

Chapter III

Planning and institutional mechanism

3.1 Entities involved in solid waste management

The framework for administration and management of SWM in India is broadly divided into three tiers - Central, State and Urban Local Bodies (ULBs). Other stakeholders that play a crucial role are households, businesses, industries, informal sector, non-governmental organizations (NGOs), community-based organizations (CBOs), self-help groups (SHGs), *etc.* Involvement of all these stakeholders is necessary at several stages of SWM. **Appendix 3.1** lists out the roles and major responsibilities of stakeholders involved in the process of SWM.

3.2 Generation and assessment of waste

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

The details of MSW generated by all ULBs (except BBMP) in the State for the period from 2013-14 to 2016-17 are given in **Table 3.1**:

Table 3.1: Details of MSW generated by all ULBs (except BBMP)

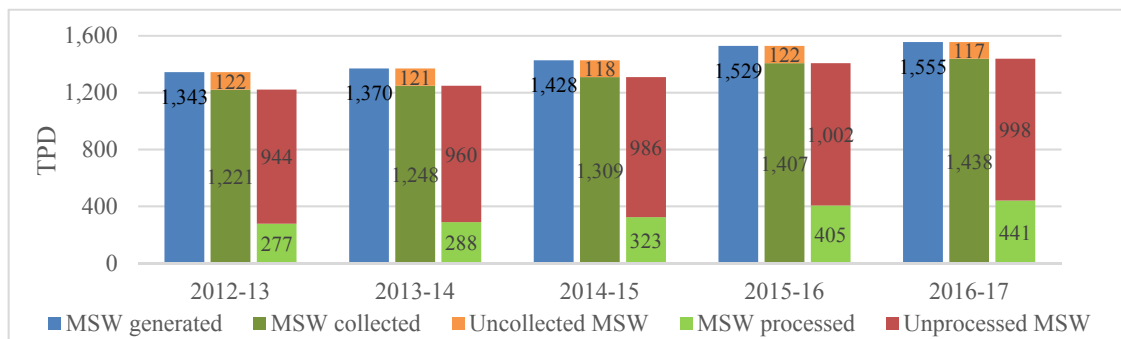
Years	2013-14	2014-15	2015-16	2016-17
Ton per day (TPD)	5,284	5,197	5,342	5,506

Note: Data for 2012-13 not furnished.

Source: Annual Reports of KSPCB

The details of generation, collection and processing of MSW during the years 2012-13 to 2016-17 as per the information furnished by 35 test-checked ULBs are depicted in **Chart 3.1**:

Chart 3.1: Generation, collection and processing of MSW in 35 test-checked ULBs



Source: Information furnished by test-checked ULBs

As evident from above, 92 *per cent* of the waste was collected and only 26 *per cent* was processed each year and a major portion of the remaining MSW was dumped at landfills, which would have a harmful impact on health and environment.

The information furnished by 35 test-checked ULBs was not verified as survey was not conducted to assess the quantum of waste generated during the period from 2012-13 to 2015-16. Most of the data on quantity of MSW were per capita based estimates. However, as per Handbook on Service Level Benchmarks (SLBs), per capita based assessments have low reliability⁵. The quantum of special waste and C&D waste generated by ULBs, were not available with either KSPCB or DMA/ULBs.

DMA stated (June 2017) that assessment of waste generation was conducted in the year 2005 for a period of five years and later in 2016 under Swachh Bharat Mission (SBM) scheme for similar period. The fact, however, remains that after 2010, no survey/assessment was done for the period 2010-16. Audit also attempted to estimate the per capita waste quantity by adopting the municipal refuse generation rates suggested in MSWM Manual, 2000 (Section 3.3.6.2) and found that the per capita estimates indicated by ULBs were in variance with the audit estimation, as detailed in **Appendix 3.2**. Hence, the assessment of waste by ULBs was not realistic.

