

## Chapter II

### Strategy and Planning of Solid Waste Management

#### 2.1 State Policy and Solid Waste Management Strategy

Rule 11(a) of SWM Rules, 2016, stipulates that the Secretary, Urban Development Department in the State should prepare a State Policy and SWM strategy, consistent with SWM Rules, 2016, National Policy on SWM and National Urban Sanitation Policy of the MoUD, in a period not later than one year from the date of notification of SWM Rules, 2016, *i.e.*, by April 2017. The State Policy and SWM strategy should be prepared in consultation with stakeholders including representatives of waste pickers, SHGs and similar groups working in the field of waste management. Rule 23 of SWM Rules, 2016 further required that a State Level Advisory Body<sup>59</sup> should be constituted within six months from the date of notification (April 2016) of the Rules.

The State Level Advisory Body (SLAB) in the State was constituted<sup>60</sup> in July 2017 and the State Policy and Strategy on Solid Waste Management was issued in September 2018<sup>61</sup>.

#### 2.1.1 Compliance to the activities prescribed in the State Policy

The State policy stipulates (Para 11) that the ULBs shall make all efforts to implement the prescribed activities as per the timelines. The compliance observed in audit against the activities are given in **Table-2.1**.

**Table-2.1: Status on compliance in implementation of activities by test-checked ULBs as mandated in the State Policy**

Sl. No	Activity	Timelines for implementation from date of notification of the policy	GHMC	14 test-checked other ULBs
1.	Identification of suitable sites for setting up Solid Waste processing facilities.	6 months (by March 2019)	Existing dumpsite at Jawaharnagar was reclaimed and Solid Waste processing facilities were set up only at Jawaharnagar T&D facility. Besides, 14 DRCCs were set up for segregation of dry waste for sorting of recyclable materials (Para 4.1.2 refers).	Suitable sites were identified for setting up of waste processing facilities in the existing dumpsites for (i) Wet waste processing by composting in four ULBs <sup>62</sup> (Para 5.2.1, Table-5.2 refers) and (ii) dry waste segregation through Dry Resource Collection Centres (DRCCs) established and functioning in nine ULBs <sup>63</sup> (Para 4.1.2 refers).
2.	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under five lakh population and for	6 months (by March 2019)	Sanitary landfill site exists only at Jawaharnagar T&D facility. However, it was seen that MSW from other nearby ULBs with less than 5 lakh population were	No identification of suitable sites was made for setting up common regional sanitary landfill facilities for suitable clusters of local authorities in the 14 test-checked ULBs. Audit observed

<sup>59</sup> The Board would review and advice State Government on measures for expeditious and appropriate implementation of the SWM Rules, 2016

<sup>60</sup> G.O. Rt.No.447 dated 26 July 2017 of MA&UD Department

<sup>61</sup> G.O. Rt.No.808 dated 24 September 2018 of MA&UD Department

<sup>62</sup> Kothagudem, Mahabubnagar, Mancherial and Zaheerabad

<sup>63</sup> Kalwakurthy, Khammam, Khanapur, Kothagudem, Mahabubnagar, Mancherial, Nagaram, Peerzadiguda and Zaheerabad

Sl. No	Activity	Timelines for implementation from date of notification of the policy	GHMC	14 test-checked other ULBs
	setting up common regional sanitary landfill facilities or stand-alone sanitary landfill facilities by all local authorities having a population of five lakh or more.		also dumped at Jawaharnagar T & D facility as permitted by GHMC. ( <i>Para 3.5 refers</i> ).	that the MSW was dumped in the existing respective dumpsites of these ULBs.
3.	Acquisition of suitable sites for setting up Solid Waste processing facility and sanitary landfill facilities.	6 months (by March 2019)	Sanitary landfill site exists only at Jawaharnagar T&D facility. GHMC stated that one additional site at Pyaranagar had been identified ( <i>Para 5.2.4 refers</i> ).	Acquisition of suitable sites has not been done by any of the test-checked ULBs and Solid Waste processing facilities were set up in the existing dumpsite as stated in SI.No.1 above. MSW dumped in open dumpsites.
4.	Enforcing waste generators to practice segregation of biodegradable, recyclable, combustible, sanitary waste domestic hazardous and inert Solid Wastes at source.	6 months (by March 2019)	No such enforcement observed in audit.	No such enforcement observed in audit.
5.	Ensure door to door collection of segregated waste of households and its transportation in covered vehicles to processing or disposal facilities.	6 months (by March 2019)	Door-to-Door collection of waste was done. Segregation of waste done only in respect of 63 per cent households as per TSPCB report. MSW was transported in covered vehicles by the Concessionaire.	Door-to-Door collection of waste was done. However, there were instances of non-coverage in door-to-door collection of MSW in three ULBs (Bollaram, Wardhannapet and Yellareddy) ( <i>Para no.4.2.1 refers</i> ). Instances of transportation of Solid Waste to the dumpsite in vehicles without cover were also noticed in five ULBs (Khammam, Kothagudem, Mahabubnagar, Mancherial and Zaheerabad) ( <i>Para 4.3.1 refers</i> )
6.	Ensure separate storage, collection and transportation of construction and demolition wastes.	6 months (by March 2019)	Ensured by the Concessionaire for C&D waste ( <i>Para 6.3 refers</i> ).	Not ensured ( <i>Para 6.3 refers</i> ).
7.	Setting up Solid Waste processing facilities by all local bodies having one lakh or more population.	By 2022	Solid Waste processing facilities set up at Jawaharnagar T&D facility ( <i>Para 5.1.2 and Para 5.4/Box.No.1 refer</i> ).	Khammam and Mahabubnagar ULBs have population above one lakh each. Composting facility was set up inside the dumpsite in Mahabubnagar ULB and in operation.
8.	Setting up Solid Waste processing facilities by local bodies and towns below one lakh population as per Census 2011.	By 2022	Not applicable as population above one lakh.	Composting facility for Solid Waste processing was set up only in three ULBs <sup>64</sup> out of 12 ULBs whose population is below one lakh. In order to facilitate segregation, sorting and recovery of recyclables from MSW at dumpsites, Dry Resource Collection Centres (DRCCs) were established in ten ULBs, except Chandur and Wardhannapet and in one ULB-Haliya, construction of DRCC was under progress. Audit observed during JPV of dumpsite in Yellareddy ULB that DRCC was not put to use ( <i>Para 4.1.2 refers</i> ).

<sup>64</sup> Kothagudem, Mancherial and Zaheerabad

Sl. No	Activity	Timelines for implementation from date of notification of the policy	GHMC	14 test-checked other ULBs
9.	Setting up common or stand-alone sanitary landfills by or for all local bodies having 5 lakh or more population for the disposal of only such residual wastes from the processing facilities as well as untreatable inert wastes as permitted under the SWM Rules, 2016.	By 2022	Set up only at Jawaharnagar T&D facility for GHMC area.	Not applicable to the ULBs, as the population in each of these ULBs is less than 5 lakh.
10.	Setting up common or regional sanitary landfills by all local bodies and census towns under 5 lakh population for the disposal of permitted waste under the rules.	By 2022	Not applicable as the GHMC population is above 5 lakh.	Not set up in the 14 test-checked other ULBs.
11.	Bioremediation <sup>65</sup> or capping of old and abandoned dumpsites.	By 2022	Jawaharnagar dumpsite was capped. Fathullaguda dumpsite was reclaimed and used for C&D waste processing plant. Reclamation of Gandhamguda dumpsite was not completed due to title disputes. Shamshiguda dumpsite was partly reclaimed.	Old and or abandoned dumpsites without capping were noticed during JPV in Kalwakurthy, Khammam and Kothagudem.

