 19.58 lakh which has already been paid (**Appendix III)** and pending bills as of 11 May 2022 amounting to ₹ 13.78 lakh for dumping of waste in private lands during the period from January 2022 up to August 2022. The Chairman, JMB also forwarded (August 2022) a proposal to the Minister-in-charge, Urban Affairs Department seeking additional funding of ₹ 60.80 lakh which will be used for dumping of waste from August 2022 to March 2023.

Exhibit 6.20: Temporary dumping site at Mukhla where waste was filled with loose soil

The case study of open and unscientific dumping of municipal waste in Jowai and adjoining areas under the Jowai Municipal Board and Jaintia Hills Autonomous District Council reveal the stark reality of absence of any mechanism of solid waste management in the urban agglomerates of West Jainitia Hills. The *ad hoc* measures taken by different government agencies for disposal of municipal waste, and failure of the government to identify a suitable landfill site have resulted in an unsustainable situation of waste disposal.

During the Exit Conference (May 2023), the Department stated that the municipal waste was currently being dumped at an undisclosed site. The department informed that a landfill site had been identified in Jowai, and an Environmental Impact Assessment (EIA) for identified landfill site at Jowai is underway.

Case Study 3 - Disposal of solid waste in Tura

Tura Municipal Board was constituted in 1979 and a small plot of land measuring only about 3.99 acres at Rongkhon Songittal was acquired for use as dumping site. At the time of acquisition, the site was uninhabited. As time passed, the surrounding of the dumpsite was occupied by residential buildings, graveyard, roads and public amenities. Continuous dumping resulted in spillage of garbage outside the compound which affected a public graveyard situated very near to the dumpsite. The Secretary of the Rongkhon Songittal[65] filed a case against indiscriminate dumping in and around the dumpsite causing encroachment of the graveyard, burning of garbage and violation of SWM Rules 2016. The Meghalaya High Court (December 2018) directed TMB not to use the graveyard as a dumpsite and clean the garbage from the graveyard. During June 2019, the TMB had to dismantle one of its assets vermi-composting pits to make space for dumping of waste.

[65] Secretary of the village traditional local body.

Exhibit 6.21: Haphazard dumping of waste at Tura

Exhibit 6.22: Spillage of waste at Tura

During the Exit Conference (May 2023), the Department stated that partial payment has recently been made for procurement of 30 acres of additional land for landfill.

Case Study 4- Disposal of municipal waste in Nongpoh

In **Nongpoh,** the waste is disposed at Umshangling dumpsite. During JPV, it was seen that mixed waste was openly dumped in a gorge in the dumpsite. It was also noticed that the waste was being burnt to which the officials from Nongpoh Town Committee stated that waste was burned by miscreants oftentimes as the dumpsite was neither fenced nor gated.

Exhibit 6.23: Traces of burning of wastes at Nongpoh

Exhibit 6.24 & 6.25: Unscientific dumping of unsegregated waste into a gorge at Nongpoh

During the Exit Conference (May 2023), the Director, Urban Affairs Department agreed that the Compost Plant must be made functional. He stated that the Department would take steps to decentralise the system of processing of waste so as to reduce the burden on the dumpsite.

6.6 Open dumping of waste

Waste generators in certain areas were observed to be violating Rule 4 (2) of the Solid Waste Management Rules, 2016 by dumping waste in open spaces and water bodies, as seen during Joint Physical Verifications and reported in news articles, causing both environmental degradation and health risks.

Rule 4 (2) of the Solid Waste Management Rules, 2016 clearly mandates that no waste generator shall throw**,** burn, or bury the solid waste generated, on streets, open public spaces, outside his premises or in the drain or water bodies. In contravention to this rule, it was observed during JPVs (22 & 23 August 2022) that waste was being dumped in open spaces in Shillong and Jowai. It was seen that this practice was carried out even in wards where door to door collection was available. A news report from the Shillong Times 13 March 2022 issue (Page 3) also highlighted the open dumping of waste in a stream in Kabul Market, Tura. Dumping of waste in open spaces or streams not only damages the aesthetics of an area but also poses a serious health hazard.

Exhibit 6.27 & 6.28: Household waste dumped in open spaces in Shillong (Laitumkhrah & Lower Mawprem)

6.7 Conclusion

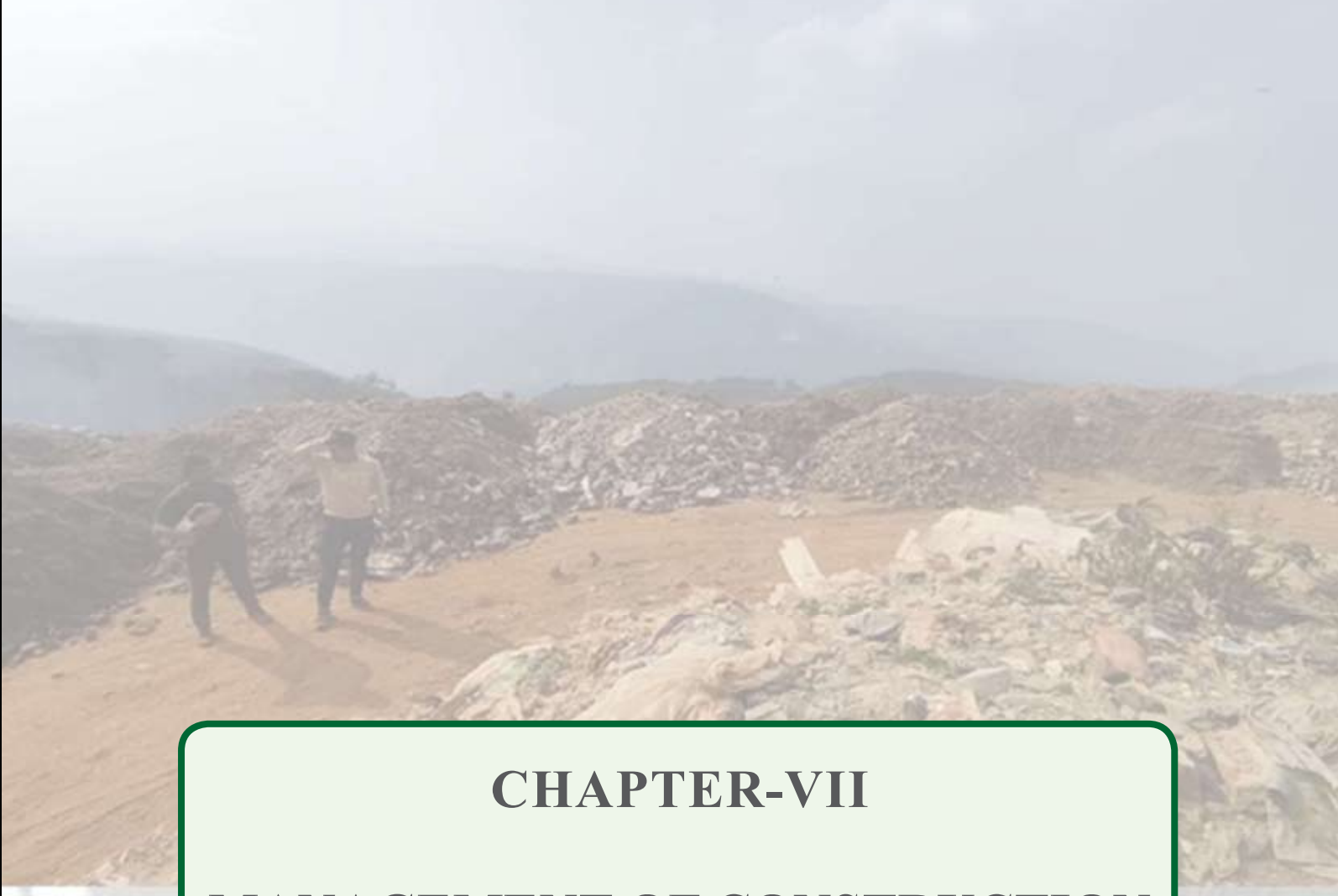
Processing of municipal waste and its scientific disposal have emerged as the weakest links in the state's solid waste management system. In Shillong urban areas only 20 *per cent* of waste collected was processed through composting plants while in other urban areas the extent of waste processing was negligible. The grave situation of solid waste processing and disposal was caused by two key factors, namely, one that most of the municipal waste ended up in landfill sites untreated, and two, that the landfill sites were either grossly inadequate to handle the burden on dumping or were entirely absent, resulting in dumping of untreated waste in *ad hoc* dumping sites.