While accepting audit's observation regarding MSW, the State Government stated (May 2018) that assessment of plastic waste and C&D waste was being carried out in the SWM DPRs prepared under SBM. The assessment of e-waste and bio-medical waste generated by households was not done as the quantity generated was very little in comparison with MSW. The reply is not convincing as these wastes require special handling and disposal due to their physical and chemical characteristics.

3.3 State Policy and strategy on solid waste management

MSWM Manual 2000 (Section 25.2) stipulated that the State Government should prepare a State Policy and strategy on SWM. The Secretary, UDD notified a State Policy for integrated SWM in August 2004. The Policy highlighted that a long-term management strategy and action plan would be developed. We observed that strategy documents and action plans addressing the following crucial aspects were not prepared. As a result, the State Policy was not fully operationalised.

- a. Assessment of MSW generation in various ULBs and identification of the best possible means for managing it;
- b. Setting operational targets for each of the waste management activities and indicating the means of achieving them for various ULBs;
- c. Setting out roles and responsibilities of stakeholders under various contract arrangements; and
- d. Developing resource (human and financial) utilisation guidelines for different categories of ULBs.

⁵ Highest/preferred level of reliability - 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).

Subsequently, the MSWM Manual 2016 (Section 1.4.1.4) and Rule 11(a) of SWM Rules, 2016, stipulated that the Secretary, UDD should prepare the State Policy, consistent with these rules, National Policy on SWM and National Urban Sanitation Policy of the MoUD, by April 2017. Audit observed that this was not done. Non-revision of State policy and strategy is bound to affect effective planning in all ULBs adversely. The State Government may refer to the efforts made by Ahmedabad Municipal Corporation (AMC) in this regard (detailed in **Appendix 11.1**).

The State Government stated (May 2018) that State Policy and strategy as per SWM Rules, 2016 was under preparation stage (tender floated).

3.4 Municipal solid waste management plan

MSWM Manual, 2000 (Sections 26.1 and 26.2) and 2016 (Section 1.4.5 and 1.4.6) emphasised the need for ULBs to prepare a detailed SWM plan, with short term (2-5 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 of implementing all plan activities. Short-term plan should cover aspects of institutional strengthening, community mobilisation, waste minimisation initiatives, waste collection and transportation, treatment and disposal, and financial outlay.

We observed that during the audit period (2012-13 to 2016-17), municipal authorities neither prepared short-term plans nor long-term plans, which deprived ULBs the opportunity of adopting a systematic approach to SWM. In the absence of these plans, the planning and selection of infrastructure projects in ULBs was, to a large extent, driven by perceived availability of funds rather than a need-based analysis. Audit observed instances of construction of sanitary landfill pit without purchasing sieving/sorting machine, inadmissible works, idle investments, *etc.*, as detailed in subsequent chapters.

The State Government accepted (May 2018) the audit observation and stated that as 100 *per cent* implementation of Integrated Solid Waste Management could take some time, short-term and long-term activities that needed to be taken up would be circulated to all ULBs shortly.

3.5 Detailed project reports for solid waste management

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

We observed that the DUDCs invited (November-December 2015) tenders for preparing DPRs for all ULBs under their jurisdiction from agencies empanelled by GoI and entrusted the work on the basis of terms of reference (ToR) provided by the State Government. The ToR stipulated time limit of 50 days for completion and finalisation of each DPR.

As of March 2018, DPRs of 223 out of 281 ULBs (except BBMP) were prepared; of which, High Powered Committee approved 218. In the remaining 58 ULBs, preparation of DPRs did not commence, even after a lapse of more than two years.

In respect of 35 test-checked ULBs, six⁶ empanelled agencies prepared DPRs for 28 ULBs. CC, Ballari and Hubballi-Dharwad Municipal Corporation (HDMC) prepared DPRs on their own. As of March 2018, all the 30 DPRs were approved. In five⁷ new ULBs (erstwhile Gram Panchayats), DPR preparation was not taken up as these were upgraded during 2015-16.