### 2.1.2 Issues to be addressed in the State Policy

The State policy, with reference to provisions mandated in the MSWM Manual, 2016 and SWM Rules, 2016, had not provided for definite action plans and methods on the following aspects for implementation by the ULBs:

#### (A) SWM aspects for which action plans and suggestive methods were not provided in the State Policy

- i. Assessment of MSW in ULBs and reliable quantification of MSW generated (*Para 2.6 refers*).
- ii. Allotment of suitable lands for setting up processing & disposal facilities for MSW in ULBs (*Para 5.3.1 refers*).
- iii. Achievement of 100 per cent SLBs with reference to household coverage, efficiency of collection and segregation (*Para 2.7.1 refers*).
- iv. Solid Waste reduction in ULBs by adopting the 3R (reduce, reuse, and recycle).
- v. Timelines for ULBs for Information, Education and Communication (IEC) activities to promote waste prevention & waste minimisation through reduction, reuse and recycling (*Paras 2.2 and 7.10 refer*).

<sup>65</sup> Bioremediation is a biotechnical process, which abates or cleans up contamination. It is a type of waste management technique which involves the use of organisms to remove or utilise the pollutants from a polluted area

- vi. Contingency plans for SWM, to tide over situations of non-performance of processing/treatment/disposal facilities and unforeseen situations like strike by municipal workers involved in SWM and natural disasters (earthquakes, floods, fire, etc.) (Para 2.4 refers).

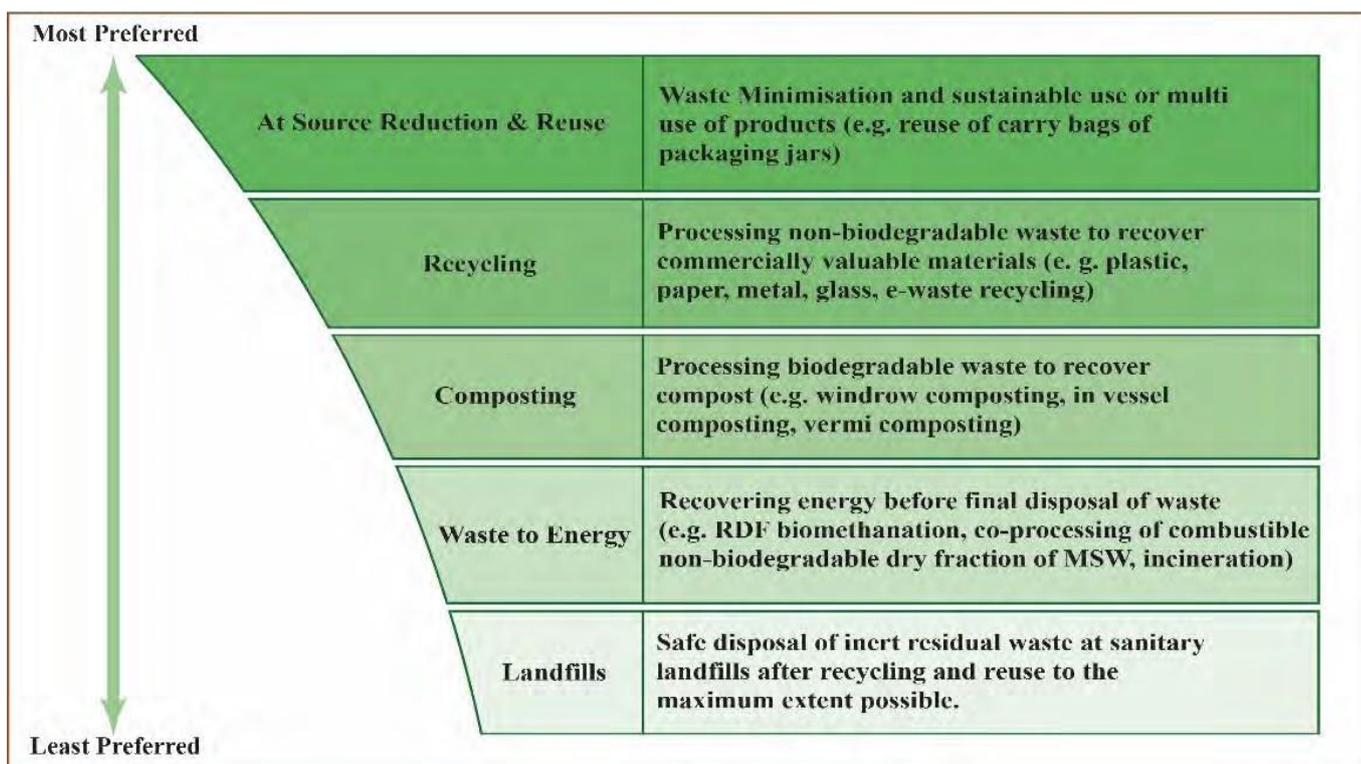
**(B) Human resources issues for SWM not addressed**

- i. Setting out definite roles and responsibilities for TSPCB regarding monitoring and evaluation of SWM activities in the State and for the personnel in ULBs involved in SWM (Paras 2.8 and 7.2 refer).
- ii. Guidelines for involvement of and social inclusion of waste pickers/ rag pickers of informal sector in SWM (Para 4.2.4 refers).

**2.2 Strategy for implementation of 3R approach**

Municipal Solid Waste Management Manual, 2016 (Section 2.1) (Part-II) prescribes a step-wise approach in the order of environmental priority for different waste management options with prevention being the most preferred option and disposal the least favoured. It is closely linked to the 3R (reduce, reuse, and recycle)<sup>66</sup> approach, which helps to reduce the quantity of waste, the cost associated with its handling, and its environmental impacts. The Integrated Solid Waste Management (ISWM) hierarchy of waste management prioritises waste minimisation (reduction at source and reuse) as the most preferred waste management strategy (**Chart-2.1**).

**Chart-2.1: Integrated Solid Waste Management System Hierarchy**



Source: MSWM Manual, 2016

<sup>66</sup> 3R: **Reduce**-to avoid unnecessary waste generation, **Reuse**-to use again, and **Recycle**-to convert unwanted things into useful and marketable recycled products

Although the State had given thrust to 3R (reduce, reuse, and recycle) approach in their policy document (Para 6.3), effective steps to achieve this by the ULBs were not taken (*Para 2.1.2 refers*).