The value chain in solid waste management was practically non-existent as composting was unsuccessful due to poor waste segregation practices. Failure to make the compost plant functional under SWM project rendered the expenditure incurred on these plants unfruitful. Little incentive was visible for informal sector to be involved in waste segregation.

Recommendations:

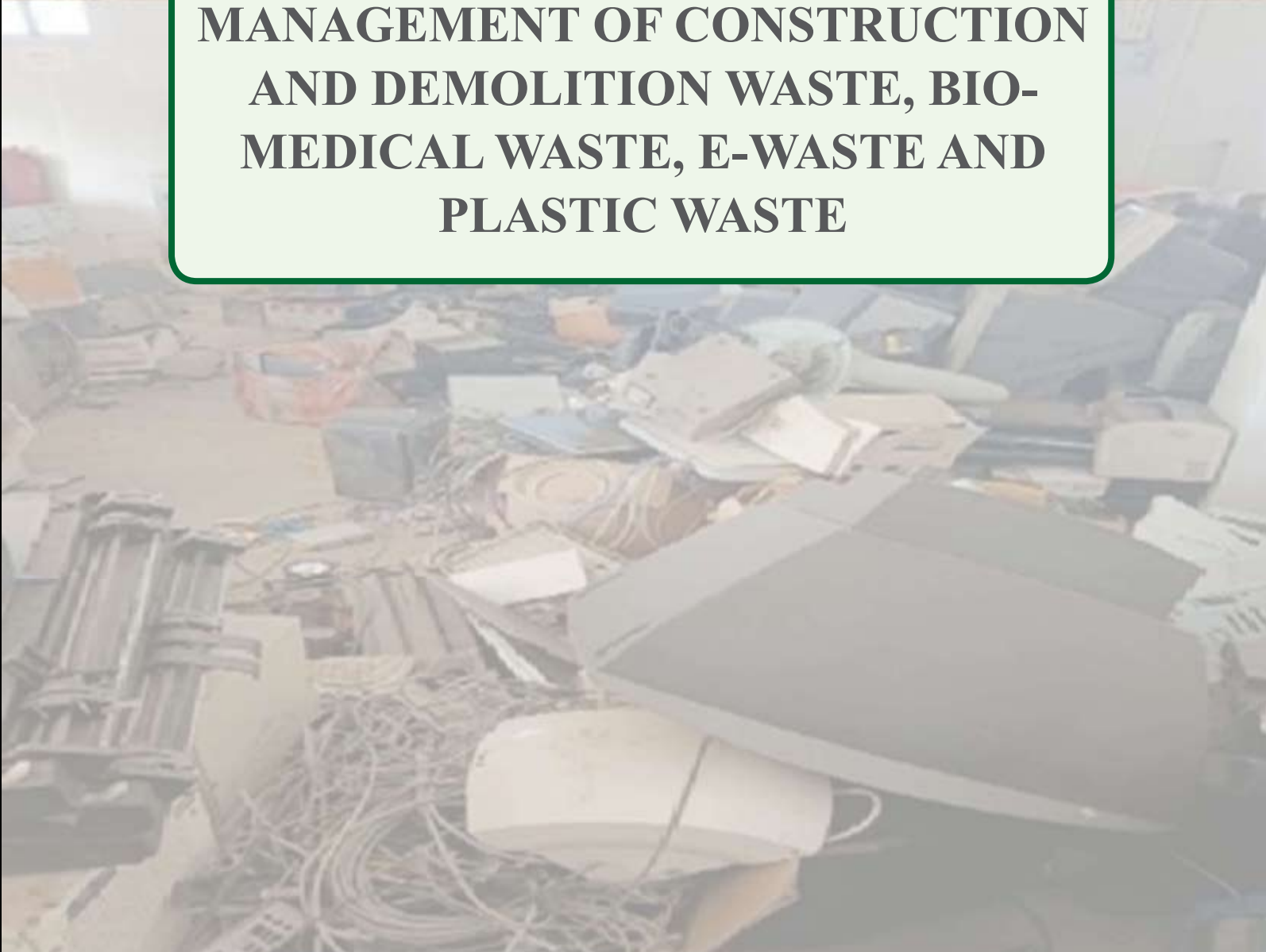
10. The State Government needs to urgently acquire suitable land for establishing modern SWM facilities and sanitary landfill to mitigate the risk of public health disasters and soil and water pollution.

11. Responsibility needs to be fixed for non-completion compost plant at Nongpoh & Tura and under-utilisation of the compost plant at Shillong.



CHAPTER-VII

MANAGEMENT OF CONSTRUCTION AND DEMOLITION WASTE, BIO-MEDICAL WASTE, E-WASTE AND PLASTIC WASTE



Chapter- VII
Management of Construction & Demolition Waste, Bio–Medical Waste, E-waste and Plastic Waste

The scope of this Performance Audit (PA) was to cover the solid waste management framework in Meghalaya with solid waste being defined as municipal solid waste (MSW), bio-medical waste (BMW), construction and demolition (C&D) waste, *e*-waste, and plastic waste. This chapter deals with the management of Construction & Demolition Waste, Bio–Medical Waste, E-waste and Plastic Waste.

7.1 Construction & Demolition Waste

MSWM Manual, 2000 stipulates that C&D waste, being predominantly inert in nature does not create chemical or biochemical pollution. Hence maximum effort should be made to reuse and recycle them. It was only in 2016 that separate rules for C&D waste was notified by Government of India. According to the Building Material Promotion Council, the total C&D waste generation estimated in India from buildings activities in the year 2020 was 4.11 lakh TPD[66] while the recycling capacity was 6,500 TPD. The information on quantum of C&D waste generated in the State was not available with MSPCB. Similarly, test-checked ULBs also do not have the data on C&D waste generation in their jurisdiction.

7.1.1 Meghalaya State Policy on Construction and Demolition Waste

Delay in finalising and approving the Meghalaya State Policy on Construction & Demolition (C&D) Waste, along with the lack of direction from relevant authorities, has hindered the implementation of C&D Waste Management Rules 2016 in the State.