Review of DPRs of 30 test-checked ULBs showed the following deficiencies:

3.5.1 Inadequate estimation of waste generated

Section 1.4.3.3.1 of Manual on MSWM, 2016 stipulated that for the purpose of long term planning, the average amount of waste disposed by a specific class of generators may be estimated only by averaging data from several samples. These samples were 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 be aggregated over the seven-day period, weighed and averaged. These quantities could then be extrapolated to the entire ULB and per capita generation assessed.

Audit observed that none of the 30 ULBs for which DPRs were prepared, adhered to the prescribed methodology. Twenty⁸ test-checked ULBs assessed waste generated by conducting a sample survey for three consecutive days in one season only. One ULB (T. Narasipura) assessed waste generation by conducting a sample survey for seven days in a single season. One ULB (HDMC) did not conduct any survey but adopted population estimation/per capita method to arrive at the average waste generated in ULB. Remaining eight ULBs claimed to have quantified the waste by collecting samples but there was no documentary evidence for having conducted any survey.

The State Government stated (May 2018) that due to lack of time, 3 to 7 days sampling period for short term planning was followed and uniformity could not be ensured. The reply, however, does not address the issue of estimation of waste for long term planning as already discussed in Paragraph 3.2.

⁶ M/s. All India Institute of Local Self Government (AIILSG), Pune (Manvi and Raibag); M/s. IRG Systems South Asia Private Limited (Bidar, Dandeli, Karwar, Bhatkal, Humnabad, Kumta, T. Narasipura, Honnavara); M/s. MaRS Planning and Engineering Services Pvt Ltd, Ahmedabad (Hosapete, Nanjangud, Sagar, Udupi, Magadi, Malur, Kudligi); M/s. MSV International Inc. (Maddur); M/s. Tata Consulting Engineers Ltd (Mangaluru, Bagalkote, Koppa, Sringeri); and M/s. Tide Technocrats Pvt Ltd, Bengaluru (Tumakuru, Chintamani, Shidlaghatta, Sira, Hiriyyur, Gudibande).

⁷ Three TMCs (Kakkera, Mugalkhod and Ugar Khurd); two TPs (Ainapura and Chinchali).

⁸ CC, Tumakuru; CMCs - Bidar, Chintamani, Dandeli, Hosapete, Karwar, Nanjangud, Shidlaghatta, Sira and Udupi; TMCs - Bhatkal, Hiriyyur, Humnabad, Kumta, Maddur and Manvi; TPs - Gudibande, Honnavara, Kudligi and Raibag.

3.5.2 *Incomplete coverage of waste generators and non-assessment of unprocessed waste dumped at landfill*

A complete and reliable database is essential for effective planning. Section 1.4.3.3.2 of Manual on MSWM, 2016 stipulated that multiple samples at multiple locations need to be taken to determine waste composition as daily, seasonal and temporal fluctuations are usually observed within a ULB. Hence, data on waste generation should capture all types of waste generation (including temporal fluctuations) and existing quantity of unprocessed MSW dumped in landfill sites in and around the city.

We observed that none of the DPRs included generation of solid waste from public buildings such as places of public worship (except Udipi and Maddur), industrial buildings (except HDMC and Sagar), *etc.* The DPRs did not capture and include temporal fluctuations (festivals/functions – social, economic, religious, political, *etc.*) in generation of waste in urban limits. Thus, the database lacked complete and significant data required for waste assessment.

Further, 21 out of 30 DPRs did not mention the quantum of unprocessed waste dumped at landfill sites. DPR of CMC, Sira indicated the quantum of waste accumulated (3,070 tons) at the dumpsite based on a topographical survey⁹ (July 2016). We compiled the weighbridge data maintained by CMC, Sira and observed that waste dumped at this site during the period of 15 months (April 2015 to July 2016) was 7,647 tons. Hence, the quantum of waste accumulated as mentioned in the DPR was inconsistent with ULB's data. Similarly, the authenticity of quantification as mentioned in DPRs of remaining eight¹⁰ ULBs was not verified as these ULBs did not have any/working weighbridge facility.