One of the State policy objectives (Para 5) was to restrict the quantity of Solid Waste reaching to the secured landfill to maximum of 20 *per cent* generated, by encouraging segregation and resource recycle/recovery.

**In GHMC:** It was observed that the most preferred method of waste minimisation by source reduction and reuse as per 3R approach was not done. However, recycling of plastic waste, composting of wet waste and Waste to Energy (WtE) was done in GHMC at Jawaharnagar T&D facility (*Para 5.4 refers* and **Box No.1**).

In GHMC more than 80 *per cent* of MSW was processed (*Para 5.1.1 refers* and *Table-5.1*) and the percentage of residual waste landfilled out of generated & collected waste was less than 20 *per cent* (*Para 5.3 refers* and *Table-5.4*).

Thus, the State Policy objective of restricting the quantity of Solid Waste reaching the secured landfill to maximum of 20 *per cent* of waste generated was achieved only in GHMC.

**In test-checked other 14 ULBs:** The details of MSW generated, collected, segregated/processed and disposed in dumpsite in the test-checked other 14 ULBs during the years 2017-22 are given in **Appendix-2.1** along with JPV observations on segregation & processing facilities existing in the dumpsites. Audit observed that against the waste management priorities prescribed in **Chart-2.1**, composting and dry waste segregation for recovery of recyclables was only being done in few of the ULBs as discussed below.

Audit analysis of the data furnished (*Appendix-2.1 refers*) revealed the following:

- a. Despite having Dry Resource Collection Centres (DRCCs)<sup>67</sup> for segregation, sorting and recovery of recyclables from MSW (*Para 4.1.2 refers*) and composting facilities for processing of MSW (*Para 5.2.1 refers*), two ULBs<sup>68</sup> reported percentage of unprocessed MSW dumped in dumpsite was more than 70 *per cent*. This indicated ineffective operation and under utilisation of DRCCs and composting facilities for waste processing.
- b. Despite having no DRCCs and composting facilities four ULBs<sup>69</sup> reported unprocessed MSW disposed as less than 21 *per cent*, i.e., MSW processed/segregated was more than 80 *per cent*. This indicated that data given by these ULBs do not seem reliable and needs to be reconciled.
- c. Two ULBs<sup>70</sup> have only DRCCs and no composting facilities for processing. However, from the data given by the ULBs, it is seen that the percentage of unprocessed MSW dumped in dumpsite was in the range of 21 to 39 *per cent* which means processing of

<sup>67</sup> DRCCs are established to facilitate segregation, sorting and recovery of recyclables from various components of MSW at dumpsites

<sup>68</sup> Mahabubnagar and Zaheerabad

<sup>69</sup> Chandur, Haliya, Wardhannapet and Yellareddy

<sup>70</sup> Kalwakurthy and Khanapur

MSW was in the range of 61 to 79 *per cent*. This statement given by the ULBs also seems unrealistic in the absence of these facilities.

- d. In Nagaram and Peerzadiguda ULBs, the collected MSW was being transported to Jawaharnagar T&D facility for processing (*Table-5.2, Para 5.2.1 refers*) and only DRCCs exists in these two ULBs. However, percentage of disposed unprocessed MSW to collected MSW in these two ULBs was furnished as in range of 40 to 51 *per cent*.

This indicated segregation, sorting and recovery of recyclables from the entire dry waste was in the range of 49 to 60 *per cent* out of total collected MSW, before transportation of the remaining MSW to Jawaharnagar T&D facility. This data seems unrealistic for the same reasons as stated in Sl.No.(c) above and considering the fact that processing of MSW was being done at Jawaharnagar T&D facility.

Further, other waste processing facilities (Bio-methanation, WtE Plants, Biogas and Plastic Recycling units) were not established in all the test-checked other 14 ULBs.

The overall percentage of unprocessed MSW dumped to dumpsite was more than 60 *per cent* (*Appendix-2.1 refers*) and hence the objective of restricting the quantity of Solid Waste reaching to the secured landfill/dumpsite to maximum of 20 *per cent*, as envisaged in the State policy document was not achieved. Thus, waste management in the test-checked other 14 ULBs was not effectively carried out.

### 2.3 Municipal Solid Waste Management Plan

Sections 1.4.5 and 1.4.6 of MSWM Manual, 2016 (Part-II) emphasise the need for ULBs to prepare a detailed SWM plan, with short-term (5 years) and long-term (20-25 years) actions. The short-term plan should lead to the achievement of the long-term plan. Each short-term plan should be reviewed every 2-3 years, to ensure higher success in implementing all plan activities. The short-term plan should cover aspects of institutional strengthening, community mobilisation, waste minimisation initiatives, waste collection and transportation, treatment and disposal, and other policy changes as may be deemed necessary. The financial outlay required for each action plan should be elaborated, and sources of finance ascertained in the planning phase. The MSWM Plan encompasses the following:

- i. institutional strengthening;
- ii. human resources development;
- iii. technical capacity building;
- iv. financial capacity and arrangements {Public Private Partnership framework};
- v. community participation;
- vi. legal framework and mechanism for enforcement; and
- vii. public grievance or complaint redressal

Further Rule 15(a) of SWM Rules, 2016, stipulates that the local authorities shall prepare a Solid Waste management plan as per State Policy and Strategy on Solid Waste management within six months from the date of notification of the State Policy and Strategy and submit a copy to respective departments of State Government.

Greater Hyderabad Municipal Corporation has been implementing the Integrated MSW Management (IMSWM) through the Concessionaire with Concession Agreement (CA) for a period of 25 years (*Para 2.6.1 refers*) and also based on the DPR prepared for the IMSWM. However, GHMC has not revisited the CA for the period of 25 years in consonance with MSWM Manual, 2016.

The State Government replied (September 2023) that the Collection & Transportation (C&T), Treatment and Disposal (T&D) and Operation & Maintenance (O&M) plans prepared in consonance with MSWM Manual, 2016 are considered as Municipal Solid Waste Management Plan.

The reply was contrary to the fact that the CA for implementation of IMSWM as per the applicable laws, which shall mean and include rules, regulations which may be brought into force and effect after the CA date (February 2009). Hence, the provisions of MSWM Manual, 2016 and SWM Rules, 2016 need to be adopted accordingly. However, the IMSWM implemented through the Concessionaire was based on the Detailed Project Report prepared in 2012 (*Para 2.6.1 refers*) and was not revisited thereafter in accordance with MSWM Manual, 2016.

Audit observed that in the other test-checked 14 ULBs, MSWM Plan encompassing the activities (Sl.Nos. i to vii) as mandated in the MSWM Manual, 2016 was not prepared. There was also no short-term plan (5 years) prepared in the test-checked 14 ULBs, which deprived them of the opportunity of adopting a systematic approach to SWM.

## 2.4 Preparation of contingency plans

Municipal Solid Waste Management Manual, 2016 (Section 5.4) (Part-II) stipulates that ULBs should prepare contingency plans for appropriate storage of waste, to tide over situations of any unforeseen events.

Audit observed that contingency plans were not prepared in all the test-checked ULBs. The requirement of a contingency plan was neither envisaged in the State Policy nor addressed by the test-checked ULBs.