Rule 9 (1) of the C&D Waste Management Rules 2016 stipulates that the Secretary in-charge of Development in the State Government shall prepare their policy document with respect to management of C&D waste in accordance with the provisions of these rules within one year from date of final notification (29 March 2016) of these rules. From records, it was seen that the draft Meghalaya State Policy on C&D Waste was forwarded by the Directorate to the Department of Urban Affairs on 7 January 2022, after a delay of almost five years. The State Government was also yet to approve the Meghalaya State Policy on C&D Waste. As a result of delay in approval of the State Policy, audit noticed the following:

- It was seen that neither the concerned Department of the State Government nor the ULBs/Town Committee had framed any directions or carried out any activities regarding C&D waste.
- As per Rule 8 of the C&D Waste Management Rules, the State Pollution Control Board shall monitor the implementation of these rules by the concerned local bodies and

[66] 150 million tons per year/365 day= 4.11 lakh TPD.

the competent authorities and the annual report shall be sent to the Central Pollution Control Board and the State Government for generating State level comprehensive data. Moreover, as per Rule 9 (2) of the C&D Waste Management Rules 2016, the concerned department in the State Government dealing with land shall be responsible for providing suitable sites for setting up of the storage, processing and recycling facilities for construction and demolition waste.

In the latest report submitted (29 July 2022) by MSPCB to CPCB, it was pointed out that the State Government was yet to finalise the Meghalaya State Policy on C&D Waste. It was also submitted that the site for collection and processing facility was also yet to be identified by the State Government. Thus, it could be seen that no concrete steps had been taken by the State Government to ensure implementation of the C&D Waste Management Rules 2016.

- Rule 6 of the C&D Waste Management Rules states that the ULBs/Town Committee were to issue directions with regard to proper management of C&D waste, chalk out stages, methodology and equipment, material involved in the overall activity and final clean up after completion of the construction and demolition, make arrangements and place appropriate containers for collection of waste and shall remove at regular intervals *etc*. In the absence of the State Policy on C&D waste, none of the selected ULBs/Town Committees had issued any directions or made any plans with regard to management of C&D Waste in their jurisdiction.

During the Exit Conference (May 2023), the Director, Urban Affairs Department stated that the Policy has been forwarded to the Cabinet for approval.

7.1.2 Comparison between Meghalaya SWM Bye Law and C&D Waste Management Rules 2016.

The Meghalaya Solid Waste Management Bye Law of 2020 requires Local Authorities to collect and dump Construction & Demolition (C&D) waste separately without mixing, but the practice of dumping C&D waste within landfill sites goes against national policy; thus, there is a need for the State Government and Local Authorities to establish appropriate storage, processing, and recycling facilities for C&D waste.

Section 5 (i) of the Meghalaya Solid Waste Management Bye Law, 2020 stipulates that the C&D waste should be collected by the respective Local Authority (Municipal boards, Town Committees or Dorbar Shnongs) without mixing with other solid waste and the Local Authority should develop and maintain an area specifically for dumping of C&D waste in a landfill site. The dumping of C&D within the landfill site is, however against the National policy[67] which stipulates that the department in the State Government dealing with land shall be responsible for providing suitable sites for setting up of the storage, provide processing and recycling facilities for C&D waste.

During JPV of Marten (SLF of Shillong), it was confirmed that C&D waste was dumped separately within the premises of Marten. Further, no processing or recycling of C&D waste were noticed. In reply to audit, the test checked ULBs/Town Committee

[67] Rule 9(2) of the C&D Waste Management Rules 2016.

admitted that they were yet to provide any processing facility of C&D waste. The State Government along with the ULBs should take up concrete steps to provide storage, processing and recycling facilities for C&D waste.

Exhibit 7.1 : Dumped C&D Waste and covered with loose soil in Marten, Shillong

7.2 Bio Medical Waste

GoI notified (July 1998) the Bio-medical Waste (Management and Handling) Rules, 1998, which provided a regulatory framework for management of BMW generated in the country. This was replaced by the Bio-medical Waste Management Rules, 2016 (BMW Rules, 2016) notified (March 2016) by GoI.

MSPCB is the authority designated for implementation of the provisions of these rules. Every occupier or operator handling BMW, irrespective of the quantity should obtain authorisation from MSPCB and shall hand over segregated waste to a common bio-medical waste treatment facility (CBMWTF) for treatment, processing and final disposal.

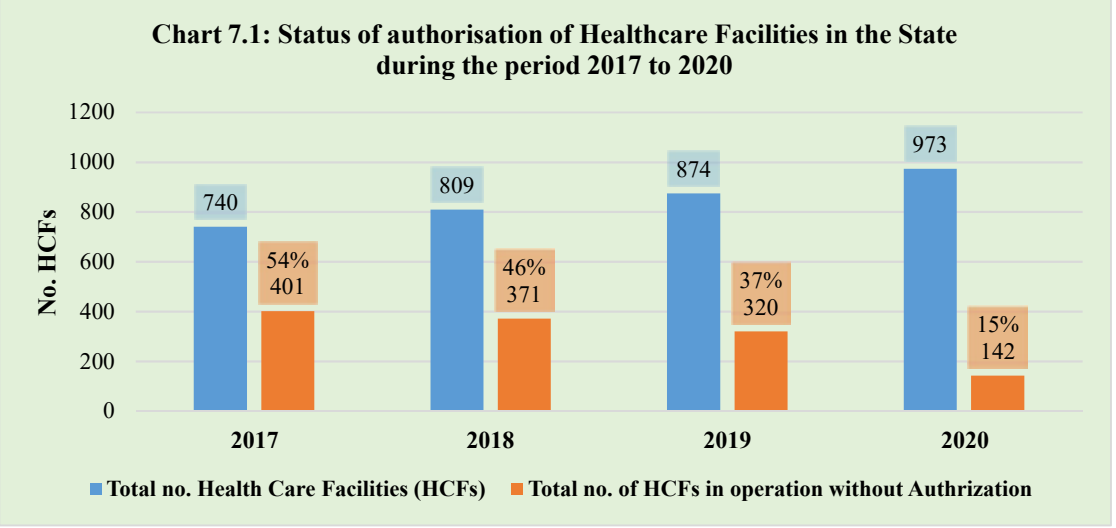
7.2.1 Authorisation status of Health Care Establishments

Healthcare facilities in Meghalaya showed a gradual decrease in unauthorised status from 2017 to 2020 under the Bio Medical Waste Management Rules 2016, but MSPCB should ensure compliance of BMW Rules, 2016 by all the HCFs in the State

Rule 10 of the Bio Medical Waste Management Rules 2016 states that every occupier or operator handling bio-medical waste, irrespective of the quantity shall make an application in Form II to the prescribed authority *i.e.* State Pollution Control Board for grant of authorisation.

The status of authorisation of Healthcare Facilities in the State during the period 2017 to 2020[68] is given in **Chart 7.1**.

[68] Position up to 2020 since Annual Reports of MSPCB are available only up to 2019-20.



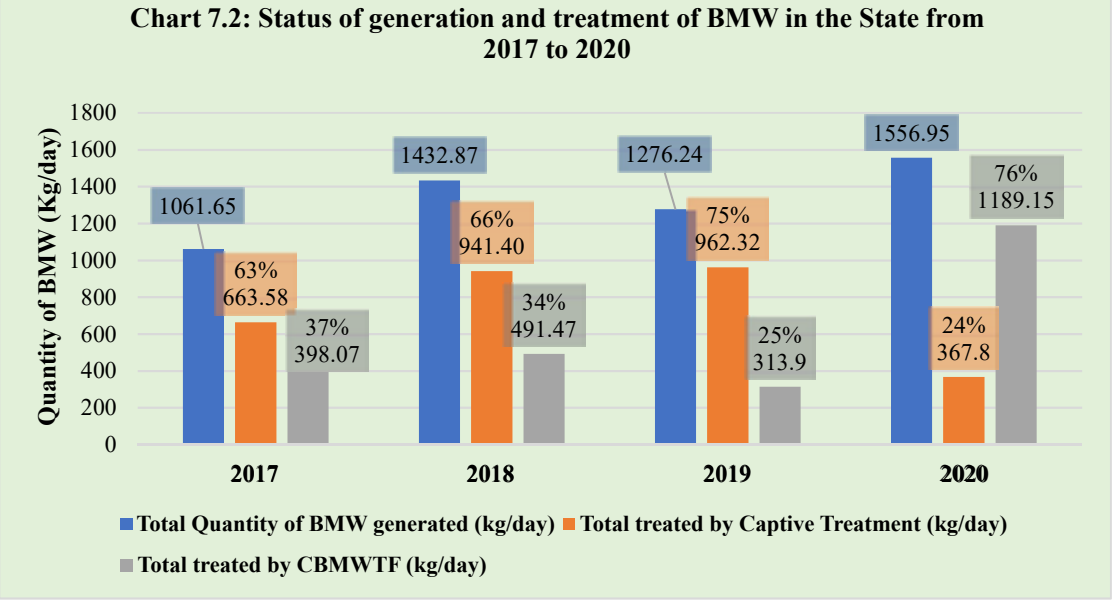
Source: CPCB Annual Reports of Bio Medical Waste.