The State Government accepted (May 2018) the observation regarding incomplete coverage and stated that actual position in respect of CMC, Sira would be intimated to audit.

3.5.3 *Non-coverage of special waste*

The State Level Technical Committee (constituted in January 2016 to accord technical approval to DPRs) opined in its first meeting (February 2016) that measures to manage other wastes like e-waste, hazardous waste, hospital waste, industrial waste, *etc.*, should be addressed in DPRs.

We observed that none of the 30 DPRs addressed measures to manage e-waste, hazardous waste, hospital waste and industrial waste.

The State Government stated (May 2018) that this issue was considered in the recent DPRs prepared in the year 2017-18. It further stated that assessment of e-waste, bio-medical waste and plastic waste was not done earlier as the quantity compared with generation of MSW was very little. The fact remains that the directives of State Level Technical Committee were not complied with and documentary evidence in support of the reply was not furnished.

⁹ Topographical surveys are used to identify and map the contours of the ground and existing features on the surface of the earth or slightly above or below the earth's surface (*i.e.* trees, buildings, streets, walkways, manholes, utility poles, retaining walls, *etc.*).

¹⁰ HDMC; CMCs – Chintamani and Shidlaghatta; TMCs - Hiriyur, Maddur and Manvi; TPs - Gudibande and Raibag.

3.5.4 Incorrect assessment of design capacity

Quantity of waste generated in the city needs to be assessed to establish adequacy of existing systems and to plan for augmentation of treatment and disposal facilities.

We observed that 13 of the test-checked DPRs wrongly assessed the design capacity of disposal facilities in ULBs. **Table 3.2** depicts significant cases of over/under assessment of design capacity.

Table 3.2: Statement showing over/under assessment of design capacity in DPRs

Sl. No.	Name of ULB	(Weight in TPD)				Over(+)/Under(-) assessment of design capacity	Resultant Over(+)/Under(-) assessment of capital expenditure (₹ in crore)
		Projection of waste generation (2021)	Existing capacity	Design capacity required	Design capacity exhibited in DPR		
1	Mangaluru	411	200	211	422	(+)211	6.28
2	Maddur	11.10	0.38	10.72	15.30	(+)4.58	2.20
3	Bidar	83.68	0	83.68	104.77	(+)21.09	2.25
4	Bagalkote	56.96	20	36.96	59	(+)22.04	2.28
5	Koppa	2.49	0.94	1.55	2.59	(+)1.04	0.41
6	HDMC	478	3	475	400	(-)75	(-)11.28

Source: DPRs of test-checked ULBs

There is a possibility of over/under assessment of design capacity due to unrealistic assessment of waste as detailed in Paragraph 3.2.

3.6 Non-preparation of contingency plans

MSWM Manuals, 2000 (Section 26.1) and 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.