## 2.5 Involvement of all stakeholders in planning

Manual on MSWM, 2016 (Sections 1.4.4, 1.4.4.1.1 and 1.4.4.1.2) (Part-II) provided for constitution of a core team or advisory team (internal stakeholders<sup>71</sup>) involving all departments concerned with SWM services for developing the MSWM plan. It also included involvement of the external stakeholders (comprising households, informal sector, NGOs, CBOs, SHGs, women's groups, secondary school and college students *etc.*) in MSWM planning and implementation.

<sup>71</sup> (i) Commissioner or chief executive of the ULB, (ii) Head of the SWM department, (iii) Environmental engineer in the SWM department, (iv) Head of the Town Planning Department, (v) Heads of the water supply, public health or sanitation, and sewerage departments, (vi) Head of the accounts department and (vii) Ward level officials in the SWM department

There was no MSWM plan in all the test-checked ULBs encompassing the activities (Sl.Nos. i to vii) as mandated in the MSWM Manual, 2016 (*Para 2.3 refers*). Audit also noticed that core team or advisory team involving internal/external stakeholders was not formed in any of the test-checked ULBs.

The State Government replied (November 2023) that in eight ULBs<sup>72</sup> a core team or an advisory team was set up with immediate effect. It was also stated that meetings would be conducted at regular intervals and suggestions from the core team would be implemented for SWM action plan in future.

## 2.6 Generation and Assessment of Solid Waste

A reliable assessment of the different kinds of waste generated in the limits of the ULB is essential for planning and effective implementation of SWM. Section 1.4.3.3 of MSWM Manual, 2016 (Part-II) stipulates that each ULB should assess the quantity and composition of waste generated to plan for and design effective MSWM systems. The quantity and composition of Municipal Solid Waste (MSW) generated in the ULB determines the collection, processing and disposal options that could be adopted.

The details of MSW generated by all ULBs in the State, GHMC and the test-checked other 14 ULBs during 2017-18 to 2021-22 are given in **Table-2.2**. More than 50 per cent of MSW in the State was generated in GHMC.

**Table-2.2: MSW generated by all ULBs in the State, GHMC and the test-checked other 14 ULBs during 2017-18 to 2021-22**

(Figures in TPD)

Year	State	GHMC	Test-checked other 14 ULBs
2017-18	7,871	4,864	337
2018-19	8,497	5,298	382
2019-20	9,285	5,799	437
2020-21	9,965	5,668	494
2021-22	11,057	6,166	538
<b>Total</b>	<b>46,675</b>	<b>27,795</b>	<b>2,188</b>

Source: Annual Reports on SWM submitted by TSPCB to CPCB, information furnished by GHMC and test-checked other 14 ULBs

Section 1.4.3.3.1 of MSWM Manual, 2016 (Part-II) stipulates that for the purpose of long-term planning, average amount of waste disposed by a specific class of generators may be estimated only by averaging data from several samples. These samples are to be collected continuously for a period of seven days at multiple representative locations within the jurisdiction of ULB, in each of three main seasons *viz.*, summer, winter and rainy seasons. Waste should be aggregated over a seven-day period, weighed and averaged. These quantities could then be extrapolated to entire ULB and per capita generation assessed.

<sup>72</sup> Bollaram, Chandur, Haliya, Kalwakurthy, Mahabubnagar, Mancherial, Nagaram and Peerzadiguda

The methodology of waste generation estimation prescribed by MoUD, GoI in the Handbook of SLBs<sup>73</sup> mandates the conduct of survey for MSW assessment, which when compared to per capita based MSW assessment, should have the highest level of reliability.

### 2.6.1 Assessment of Solid Waste generated in Greater Hyderabad Municipal Corporation

The Greater Hyderabad Municipal Corporation took up implementation of an IMSWM Project in Hyderabad through Public Private Partnership (PPP) mode and entered (February 2009) into a Concession Agreement (CA) for a concession period of 25 years with Ramky Enviro Engineers Limited, Hyderabad<sup>74</sup>, subsequently renamed (February 2022) as Re Sustainability Limited (the Concessionaire). The IMSWM Project was being implemented by Hyderabad Integrated Municipal Solid Waste Limited (HIMSWL)<sup>75</sup> (wholly owned subsidiary of the Concessionaire) based on the DPR prepared for this purpose in the year 2012.

The Greater Hyderabad Municipal Corporation made MSW assessment in the DPR, considering the estimated MSW generated in the city based on detailed survey at the time of preparation of the DPR as 4,400 TPD for an estimated population of 83,89,068 for the base year 2011, which works out to 524.5 gm/capita/day. Accordingly, MSW assessment for the years from 2011 to 2041 was done in the DPR (Para 1.11, Table-1.9 of the DPR) on per capita based method, assuming that per capita waste generation (gm/day) would increase annually by 1.5 *per cent* as detailed in **Appendix-2.2**.

It could be seen from **Appendix-2.2** that the projected MSW generation was 6,263 TPD, *i.e.*, 22,85,995 MT for the year 2021. However, as per the data furnished to Audit by GHMC, the actual total waste generated and received at Jawaharnagar T&D facility for the year 2021-22 was 24,23,637 MT, which was more than the projections made in the DPR (6 *per cent*). Though the DPR was prepared for GHMC area, the other nearby ULBs around GHMC limits were also permitted later to transport their generated waste to the Jawaharnagar Treatment & Disposal (T&D) Facility, thereby increasing the load on the existing T&D facility and this factor was not considered at the time of preparation of DPR for MSW assessment.

The Concession Agreement includes that for implementation of IMSWM, the applicable laws shall mean and include rules, regulations which may be brought into force and effect after the CA date (February 2009). Hence, the provisions of MSWM Manual, 2016 and SWM Rules, 2016 need to be adopted accordingly.

<sup>73</sup> Waste generation estimates based on quarterly survey/sample of statistically significant and representative number of households and establishments. Seasonal variation in waste quantity generation is captured in these estimates. Waste collection is based on actual weighment of waste on a weighbridge at the disposal site (which is aggregate of waste measured at composting yard, sanitary landfill site, and waste taken out for recycling / reuse after it has been collected)

<sup>74</sup> G.O.Ms.No.136 dated 19 February 2009 of MA&UD (J) Department, wherein it was mentioned that out of two bids received, the L1 bid of M/s Ramky Enviro Engineers Limited, Hyderabad was selected

<sup>75</sup> The HIMSWL, being the Special Purpose Company of M/s REEL shall undertake and perform the obligations and exercise the rights of the Concessionaire under the CA. M/s REEL undertakes to hold itself principally responsible for all the duties and obligations under the CA throughout the Concession period though the same is assigned in favour of HIMSWL

Audit observed that no survey was done as mandated in MoUD, GoI in Handbook of SLBs after preparation of the DPR in 2012 and MSW re-assessment was not undertaken in accordance with MSWM Manual, 2016 for long-term planning.