Hence, it is evident from the **Chart 7.1** that the percentage of unauthorised HCFs were decreasing gradually from the year 2017 to 2020. However, MSPCB should ensure compliance of BMW Rules, 2016 by all the HCFs in the state.

7.2.2 Generation and treatment of Bio Medical Waste

Despite an increase in bio-medical waste (BMW) generation from 2017 to 2020, treatment by Common Biomedical Waste Treatment Facility (CBMWTF) surged from 37 per cent to 76 per cent, while captive treatment declined. However, scrutiny revealed operational issues with the sole CBMWTF in Shillong, casting doubt on the accuracy of reported data provided by MSPCB to CPCB.

The status of generation and treatment of BMW in the State during the period 2017 to 2020 as per the annual reports of CPCB is given in **Chart 7.2**.



Source: CPCB Annual Reports of Bio Medical Waste.

It can be seen from the chart above that there was an increase in the generation of BMW from 2017 to 2020. Also, the treatment of BMW by CBMWTF increased from 37 *per cent* to 76 *per cent* while the captive treatment was shown to have decreased by 63 *per cent* to 24 *per cent*. Further, during the year 2019 and 2020, an amount of 313.9 kg/day (25 *per cent)* and 367.8 kg/day (24 *per cent*) was shown to be treated by CBMWTF. Scrutiny of records, however revealed that from August 2018 to March 2021, the only CBMWTF in Shillong was not operational as pointed out in **Para 7.2.4.** Hence, MSPCB provided the unverified information to CPCB resulting in compilation of incorrect reports which raised questions about the reliability of data maintained by MSPCB.

7.2.3 Disposal of Bio Medical Waste

Except for Shillong Municipal Board, the test-checked ULBs and Town Committees in Meghalaya lacked Common Bio-Medical Waste Treatment and Disposal Facilities (CBMWTF) as required by BMW Rules, 2016 resulting in improper disposal practices that pose risks to public health and environmental contamination.

Exhibit 7.1: Openly dumped BMW in Tura

As per Schedule III (7) to BMW Rules, 2016, ULBs shall (a) provide or allocate suitable land for development of CBMWTF in their respective jurisdictions as per the guidelines of CPCB. During 2017-22, it was seen that none of the test checked ULBs/Town Committee except Shillong Municipal Board had a CBMWTF. In Tura, it was stated (October 2022) that the BMW was either disposed in the deep burials available in Rongkhon Songittal, the dumpsite of Tura or in the deep burials of the respective hospitals. In Jowai and Nongpoh, BMW was disposed by the hospitals concerned and were not collected by the JMB and Nongpoh Town Committee. During JPV of Rongkhon Songittal, the dumping site of Tura Municipal Board, it was noticed that BMW such as syringes, ampoules, *etc.* were openly dumped as shown in ***exhibit 7.1***.

Improper disposal of BMW would not only affect public health but also lead to contamination of the surrounding environment.

7.2.4 Status of CBMWF in Shillong

Non-functioning incinerator of CBMWTF Shillong attracted imposition of Environmental Compensation of ₹ 0.82 crore on Shillong Municipal Board by the CPCB.

During audit, it was seen that the CPCB had conducted an inspection of the CBMWTDF at Marten, Shillong on 4 December 2018 and found the following observation:

a. Unit did not have a valid authorisation under BMW Rules, 2016;
b. Separate space for treated and untreated BMW was not provided;
c. Incinerator was not in operation since August 2018 and BMW was being openly burned and dumped;
d. No treatment equipment like autoclave/shredder was provided for treatment and disposal of red, blue and white category of waste, *etc*.

As a result of non-compliance of SMB to the Bio Medical Waste Rules 2016, the CPCB imposed a fine of ₹ 8.60 lakh as Environmental Compensation for period from 4 December 2018 to 27 February 2019[69]. It further ordered that an amount of ₹ 10,000 per day of Environmental Compensation from 28 February 2019 till compliance to the provisions of the BMW Rules was payable by SMB.

Further scrutiny of records revealed that an agreement for setting up of the CBMWTDF at Shillong and Tura was signed (4 June 2020) by the Director, Urban Affairs Department and the supplier (M/S S.M Enterprise). The CBMWTDF at Shillong was made operational in March 2021 while the CBMWTDF at Tura was yet to be made operational till date of audit (October 2022).

Hence, because of non-compliance to the BMW Rules 2016, SMB was liable to pay the CPCB an amount of ₹ 81.70 lakh (₹ 8.60 lakh + 731 days X ₹ 10,000) as Environmental Compensation.

During the Exit Conference (May 2023), the Department stated that the Environmental Compensation was not paid by the Shillong Municipal Board, and it has also not been insisted by MSPCB. It was stated that the new CBMWTDF was functioning in Marten since March 2021.

7.3 E-Waste

Ministry of Environment Forest and Climate Change (MoEFCC), Government of India notified (March 2016) the E-Waste (Management) Rules, 2016 (EWM Rules, 2016) which came into effect from 1 October 2016. These rules are applicable to every producer, consumer or bulk consumer, collection centre, dismantler and recycler of e-waste involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components specified in Schedule-I of these Rules.

7.3.1 Producer Responsibility Organisation registered with MSPCB

In Meghalaya, there are three registered Producer Responsibility Organisations (PROs) based in Shillong responsible for collecting e-waste, but there was a lack of dedicated collection vehicles, insufficient storage facilities for categorisation, and lack of awareness, hindering effective implementation of e-waste management as per E-Waste Rules, 2016.

[69] at the rate of ₹10,000 per day since day of inspection.

'Producer Responsibility Organisation' (PRO) means a professional organisation authorised or financed collectively or individually by producers, which can take the responsibility for collection and channelisation of e-waste generated from the 'end-of-life' of their products to ensure environmentally sound management of such e-waste. There are only three registered PROs in Meghalaya and all of them are based in Shillong. Thus, other urban areas of the State were yet to be covered by the PROs for collection of e-waste. The names of the registered PRO/ collection centre on behalf of a registered PRO are (i) M/s Karo Sambhav (ii) M/s RLG Reverse Logistics India Pvt. Ltd. and (iii) M/s J.S Enterprise (authorised collector on behalf of PRO Hulladek Recycling). A JPV of the PROs was conducted (January 2023) and the following observation were noticed:

- None of the PROs had their own collection and transportation vehicle and they were hiring vehicles at the time of collection. It was thus difficult to collect and transport various categories of e-waste as envisaged in Schedule-I of the E-Waste Rules, 2016.
- The storage space of all the PROs did not have any partition or separate space to store separate various categories of e-waste as envisaged in Schedule-I of the E-waste Rules, 2016.
- M/s RLG Reverse Logistics India and M/s J.S Enterprise informed that unwillingness by general public as well as organisations to deposit e-waste through authorised collection centres and general lack of awareness was one of the biggest challenges faced by the collection centre.

Exhibit 7.2: Unorganised Storage of e-waste at M/s Karo Sambhav

Exhibit 7.3: Storage section of M/s RLG Reverse Logistics India

Exhibit 7.4: Storage section of M/s J.S Enterpris

7.3.2 Inventory of e-waste in the state of Meghalaya

The Meghalaya State Pollution Control Board (MSPCB) has failed to maintain an inventory of e-waste generation as required by E-Waste (Management) Rules 2016, leading to a lack of comprehensive data for comparison with e-waste collection by Producer Responsibility Organisations.

As per the annual report submitted by the MSPCB to CPCB from 2017-18 to 2020-21, the status of e-waste collection is detailed in **Table 7.1**.

Table 7.1: Status of e-waste collection in the State of Meghalaya

FY	Collection centres	Name	Qty of e-waste collected (Kg)
2017-18	1 collection centre	M/s Karo Sambhav	1,500
2018-19	2 collection centres	M/s Karo Sambhav & M/s RLG	840
2019-20	3 collection centres	M/s Karo Sambhav, M/s RLG & M/s Kenny D Kharkongor (scrap dealer)	4,714.34
2020-21	3 collection centres	M/s Karo Sambhav, M/s RLG & M/s Fabshop Technology	6,175.09

Source: Information furnished by MSPCB.

As per Schedule-IV of E-Waste (Management) Rules 2016, it is the duty of State Pollution Control Boards to prepare and maintain an inventory of e-waste. Though MSPCB was maintaining a list of bulk generators in the State, it did not make any inventory of e-waste generation by these bulk consumers. As a result, audit could not compare the e-waste generation and collection done by the PROs. Secondly, it was noticed that various central and State Government department offices and financial institutions like office of the Principal Accountant General (Audit) and (Accounts & Entitlement), Fisheries Department and Reserve Bank of India; educational institutions like Shillong Law College, Institute of Hotel Management; and defence establishments like the Director General, Assam Rifles were not included in the list of bulk generators of e-waste prepared by MSPCB (the names provided here are illustrative and not exhaustive). Further, the list was not updated periodically to incorporate all kinds of bulk generators. As such, a comprehensive inventory of e-waste generation was yet to be prepared by MSPCB.

The Member Secretary, MSPCB stated that the task of preparation of inventory of e-waste generation had been outsourced to the Indian Institute of Waste Management, Bengaluru but the report was yet to be finalised. The reply is not tenable as the MSPCB has failed to comply with the provisions of the E-Waste (Management) Rules, 2016 even after a lapse of seven years from the date of notification of the rules.

7.3.3 Disposal of E-Waste mixed with Municipal Solid Waste

E-Waste found to be mixed with Municipal Solid Waste in Tura solid waste disposal site in contradiction to the E-Waste (Management) Rules, 2016.

As per Schedule-IV of the E-Waste (Management) Rules 2016, it was the duty of ULBs to ensure that e-waste if found to be mixed with Municipal Solid Waste is properly segregated, collected and is channelised to authorised dismantler or recycler.

However, during JPV conducted in Tura Municipal Board (TMB), e-waste *i.e.,* printer cartridges, *etc*. were seen lying without required care within the premises of the dumpsite.

Exhibit 7.5: e-waste disposed openly in TMB dumpsite

7.4 Plastic Waste

MoEFCC notified (February 2011) the Plastic Waste (Management and Handling) Rules, 2011 (PW Rules, 2011). It was replaced by the Plastic Waste Management Rules, 2016 (PWM Rules, 2016) notified (18 March 2016) by Government of India. These rules shall apply to every waste generator, local body, manufacturer, importers and producer.

As per Section 7.4.3 of MSWM Manual 2016, reuse and recycling of plastic waste are the preferred methods for managing plastic wastes after reduction. However, as mentioned, plastics cannot be recycled indefinitely; each recycling cycle reduces the strength and utility of the plastic.

7.4.1 Status of submission of Annual Return of Plastic Waste

The plastic waste management reporting by ULBs has been inconsistent as evidenced by incomplete and delayed annual reports, discrepancies between submitted data and CPCB estimates, and the lack of MSPCB's effective oversight and guidance to ensure accurate reporting.

As per Rule 17 (2) of Plastic Waste Management Rules 2016, every local body shall prepare and submit an annual report in Form–V to the concerned Secretary-in-charge of the Urban Development Department under intimation to the concerned State Pollution Control Board or Pollution Control Committee by the 30th of June, every year. However, the status of Plastic Waste Management in Meghalaya as per records submitted by MSPCB is detailed in **Table 7.2**.

Table 7.2: Compilation of Annual Report submitted to the MSPCB from 2017-22

Sl. No.	Name of the Local Body	PW generated in (in TPA[70])				
		2017-18	2018-19	2019-20	2020-21	2021-22
1	Shillong Municipal Board	6.276	Not submitted	Not submitted	Not submitted	Not submitted
2	Jowai Municipal Board	2.8	1260	5040	Not submitted	Not submitted
3	Tura Municipal Board	2.78	Not submitted	Not submitted	Not submitted	488.4
4	Shillong Cantonment Board	2.12	Not submitted	Not submitted	Not submitted	Not submitted
5	Baghmara Municipal Board	0.4	Not submitted	Not submitted	Not submitted	Not submitted
6	Resubelpara Municipal Board	0.32	Not submitted	Not submitted	0.516	Not submitted
7	Williamnagar Municipal Board	0.4	3	3	3	Not submitted

From the Table above it could be seen that, during five years (2017-22) none of the Local bodies had submitted Annual Report for all the years. Shillong Municipal Board, Shillong Cantonment Board and Baghmara Municipal Board has submitted only one

[70] Tons per Annum.

Annual Report in respect of 2017-18, thereafter no Report was furnished. Other local bodies had submitted ranged from two (Jowai Municipal Board) to four (Williamnagar Municipal Board).

During the Exit Conference (May 2023), the Member Secretary, MSPCB stated that directions are being issued regularly to submit their replies in time.

As per the CPCB Annual Report 2019-20 on implementation of PWM Rules 2016, the per capita plastic waste generation was appox. 2500 grams/year. On that basis, the plastic waste generation in the seven ULBs of Meghalaya are given in **Table 7.3**.

Table 7.3: Quantum of plastic waste generation per annum

Sl. No.	Name of the Local Body	Population as per 2011 census	Quantum of plastic waste generated per annum[71] (Tons)
1	Shillong Municipal Board	143,229	358
2	Jowai Municipal Board	28,430	71
3	Tura Municipal Board	74,858	187
4	Shillong Cantonment Board	11,930	30
5	Baghmara Municipal Board	13,131	33
6	Resubelpara Municipal Board	19,595	49
7	Williamnagar Municipal Board	24,597	61

Thus, it could be seen from the above that the reports submitted by the ULBs were not consistent with the data generated by CPCB and most of the ULBs did not even submit their reports on time. There was nothing on record to indicate that the MSPCB had taken any action to ensure submission of reports by ULBs nor did they provide necessary guidance to the ULBs to rectify/submit accurate information. In fact, MSPCB had merely forwarded the reports to CPCB without any scrutiny.