The State Government replied (September 2023) that since 100 *per cent* of waste was being collected in GHMC, the assessment of trend of increase in waste was observed annually and accordingly the plant capacity was increased and hence no survey was initiated.

The reply was not in consonance with the fact that increase in plant capacity for T&D<sup>76</sup> was done to process the corresponding increase in received solid waste. However, reliable assessment of solid waste generated was not done, as mandated in MoUD, GoI in Handbook of SLBs, after preparation of the DPR in 2012.

### 2.6.2 Assessment of Solid Waste generated in test-checked other 14 Urban Local Bodies

The details of population projections, MSW assessed, generated during audit period (2017-18 to 2021-22) in the 14 test-checked ULBs are given in **Appendix-2.3**. Audit observed the following from the analysis of data/information furnished by the ULBs on population projections, MSW assessed and generated:

- a. Eight ULBs<sup>77</sup> had mentioned same quantity figures for both MSW assessed and actually generated for the period 2017-18 to 2021-22, which indicated that assessment of MSW was not done in these ULBs, as generated figures were shown as assessed figures.
- b. The Municipal Solid Waste assessment and verification was stated to have been done by Assistant Engineer/Environmental Engineer/Sanitary Inspector. However, documentary evidence in support of the MSW assessment done showing the methodology adopted for assessment was not produced to Audit by the test-checked other 14 ULBs. Hence, Audit could not verify the correctness or otherwise of the assessment of MSW done and methodology followed by the test-checked other 14 ULBs.
- c. During JPV of the dumpsites in the test-checked other 14 ULBs, it was noticed that there were no weighbridges in 12 ULBs<sup>78</sup> (*Para 5.3.3 refers* and also *Chart-5.1*) to quantify the Solid Waste collected and transported to dumpsites. Hence, the MSW generated figures furnished by these 12 ULBs were not reliable in the absence of weighbridges to quantify the collected and transported MSW.
- d. Though the annual population figures remained same, corresponding MSW assessed projections showed random annual incremental increase in four ULBs<sup>79</sup>, which indicated that MSW assessment was done without considering corresponding population growth annually and hence the MSW assessment done was defective.

<sup>76</sup> From 2,000 TPD in the year 2012 to 8,000 TPD in the year 2022

<sup>77</sup> Kalwakurthy, Khanapur, Kothagudem, Mahabubnagar, Nagaram, Peerzadiguda, Yellareddy and Zaheerabad

<sup>78</sup> Bollaram, Chandur, Haliya, Kalwakurthy, Khammam, Khanapur, Kothagudem, Mancherial, Nagaram, Wardhannapet, Yellareddy and Zaheerabad

<sup>79</sup> Kalwakurthy, Peerzadiguda, Wardhannapet and Yellareddy

- e. Neither there was an annual incremental increase in population nor corresponding MSW assessed projections. As a result, same MSW assessed figures were shown every year against the population by three ULBs<sup>80</sup>, which indicated that MSW assessment was not done by these ULBs.

Section 1.4.5.1.2 of MSWM Manual, 2016 (Part-II) stipulates a few methods for population projections such as, Arithmetical increase, Geometrical increase, Incremental increase *etc.*, to be adopted. To illustrate, Audit estimated<sup>81</sup> the population projections and corresponding MSW assessment for one ULB-Mahabubnagar, as per the suggested percentages in Section 1.4.3.3 of the MSWM Manual, 2016 and a comparison made with the figures furnished to Audit are detailed in **Table-2.3**

**Table-2.3: Comparison of population projections and MSW assessed figures furnished by Mahabubnagar ULB and as estimated by Audit for the years 2017-18 to 2021-22**

(Figures in MT/Year)

Year	Mahabubnagar ULB projections			Audit projections				
	Population adopted by ULB	Percentage increase in population over previous year	MSW assessed	Population worked out by Audit	Percentage increase in population over previous year	Per capita MSW generation in gm/day as per Audit	Percentage increase in per capita MSW over previous year	MSW assessed
	1	2	3	4	5	6	7	8= (col 4*col 6*365/10 <sup>6</sup> )
2017-18	2,17,143	-	28,080	2,66,924	-	378	-	36,827
2018-19	2,20,513	1.55	28,080	2,76,267	3.5	383	1.3	38,620
2019-20	2,23,481	1.35	29,520	2,85,936	3.5	388	1.3	40,494
2020-21	2,40,564	7.6	35,280	2,95,944	3.5	393	1.3	42,451
2021-22	2,54,514	5.8	38,160	3,06,302	3.5	398	1.3	44,496

Source: Information provided by Mahabubnagar ULB

Mahabubnagar ULB has taken 2011 census population figure of 2,17,143 as the base figure for 2017-18, which was an incorrect population projection methodology. Besides, the difference between the MSW assessed figures as per Audit projections and the Mahabubnagar ULB projections evidently shows that no proper methodology was followed by Mahabubnagar ULB for population projections and corresponding MSW assessment. Similarly, test-checked other 13 ULBs also did not make population projections correctly leading to incorrect assessment of MSW.

Thus, all the test-checked ULBs including GHMC neither made MSW assessment as mandated in the MSWM Manual, 2016 for long-term planning nor conducted survey for assessment of Solid Waste adhering to the methodology prescribed by MoUD, GoI in Handbook of SLBs.

<sup>80</sup> Kothagudem, Mancherial and Zaheerabad

<sup>81</sup> Taking base year (2011 census) population as 2,17,143 with annual incremental growth rate of 3.5 *per cent* and annual incremental increase of MSW as 1.3 *per cent* (Section 1.4.3.3 of MSWM Manual, 2016). For MSW assessment for the base population year 2011 census (2,17,143), the rate was adopted as 350 gm/capita/day in cities with a population between 2,00,000 and 5,00,000 as per Section 1.4.3.3 of MSWM Manual, 2016, which works out to 27,740 MT/Year for 2011-12

## 2.7 Service Level Benchmarks

Ministry of Urban Development, GoI has set SLBs at the national level for service provision in four key sectors—water supply, sewerage, SWM and storm water management. Monitoring performance and improvements are envisaged as the goal of the Service Level benchmarking. Benchmarking should be used as a tool for undertaking objective performance analysis by ULBs to improve their activities. MoUD, GoI defined a common minimum framework for monitoring and reporting on performance indicators, of which eight performance indicators pertained to SWM as detailed in **Appendix-2.4**.

Audit observations on SLB achievements for 2021-22 as declared by the test-checked ULBs are discussed in the succeeding paragraphs.

### 2.7.1 Targets and achievement in test-checked Urban Local Bodies

Service Level Benchmarks declarations (2021-22) furnished by GHMC in respect of these performance indicators are shown in **Table-2.4**.

**Table-2.4: Service Level Benchmarks achievement by GHMC (2021-22)**

Sl. No	Performance indicator	Bench mark (in per cent)	Achievement (in per cent)
1.	Household level coverage of SWM services	100	100
2.	Efficiency of collection of municipal Solid Waste	100	100
3.	Extent of segregation of municipal Solid Waste	100	63
4.	Extent of municipal Solid Waste recovered	80	85
5.	Extent of scientific disposal of municipal Solid Waste	100	100
6.	Extent of cost recovery in SWM services	100	80
7.	Efficiency in redressal of customer complaints	80	85
8.	Efficiency in collection of SWM user charges	90	80

Source: Information furnished by GHMC

**In GHMC:** Audit analysed the SLB declarations made by GHMC with the respective data/information to the extent furnished and it was observed that-

**a.** Municipal Solid Waste from households was transferred to primary collection vehicles by the waste collectors/waste pickers in a mixed manner and was being transported to intermediate storage facilities as discussed in *Paragraph 4.1.1.1*. GHMC also confirmed that though source segregation was done to a certain extent, the MSW was being transported in mixed manner to Jawaharnagar T&D facility and there was practically no segregation of MSW at intermediate storage facilities. Hence, the SLB declaration of 63 per cent was not factually correct.

**b.** Though GHMC stated that efficiency in redressal of customer complaints was 85 per cent, Audit observed from the year-wise data on redressal of complaints received during 2017-22 that redressal of complaints was done within a minimum time of 48 hours and not within 24 hours as mandated.

Further, out of 1,41,649 complaints<sup>82</sup> received in GHMC during 2017-22, 1,35,832 were resolved (96 *per cent*) leaving 5,817 complaints unresolved as on 23 May 2023. Out of these 5,817 pending complaints, 3,754 (64 *per cent*) of the unresolved complaints pertain to more than two years.

The State Government replied (September 2023) that the pending complaints pertain to other line departments in GHMC like street lighting, drainage issues, *etc.*, and water supply complaints related to HMWSSB wrongly (unknowingly) registered under health and sanitation.

The reply was contradictory to the fact that the 1,41,649 complaints received in GHMC as per the data furnished to Audit pertain to SWM services only including balance unresolved complaints. Further, documentary evidence for the number of complaints resolved within mandatory 24 hours were not furnished to Audit to verify the SLB achievement declaration of 85 *per cent* (*Para 7.7 refers*).

c. In respect of efficiency in collection of user charges, the user charges are collected from the waste generators (households) by the waste collectors operating Swachh Auto Tippers (SATs) (owned and operated by them including maintenance) and no revenues yield to GHMC. User charges collected from Bulk Waste Generators are credited to the General Fund account.

The Service Level Benchmark indicator for efficiency in collection of user charges is measured based on current year revenues<sup>83</sup> collected against total operating revenues for the corresponding period (*Appendix-2.4 refers*). However, current year (2021-22) revenues data was not furnished to Audit and hence the SLB declaration on efficiency in collection of user charges made by GHMC could not be verified in audit (*Para 3.3 refers*).

**In test-checked other 14 ULBs:** Two ULBs (Kothagudem and Wardhannapet) did not furnish the SLBs declaration information to Audit. An abstract of SLBs declarations (2021-22) furnished by the remaining 12 test-checked ULBs<sup>84</sup> in respect of these performance indicators have been compiled and shown in **Table-2.5**. Detailed SLB achievement declarations for the year 2021-22 made by each of the test-checked other 12 ULBs against performance indicators are given in **Appendix-2.5**.

**Table-2.5: Service Level Benchmarks achievement by test-checked other 12 ULBs (2021-22)**

Sl. No	Particular of SLB declaration in test-checked ULBs	Number of ULBs (Achievements range in percentage)				
		Zero	1 to 20	21 to 50	51 to 80	81 to 100
1.	Household level coverage of SWM services	0	0	0	0	12
2.	Efficiency of collection of municipal Solid Waste	0	0	0	0	12
3.	Extent of segregation of municipal Solid Waste	0	0	6	5	1

<sup>82</sup> Complaints relating to (i) Segregation of waste not done, (ii) Construction and Demolition waste lifting, (iii) Street sweeping not done, (iv) Garbage dumping, (v) Garbage burning and (vi) Garbage nuisance while transporting

<sup>83</sup> Revenues collected for bills raised during the year. This should exclude collection of arrears as inclusion of arrears will skew the performance reflected

<sup>84</sup> Bollaram, Chandur, Haliya, Kalwakurthy, Khammam, Khanapur, Mahabubnagar, Mancherial, Nagaram, Peerzadiguda, Yellareddy and Zaheerabad

Sl. No	Particular of SLB declaration in test-checked ULBs	Number of ULBs (Achievements range in percentage)				
		Zero	1 to 20	21 to 50	51 to 80	81 to 100
4.	Extent of municipal Solid Waste recovered	1	0	1	9	1
5.	Extent of scientific disposal of municipal Solid Waste	10	0	0	0	2
6.	Extent of cost recovery in SWM services	9	0	2	1	0
7.	Efficiency in redressal of customer complaints	1	0	0	7	4
8.	Efficiency in collection of SWM user charges	5	0	0	1	6

Source: Information provided by test-checked other 12 ULBs

Audit observed that there was no scientific disposal of Solid Waste, as landfill sites were not identified in the test-checked ULBs and hence the achievements were significantly below the benchmark. Audit analysis of the SLBs declarations (2021-22) made by the test-checked 12 ULBs (*Appendix-2.5 refers*) with reference to MSW generated, collected, segregated/processed data furnished for the year 2021-22 (**Appendix-2.6** and also *Para 4.1.2 refers*) is as follows:

- i. The Service Level Benchmark declaration by Bollaram ULB of more than 80 *per cent* achievement in coverage of SWM services (**Sl.No.1 of Table-2.5**) was contradictory to the fact that actual coverage of Hotels, Restaurants, Shops, *etc.*, in door-to-door collection of MSW in 2021-22 was only 14 *per cent* (*Para 4.2.1 refers*).

The State Government replied (November 2023) that action has been taken for door-to-door collection of MSW covering Hotels, Restaurants, Shops, *etc.*

- ii. In Zaheerabad ULB, though the percentage of MSW segregated/processed (extent of MSW recovered) was less than one *per cent* as per the data furnished to Audit, the percentage of SLB achievement against extent of MSW recovered (**Sl.No.4 of Table-2.5**) was declared between 81 to 100 *per cent*, which was contradictory.

Similarly, in three other ULBs<sup>85</sup>, though the percentage of MSW segregated/processed was less than 50 *per cent* (*Appendix-2.6 refers*), the corresponding SLB declarations made was between 51 to 80 *per cent*, which was also contradictory.

- iii. As of 31 March 2023, scientific disposal of MSW in Sanitary Landfill is taking place only in GHMC at Jawaharnagar T&D facility and was also mentioned in the Annual Report 2021-22 on SWM submitted by TSPCB to CPCB.

Mahabubnagar ULB had declared SLB achievement of more than 80 *per cent* against the indicator 'Extent of scientific disposal of municipal Solid Waste' (**Sl.No.5 of Table-2.5**). However, the JPV of dumpsite of Mahabubnagar ULB confirmed that there was no Sanitary Landfill site (*Para 5.3.1 refers and also Table-5.6*).

The State Government accepted (November 2023) that there was no Sanitary Landfill in Mahabubnagar ULB and the data provided to Audit was incorrect.