7.4.2 Setting up of infrastructure for plastic waste management

The selected ULBs and Town Committees in Meghalaya have not taken effective action to establish infrastructure for plastic waste management or provide accurate information on plastic waste, revealing a lack of commitment from both the local authorities and higher administrative bodies, while on-site observations demonstrate mixed disposal with MSW, limited segregation efforts, and challenges related to recycling capacity.

As per Rule 6 (1) of the PWM Rules 2016, every local body shall be responsible for development and setting up of infrastructure for the management of plastic waste. Moreover, as per Form-V of PWM Rules 2016, the ULBs should submit the quantum of plastic waste generated, collected, reused, recycled or disposed in their respective jurisdictions. None of the selected ULBs/Town Committee were able to furnish information on the quantum of plastic waste collected, processed and disposed during 2017-22.

[71] 0.0025 tonne X population.

During January 2017, the MSPCB directed the Deputy Commissioners of all the districts of Meghalaya *"to ensure for development and setting up of infrastructure for segregation, collection, storage, transportation, processing and disposal of the plastic waste either on its own or by engaging agencies or producers".* No infrastructure was however created in Shillong or Jowai by the respective Deputy Commissioners.

In reply (December 2022), the Deputy Commissioner, Ri-Bhoi District stated that the matter was dealt with by the Nongpoh Town Committee. The reply is not tenable as the Nongpoh Town Committee had not undertaken any activity/programme with regard to setting up of infrastructure for plastic waste management. Reply from Deputy Commissioner, West Garo Hills District is yet to be received in this regard. This indicates the lackadaisical attitude of the ULBs, MSPCB as well as the Deputy Commissioners to tackle the growing problem of plastic waste.

During JPV the following were noticed:

- In Shillong region, plastic waste was mixed with MSW and efforts were seen to segregate them either manually or by using Compost Plant Machineries which was then sent to cement factories for use as RDF. Other recyclable portion of plastic waste was being sorted and transported by the recyclers that are operating inside Marten. As per SMB, they processed about 36 TPD of recyclables. Though SMB was unable to quantify the amount of plastic waste sent to the cement companies, scrutiny of records of MSPCB revealed that only 1.04 tonnes of plastic waste was processed during 2021-22 by cement company.

Exhibit 7.6: Plastic baling machine at Marten, Shilllong

- In Jowai, no segregation was carried out and all the plastic waste was being disposed in dumpsites.
- In Tura, one group of workers was segregating and sorting plastic waste from MSW and they were processing one TPD of recyclables. The rest were being dumped in Ronkhon Songital dumpsite, Tura. The proprietor of the informal group informed that his capacity could be augmented if one plastic baling machine was made available to him.

Exhibit 7.7: Informal Sector workers working on segregation at Tura

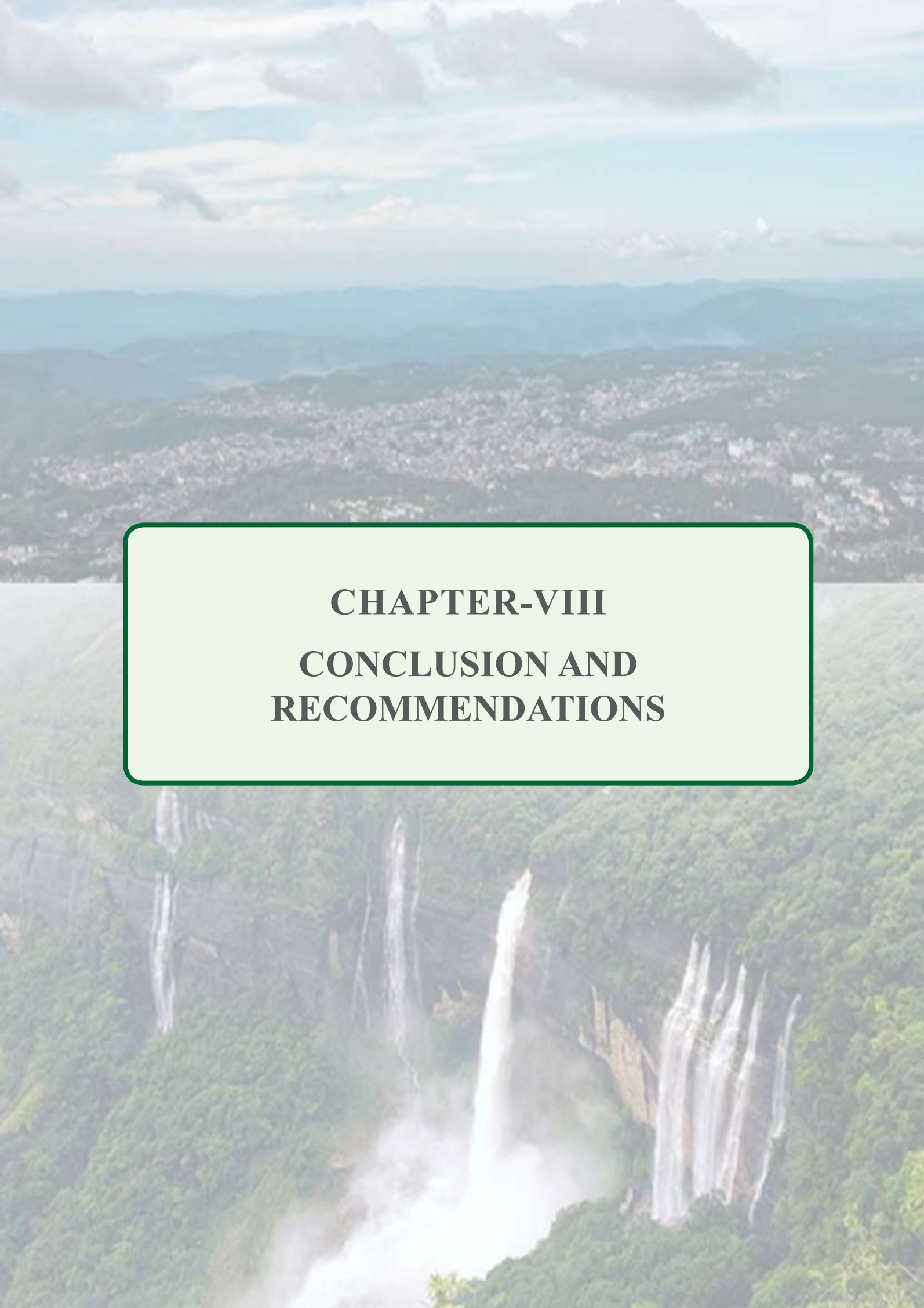
- In Nongpoh, no segregation was carried out and all the plastic waste was dumped in the Umshangling dumpsite.

7.5 Conclusion

Health care institutions were functioning without authorisation and unauthorised disposal of biomedical waste and e-waste was observed in TMB. SMB was imposed a fine amounting to ₹ 0.82 crore as Environmental Compensation by the CPCB due to non-compliance to BMW Rules, 2016. The accuracy and reliability of data in the annual reports submitted with regards to BMW was not verified by MSPCB. Similarly, annual reports submitted by ULBs regarding plastic waste generation were found to be inconsistent with the data generated by CPCB. In addition, the list of bulk generators of e-waste maintained by MSPCB did not include various central and state offices and other institutions and an inventory of e-waste generation was not maintained. There are only three registered Producer Responsibility Organisation (PROs) for collection of e-waste in Meghalaya. Infrastructure for the efficient management of Plastic waste and C&D waste was non-existent in all the test checked urban areas.

Recommendations:

12. ***The State Government should expedite preparation of State policy on C&D waste without any further delay.***
13. ***The MSPCB needs to ensure that all health care facilities obtain necessary authorisation for their functioning and adhere to the BMW Rules.***
14. ***The State Government must promote awareness and adherence to e-waste management regulations to ensure that e-wastes are exclusively channelled through authorised Producer Responsibility Organisations (PROs). Additionally, the MSPCB should maintain a database of bulk generators and an inventory of e-waste.***
15. ***Greater emphasis needs to be placed on proper disposal of e-waste to minimise the risk of toxic pollutants contaminating the soil, air, water bodies, etc. and sensitise the public at large about benefits of disassembling, repairing and recycling of e-waste.***
16. ***The MSPCB should analyse the data/information in the reports submitted by ULBs/ other bodies before compiling and forwarding to CPCB since unreliable data is likely to result in incorrect/skewed action taken by the management. They should also ensure timely submission of reports vis-à-vis various waste management rules by repeated follow up.***



CHAPTER-VIII

CONCLUSION AND RECOMMENDATIONS

Chapter- VIII
Conclusion & Recommendations

8.1 Conclusion

Based on the analysis in the preceding paragraphs, Audit concludes that the function of Municipal Waste Management in the state of Meghalaya is severely hampered due to weak institutional mechanism that is manifested in none of the multiple agencies involved in this process being compliant with the responsibilities assigned to them under the Meghalaya SWM Rules. SWM functions are further hampered by the fact that though a state wise policy has been put in place, none of the agencies involved, *i.e.* Municipal Boards, Cantonment Board (in Shillong) and Autonomous District Councils had formulated their Bye Laws respectively. The Town Committees were found to be practically non-existent as a result of which habitations covered under the census towns were completely deprived of functional waste management systems. At the government level, Urban Affairs department was hamstrung with lack of data on municipal waste generation to be in any position to take effective policy based initiatives to handle the municipal waste scientifically and effectively. Periodic Surveys for assessment of waste generation was not conducted in the test checked ULBs/Town Committee except in Shillong. As a result, inaccurate methods of evaluation such as per capita estimation and estimation of quantity of transported waste was adopted in Tura and Jowai. Data was unavailable for Nongpoh Town with regard to waste generation, segregation, collection, and disposal from 2017-18 to 2020-21. Similarly, MSPCB's role making effective intervention in controlling pollution in and around dumping ground seemed ineffective since it had no reliable data on waste generated and collected.

Waste Management Plans (either short term or long term) were not prepared in the test checked ULBs/Town Committee except for Shillong Municipal Area, where a City Solid Waste Action Plan had been prepared by the Shillong Municipal Board (SMB) but the same was still awaiting approval. A contingency plan was neither envisaged in the Meghalaya State Waste Management Policy and Strategy nor addressed by any of the test checked ULBs/Town Committee. These delays in preparation and approval of requisite legislations and plans had inhibited the implementation of SWM activities. Further, shortage of supervisory staff in the Municipal Boards and Town Committees as well as lack of trained staff for collection and transport of municipal waste resulted in unscientific management of municipal waste in the urban areas.

Analysis of financial resources for the solid waste management in Meghalaya has brought out that over a period of previous five years, bulk of the financial resource

has been received under the Asian Development Bank's external funded project of NERCCDIP. However, the NERCCDIP funding agreement being for a period of 10[72] years and for specified activities, this remained a finite source of fund. The Municipal Boards were unable to meet even the operational costs of collection and disposal of municipal waste due to poor collection of user charges. In the absence of any significant budgetary support from the state government, and lack of own funds in the Municipal Boards, the SWM activities in Meghalaya suffer from paucity of funds.

Segregation of waste at different levels was either absent or partial in all the test-checked ULBs. Segregation of domestic hazardous waste was not done and sanitary waste was not collected separately. Hence, mixed waste was transported to landfills. Household bins for source segregation were purchased and distributed only in Shillong and Jowai but not in Tura and Nongpoh. Even though bins were distributed in Jowai, source segregation of waste had not yet been carried out.

During joint physical verification, majority of the workers handling waste were not utilising the available safety equipment even though protective gears were procured by the ULBs. The vehicles were not covered during transportation resulting in foul odour emanating from the uncovered waste. None of the available vehicles were equipped with Management Information Systems such as GPS and GIS, due to which tracking of transportation vehicles was not carried out.

Processing of municipal waste and its scientific disposal have emerged as the weakest links in the state's solid waste management system. In Shillong urban areas only 20 *per cent* of waste collected was processed through composting plants while in other urban areas the extent of waste processing was negligible. The grave situation of solid waste processing and disposal was caused by two key factors, namely, one that most of the municipal waste ended up in landfill sites untreated, and two, that the landfill sites were either grossly inadequate to handle the burden on dumping or were entirely absent, resulting in dumping of untreated waste in ad hoc dumping sites.

The value chain in solid waste management was practically non-existent as composting was unsuccessful due to poor waste segregation practices. Failure to make the compost plant functional under SWM project rendered the expenditure incurred on these plants unfruitful. Little incentive was visible for informal sector to be involved in waste segregation.

Health care institutions were functioning without authorisation and unauthorised disposal of biomedical waste and e-waste was observed in TMB. SMB was imposed a fine amounting to ₹0.82 crore as Environmental Compensation by the CPCB due

[72] Tranche 1- Date of loan agreement-04.08.2009, Loan closing date-22.06.2019.
Tranche 2- Date of loan agreement-19.11.2012, Loan closing date-22.06.2019.

to non-compliance to BMW Rules 2016. The accuracy and reliability of data in the annual reports submitted with regards to BMW was not verified by MSPCB. Similarly, annual reports submitted by ULBs regarding plastic waste generation were found to be inconsistent with the data generated by CPCB. In addition, the list of bulk generators of e-waste maintained by MSPCB did not include various central and state offices and other institutions and an inventory of e-waste generation was not maintained. There are only three registered Producer Responsibility Organisation (PROs) for collection of e-waste in Meghalaya. Infrastructure for the efficient management of Plastic waste and C&D waste was non-existent in all the test checked urban areas.

8.2 Recommendations

Recommendation 1: The State Government may ensure that the required Bye laws under the Solid Waste Management Rules, 2016 are framed and implemented by the ULBs and ADCs in the State. The State Government may take up the matter with Shillong Cantonment Board for effective implementation of the SWM Act and Rules.

Recommendation 2: The Urban Affairs Department needs to assist ULBs/ local traditional bodies involved in SWM for preparation of Long-term, Mid-term and Short-term action plans to enhance the efficacy of solid waste management.

Recommendation 3: The Urban Affairs Department should encourage and promote involvement of informal sector in solid waste management (SWM) activities to increase efficiency of SWM.

Recommendation 4: Considering the intricate administrative framework encompassing agencies engaged in solid waste management (SWM) activities within urban areas of Meghalaya, it is imperative for the State Government to establish robust coordination among these entities and ensure vigilant monitoring of the diverse provisions pertaining to SWM.

Recommendation 5: Necessary steps should be taken for augmentation of sustainable financial resources of the Municipal Boards including system of collection of user charges and for strengthening their administrative capacity by recruiting the required manpower and imparting regular training to them to improve efficiency and effectiveness in solid waste collection, transportation and processing.

Recommendation 6: The State Government should encourage segregation of waste at source by devising a system for incentivising waste generators and collectors

for proper segregation of waste and through public awareness campaigns and regular meetings with local traditional bodies, group housing associations, and NGO.

Recommendation 7: Municipal Boards may consider option of installing community waste bins for collection of waste in a segregated manner apart from providing bins to each household.