<sup>85</sup> Bollaram, Khammam and Mahabubnagar

In Nagaram ULB, the transported MSW is temporarily stored in the dumpsite (*Para 5.3.3 refers and also Table-5.6*) and from there it was being transported by the Concessionaire for final disposal at Jawaharnagar T&D facility under the jurisdiction of GHMC for scientific disposal of MSW in Sanitary Landfill. Hence, SLB declaration of more than 80 *per cent* (*Appendix-2.5 refers*) by Nagaram ULB, was not factually correct.

- iv. Audit observed from the details<sup>86</sup> of cost recovery in SWM services for the year 2021-22 furnished by only two ULBs (Bollaram and Mahabubnagar), that the percentage of cost recovery in these two ULBs was 32.94 *per cent* and 7.3 *per cent* respectively. However, SLB declarations of 45 and 46 *per cent* respectively were made by these two ULBs (*Appendix-2.5 refers*) against the indicator, cost recovery in SWM services (**Sl.No.6 of Table-2.5**) which was contradictory.
- v. Seven ULBs<sup>87</sup> made declarations of 51 to 80 *per cent* achievement (*Appendix-2.5 refers*) related to efficiency in redressal of customer complaints against indicator at **Sl.No.7 of Table-2.5**. However, documentary evidence in the form of total number of MSWM related complaints resolved against total number of MSWM complaints received within 24 hours was not produced to Audit. The same was the case with other four ULBs<sup>88</sup>, which made declarations of 81 to 100 *per cent* (*Appendix-2.5 refers*).
- vi. Audit observed from the information on SWM user charges furnished to Audit by the 14 ULBs that they are not recovering the user charges and the ULBs stated that authorised waste collectors are collecting the user charges from the waste generators/households for the MSW collected (*Para 3.3 refers*).

Hence, the SLB declarations of 51 to 80 *per cent* achievement made by one ULB (Mahabubnagar) and 81 to 100 *per cent* achievement (*Appendix-2.5 refers*) made by six ULBs<sup>89</sup> against the indicator ‘Efficiency in collection of SWM user charges’ (**Sl.No.8 of Table-2.5**) was not factually correct.

Thus, the correctness of the SLB achievements declared by the test-checked ULBs could not be verified in audit in the absence of documentary evidence to the extent not produced in support of their claims. Further, Audit analysis/observations above indicate that SLB declarations made by the test-checked other 12 ULBs were not only contradictory but also factually incorrect.

## 2.8 Allocation of responsibility and accountability of Urban Local Bodies

Identification of nodal agencies and implementing bodies, and allocation of responsibility and accountability to these are essential for ensuring smooth and effective compliance with laws and rules. Section 1.4.5.4 of MSWM Manual, 2016 (Part-II) strongly recommends

<sup>86</sup> Bollaram: Annual (2021-22) operating revenue (₹0.45 crore) and operating expenses (₹1.366 crore). Mahabubnagar: Annual (2021-22) operating revenue (₹0.65 crore) and operating expenses (₹8.90 crore). Cost recovery in SWM services in percentage is calculated as  $[\text{Annual operating revenues}/\text{Annual operating expenses}] \times 100$  (As per MoUD, GoI, Handbook on SLB)

<sup>87</sup> Chandur, Haliya, Khammam, Khanapur, Mancherial, Peerzadiguda and Yellareddy

<sup>88</sup> Bollaram, Kalwakurthy, Mahabubnagar and Nagaram

<sup>89</sup> Bollaram, Chandur, Khammam, Mancherial, Nagaram and Peerzadiguda

that ULBs should have an SWM cell or SWM department having staff with technical and managerial skills specific to MSW management. The ULB shall follow their respective State Government norms for staffing the SWM department.

**In GHMC:** Rationalisation of staffing pattern in GHMC was done in the year 2013<sup>90</sup> (prior to bifurcation of the composite State of Andhra Pradesh) and a separate Department for SWM was created. Inadequacy of staff to deal with SWM is discussed in the succeeding paragraph.

**In test-checked other 14 ULBs:** The status of formation of SWM cell and the staff looking after SWM activities in the test-checked other 14 ULBs are given below:

- Bollaram, Haliya, Mancherial, Nagaram and Peerzadiguda ULBs replied that SWM Cell was led by Sanitary Inspectors, with technical and monitoring support from Environmental Engineers and outsourcing agency.
- Chandur ULB stated that one Environmental Engineer and 28 Sanitary Jawans were engaged for SWM activities.
- Kalwakurthy ULB stated that a SWM Cell was set up with one Environmental Engineer.
- Kothagudem ULB stated that a dedicated staff for SWM Cell was set up for looking after SWM activities with one Sanitary Inspector (Incharge), one Environmental Engineer and eight Sanitary Jawans.
- Khammam ULB stated that SWM cell was formed with Sanitary Inspectors and also appointed Environmental Engineer for Technical support, who are doing regular monitoring of SWM activities.
- Mahabubnagar ULB stated that the Sanitation wing looks after SWM with allocated staff<sup>91</sup>.
- Wardhannapet ULB stated that due to lack of staff, SWM cell was not constituted.

Besides, details of staff who were looking after the SWM activities in the remaining three ULBs<sup>92</sup>, in the absence of dedicated SWM cell/department-was not furnished to Audit.

Commissioner and Director of Municipal Administration, Hyderabad stated (October 2022) that Sanitation sections headed by Municipal Health Officer, Deputy Municipal Health Officer/Sanitary Supervisor/Sanitary Inspector are dealing with SWM with Environmental Engineer providing technical and monitoring support.

Audit observed from the statement showing the status (as on January 2023) of overall manpower availability in 141 ULBs furnished by CDMA, Hyderabad that there are no such sanctioned posts of Municipal Health Officer and Deputy Municipal Health Officer. The State Government had not issued orders similar to GHMC in other ULBs, for the creation of separate Department/Cell for SWM with prescribed staffing pattern to exclusively look after SWM activities.

<sup>90</sup> G.O.Ms.No.156 dated 09 April 2013 of MA&UD (A1) Department

<sup>91</sup> Environmental Engineer-01, Sanitary Inspectors-03, Health Assistant-01, Sanitary Jawans-18 and Composting staff-06

<sup>92</sup> Khanapur, Yellareddy and Zaheerabad

### 2.8.1 Human Resources for Solid Waste Management

In 141 ULBs of the State, against 4,389 sanctioned posts in eight categories (as of January 2023), which deal with Sanitation-cum-SWM activities, 2192 personnel were working and there was overall 50 *per cent* vacancy in the posts, as detailed in **Table-2.6**.