Recommendation 8: ULBs should sensitise workers involved in handling waste to ensure compliance to occupational health and safety protocols by wearing safety gear and other protective equipment.

Recommendation 9: The vehicles procured should be suitably designed to collect and transport segregated waste efficiently so as to prevent mixing of segregated waste during various stage of SWM.

Recommendation 10: The State Government needs to urgently acquire suitable land for establishing modern SWM facilities and sanitary landfill to mitigate the risk of public health disasters and soil and water pollution.

Recommendation 11: Responsibility needs to be fixed for non-completion compost plant at Nongpoh & Tura and under-utilisation of the compost plant at Shillong.

Recommendation 12: The State Government should expedite preparation of State policy on C&D waste without any further delay.

Recommendation 13: The MSPCB needs to ensure that all health care facilities obtain necessary authorisation for their functioning and adhere to the BMW Rules.

Recommendation 14: The State Government must promote awareness and adherence to e-waste management regulations to ensure that e-wastes are exclusively channelled through authorised Producer Responsibility Organisations (PROs). Additionally, the MSPCB should maintain a database of bulk generators and an inventory of e-waste.

Recommendation 15: Greater emphasis needs to be placed on proper disposal of e-waste to minimise the risk of toxic pollutants contaminating the soil, air, water

bodies, etc. and sensitise the public at large about benefits of disassembling, repairing and recycling of e-waste.

Recommendation 16: The MSPCB should analyse the data/information in the reports submitted by ULBs/ other bodies before compiling and forwarding to CPCB since unreliable data is likely to result in incorrect/skewed action taken by the management. They should also ensure timely submission of reports vis-à-vis various waste management rules by repeated follow up.

Shillong **(Shefali Srivastava Andaleeb)**
The: 05 August 2024 **Principal Accountant General (Audit), Meghalaya**

Countersigned

New Delhi **(Girish Chandra Murmu)**
The: 07 August 2024 **Comptroller and Auditor General of India**

APPENDICES

Appendix I

Details of urban towns in Meghalaya as per Census 2011

(Reference: Paragraph 1.4)

Sl. No.	District	Name of urban towns	Administrative status	Population as per Census 2011
1	East Khasi Hills	Shillong Municipal Board	Municipality	1,43,229
2		Shillong Cantonment	Cantonment Board	11,930
3		Mawlai	Census Town	55,012
4		Pynthorumkhrah	Census Town	27,219
5		Nongmynsong	Census Town	15,017
6		Mawpat	Census Town	6,184
7		Umpling	Census Town	8,214
8		Nongthymmai	Census Town	8,529
9		Madanriting	Census Town	38,004
10		Lawsohtun	Census Town	29,194
11		Nongkseh	Census Town	4,846
12		Umlyngka	Census Town	7,381
13		Sohra	Census Town	11,722
14	West Garo Hills	Tura	Municipality	74,858
15	West Jaintia Hills	Jowai	Municipality	28,430
16	South Garo Hills	Baghmara	Municipality	13,131
17	East Garo Hills	Williamnagar	Municipality	24,597
18	North Garo Hills	Resubelpara	Municipality	19,595
19	Eastern West Khasi Hills	Mairang	Town Committee	14,363
20	West Khasi Hills	Nongstoin	Town Committee	28,742
21	Ri Bhoi	Nongpoh	Town Committee	17,055
22		Umroi	Census Town	8,198

Appendix II

Position of supervisory posts in selected ULBs/Town Committee *vis-à-vis* the recommendations of the MSWM manual 2016

(Reference: Paragraph 3.10)

(A) Position in Shillong Municipal Board

Name of post recommended as per MSWM Manual	No of post recommended	No of similar nature of post filled up in SMB for SWM	Shortfall (-) / Excess(+)
For cities having population between 1 to 2.5 lakh			
Graduate engineer/Health Officer.	1	2	(+)1
Junior Engineer	1	2	(+) 1
Chief Sanitary Inspector or Sanitation Officer	1	0	(-) 1
Sanitary Inspector	3	6	(+) 3
Sanitary Sub-inspector	6	0	(-) 6
Sanitary Supervisors	11	5	(-) 6
Total	**23**	**15**	**(-) 8**

(B) Position in Tura Municipal Board

Name of post recommended as per MSWM Manual	No of post recommended	No of similar nature of post filled up in TMB for SWM	Shortfall (-) / Excess (+)
For cities having population between 50000 to 1 lakh			
Junior Engineer	1	1	-
Chief Sanitary Inspector or Sanitation Officer	1	Nil	(-) 1
Sanitary Inspector	1	1	-
Sanitary Sub-inspector	3	2	(-) 1
Sanitary Supervisors	6	3	(-) 3
Total	**12**	**7**	**(-) 5**

(C) Position in Jowai Municipal Board and Nongpoh Town Committee

Name of post recommended as per MSWM Manual	No of post recom-mended	No of similar nature of post filled up for SWM	Shortfall (-) / Excess (+)	No of similar nature of post filled up for SWM	Shortfall (-) / Excess (+)
		Jowai Municipal Board		**Nongpoh Town Committee**	
Sanitary Inspector	1	1	-	Nil	(-) 1
Sanitary Sub-inspector	1	Nil	(-) 1	Nil	(-) 1
Sanitary Supervisors	2	Nil	(-) 2	Nil	(-) 2
Total	**4**	**1**	**(-) 3**	**Nil**	**(-) 4**

Appendix III

Expenditure incurred on dumping of waste in private lands by JMB during the period from January 2022 to March 2023

(Reference: Paragraph 6.5.2)

Sl. No.	Particulars of Bill	Particulars of work done	Expendi-ture incurred	POL	Dates of disposal
1	Shri. H. Phawa	Being cost of waste disposal and JCB for making approach road for pit at Mutong	17,900	-	07-Mar-22
2	Self	Being work done by JCB by Shri Pyrkhat Shylla for excavation deep pit garbage car rage and garbage loading by dumping in pit at Mukhla, and bill for Shri. Morda Uru Laloo, land use for deep pit at Riatmuke, Ladthalaboh	3,36,200	5,000	20,21,24,25/ May/2022 and 1,2,6,7,8, 9,10,11/ June 2022
3	Shri. M. Passah, A.E.	Being cost of payment advance for meeting and lifting transportation and disposal of waste from Jowai town to present dumping site.	1,50,000	-	5,6/January/2022 & 19/Feb/2022
4	Shri. S. Bareh	Being loading of waste from iewmusiang.	2,20,000	-	21,22/April/2022
5	SHRI. K. Ryngkhlem	Being clearing the garbage at Wapung.	32,600	-	31/March & 1,2,4/ April 2022
6	Branch Manager, Punjab National Bank.	Being cost paid to Shri.D. Siangshai, for collection of garbage JMB TRUCK and transporting the same to dumper truck designated place.	2,33,400	-	20,23,25,28,29, 30/ July 2022
7	Shri. D. Siangshai	Being cost of collection of garbage from JMB truck and transporting the same to designated place.	3,92,600	-	2,3,4,5,6,8,9,10/ August 2022
8	Shri Pyrkhat Shylla	Being cost of collection of garbage from JMB truck and transportation to designated place	4,85,651	8,349	21, 23, 25/ June & 4, 5, 7, 8, 9, 11, 12, 13, 15, 16/July 2022
9	A. Phawa	Loading and lifting of garbage near DC office and near Thomas Jones College	76,000	-	21,22,23,24/April 2022
Total			**19,44,351**	**13,349**	

www.cag.gov.in/ag/meghalaya/en