**Table-2.6: Sanctioned posts, PIP with vacancy position of posts dealing with Sanitation-cum-SWM activities in 141 ULBs (excluding GHMC)**

Sl. No.	Name of the post	Sanctioned posts	PIP	Vacancy
1.	Environmental Engineer	22	07	15
2.	Health Assistant	144	70	74
3.	Municipal Health Inspector	02	02	0
4.	Public Health Workers	3,768	1,906	1,862
5.	Sanitary inspector	101	59	42
6.	Sanitary Jawan	314	137	177
7.	Sanitary Mastry	25	06	19
8.	Sanitary Supervisor	13	05	08
<b>Total</b>		<b>4,389</b>	<b>2,192</b>	<b>2,197</b>

Source: Information furnished by CDMA

**In GHMC:** A separate Department for SWM was created with the following sanctioned posts against which the PIP as on 31 March 2022 are given in **Table-2.7**.

**Table-2.7: Statement showing the sanctioned posts, persons-in-position and vacant posts in GHMC SWM Department as on 31 March 2022**

Sl. No.	Name of the post	No. of posts sanctioned	Persons-in-position	Vacant posts
1.	Superintending Engineer	1	1	0
2.	Executive Engineers	8	3	5
3.	Deputy Executive Engineers	34	18	16
4.	Asst. Executive Engineers/ Asst. Engineers	36	28	8
5.	Superintendent	1	1	0
6.	Senior Assistant	2	0	2
7.	Junior Assistant	2	0	2
<b>Total</b>		<b>84</b>	<b>51</b>	<b>33</b>

Source: Information provided by GHMC

It could be observed from **Table-2.7** that there were overall 39 *per cent* vacancies in the SWM Department. The vacancy was more than 40 *per cent* in the supervisory cadres of Executive Engineers (EE) and Deputy Executive Engineers (DEE) and there was 100 *per cent* vacancies in the supporting staff cadre of Senior Assistant and Junior Assistant.

The State Government replied (September 2023) that necessary steps would be taken to post one DEE (SWM) to each of the 30 Circles, one EE (SWM) to each of the six Zones and also the supporting staff in Head Office.

**In test-checked other 14 ULBs:** In the test-checked other 14 ULBs, there was no exclusive Department for SWM with separate SS and PIP (*Para 2.8 refers*). The staff of Sanitation Wing looks after both sanitation and SWM activities.

## 2.9 Capacity building

Rule 11(k) of SWM Rules, 2016 stipulate that the Secretary Urban Development Department in the State should arrange for capacity building of local bodies in managing Solid Waste, segregation and transportation or processing of such waste at source. The ULBs as per Rules 15(l) and 15(zc) should-

- Provide training on Solid Waste management to waste-pickers and waste collectors.
- Educate workers including contract workers and supervisors for door-to-door collection of segregated waste and transporting the unmixed waste during primary and secondary transportation to processing or disposal facility.

Besides, Section 1.4.5.5 of MSWM Manual, 2016 (Part-II) mandates that approach to capacity building in MSWM should not only focus on technology but also on different aspects including governance, financing, planning, and improved service delivery. Further, the required training on these different aspects needs to be imparted to the stakeholders viz., (i) Elected Representatives, (ii) Senior Officers, (iii) Collection staff, (iv) Transportation staff, (v) NGOs/CBOs and (vi) Staff at processing plant as detailed in **Appendix-2.7**.

**State Government:** CDMA replied (May 2023) that workshop on Swachh Survekshan<sup>93</sup> for 141 ULBs was arranged for the years 2020 to 2022.

However, the State Government did not arrange for specific capacity building of local bodies staff in managing Solid Waste, segregation and transportation or processing of such waste at source, though mandated in SWM Rules, 2016.

**In GHMC:** GHMC stated that Trainings/Awareness Programmes/ Workshops were conducted during 2017-21 involving Environmental Specialist, Resident Welfare Associations and NGOs. However, details of specific trainings conducted to the stakeholders mentioned above as per provisions of Manual were not furnished to Audit.

The State Government replied (September 2023) that details of training conducted were furnished during audit. However, no specific reply was furnished for non-conduct of training as per the Manual Provisions, as pointed out in audit (**Appendix-2.7**).

**In test-checked other 14 ULBs:** Audit observed that five ULBs<sup>94</sup> had not conducted trainings on SWM during 2017-22. The other nine ULBs<sup>95</sup> had stated that they had conducted trainings on courses related to source segregation, garbage dump, home composting, transportation & processing and waste to compost.

Audit observed that capacity building on governance, finance and planning was not conducted for the stakeholders. Besides, specific training and capacity building activities as mandated (*Appendix-2.7 refers*) in Section 1.4.5.5 of MSWM Manual, 2016 (Part-II) and Rules 15(l) and 15(zc) for the designated stakeholders were not conducted in all the

<sup>93</sup> Swachh Survekshan is an annual ranking exercise taken up by the Ministry of Housing and Urban Affairs (MoH&UA), GoI to assess urban areas of country on their levels of cleanliness and active implementation of Swachhta mission initiatives in a timely & innovative manner

<sup>94</sup> Bollaram, Chandur, Kalwakurthy, Nagaram and Wardhannapet

<sup>95</sup> Haliya, Khammam, Khanapur, Kothagudem, Mahabubnagar, Mancherial, Peerzadiguda, Yellareddy and Zaheerabad

test-checked ULBs. Hence, the capacity building undertaken by the test-checked ULBs when compared to coverage of all the stakeholders prescribed in the Manual for capacity building was found deficient.

The State Government replied (November 2023) that Bollaram, Kalwakurthy and Nagaram ULBs had conducted training on SWM, but documentary evidence was not furnished to Audit. It was also stated that Wardhannapet ULB had not conducted capacity building training on SWM.

## 2.10 Conclusion

The State Policy document on Solid Waste Management formulated by the State Government in September 2018 did not set out definite roles and responsibilities for TSPCB regarding monitoring and evaluation of SWM activities and for personnel in ULBs involved in SWM. Effective methods for Solid Waste reduction in ULBs by adopting the 3R (reduce, reuse and recycle) were not addressed in the State Policy document. The test-checked ULBs had not conducted surveys for MSW assessment during 2017-22, though mandated in the MSWM Manual and SLB Handbook of MoUD, GoI. GHMC adopted per capita estimates for MSW assessment that had a low level of reliability. The per capita estimates based assessment for MSW adopted by the test-checked other 14 ULBs were not reliable either. Though an SWM Department was constituted in GHMC, there were more than 40 *per cent* vacancies in supervisory and supporting staff cadres. SWM Cell/Department was not formed in test-checked other 14 ULBs. All the test-checked ULBs had not prepared long-term and short-term plans for SWM, which deprived the ULBs of the opportunity of adopting a systematic approach to SWM.

## 2.11 Recommendations

- (i) *State Government should set definite roles and responsibilities in the State Policy for TSPCB and for the personnel in ULBs regarding monitoring and evaluation of SWM activities.*
- (ii) *State Government should promote waste minimisation through the adoption of the 3R approach (reduce, reuse, recycle) and should encourage citizens to practice home composting.*
- (iii) *State Government should direct ULBs to conduct surveys at regular intervals for assessment of MSW as per methodology prescribed in the MSWM Manual and SLB Handbook of MoUD, GoI.*
- (iv) *State Government should issue necessary directions to the ULBs for preparation of long-term and short-term plans for a systematic approach to SWM and to plan for required infrastructure.*