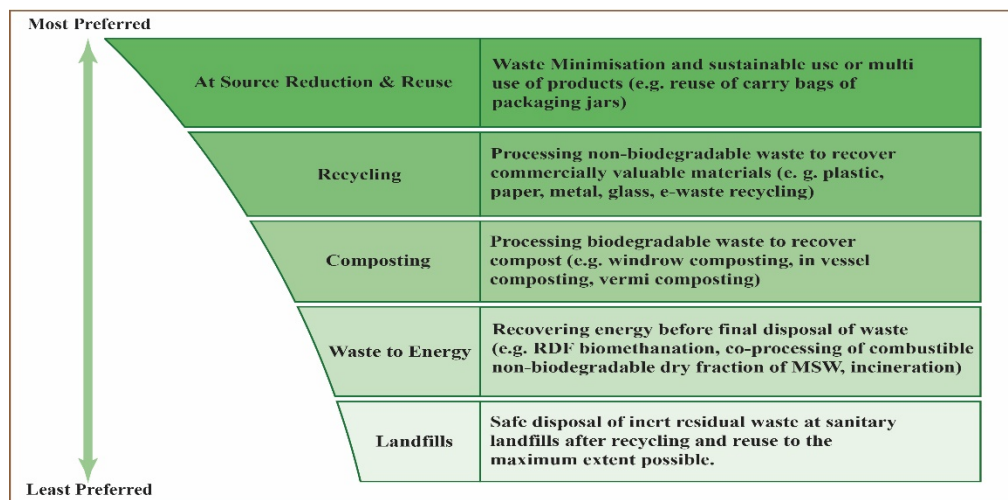
Requirement of a contingency plan was neither envisaged in the State Policy on SWM (2004) nor addressed by any of the test-checked ULBs. As a result, ULBs were not prepared to tackle any unforeseen situation, crises such as public protest in CC, Tumakuru, when the villagers did not allow (2014) passage of waste transportation vehicles, resulting in piling up of waste on streets, instances of fire at landfill sites in CC, Ballari, HDMC, CMC, Bidar, CMC, Dandeli, *etc.*

The State Government stated (May 2018) that a contingency plan to tackle any unforeseen situations would be included in the State Policy and strategy.

3.7 Strategy for implementation of 3R approach


MSWM Manuals, 2000 (Section 2.3) and 2016 (Section 2.1) prescribe 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) approach, which helps to reduce the quantity of waste, the cost associated with its handling, and its environmental impacts.

The Manuals also stipulated that waste minimisation strategies require policy interventions at the national, state and local level. ULBs were to play a pioneering role by reducing the amount of waste to be handled.



Source: MSWM Manual, 2016

We observed that though the principle of creating public awareness regarding minimising of waste was mentioned in the State policy (2004), the State Government had not operationalised a focussed waste minimisation strategy so far (December 2017). With the exception of TMC, Kumta, no other test-checked ULBs took up initiatives to promote waste minimisation and reuse activity exclusively.

Good practice	
TMC, Kumta introduced (January 2016) decentralised composting systems such as pipe composting (household waste) and pit composting (horticulture and market waste) for converting wet waste into compost. TMC also initiated collection of food waste from 40 restaurants and marriage halls. These initiatives resulted in processing of 1,684 tons of wet waste during the period from January 2016 to March 2017, thus, reducing the burden on the landfill site to that extent.	

The State Government stated (May 2018) that the strategy for waste minimisation was being adopted in the upcoming State policy.

3.8 Non-involvement of all stakeholders in planning

The provisions of MSW Rules, 2000 and 2016, and State Policy (2004) recommended extensive involvement of community in waste management. Manual on MSWM, 2016 (Section 1.4.4) provided for constitution of a core team or advisory team (internal stakeholders) involving all departments concerned with SWM services for developing the MSWM plan and involvement of the community (external stakeholders comprising households, informal sector, NGOs, CBOs, SHGs, women's groups, etc.), in MSWM planning and implementation.

We observed that neither a core/advisory team (internal stakeholders) nor a stakeholder committee (external stakeholders) was formed in any of the test-checked ULBs.

Although this was not done for 17 years, the State Government stated (May 2018) that this would be considered in the upcoming SWM State policy and comprehensive strategy.

3.9 Non-integration of informal waste collectors in waste management

MSWM Manuals, 2000 (Sections 8.6 and 9.6), 2016 (Section 2.3.7) and SWM Rules, 2016 (Clauses 11(c) and 15(c)) 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. It is the duty of ULB to establish a system to recognise organisations of informal waste collectors and establish a system to facilitate their participation in SWM.

We observed that though the State Policy (2004) proposed utilising the services of NGOs to provide support to the informal sector, no guidelines were issued in this regard. The test-checked ULBs (except CMC, Bagalkote) failed to recognise organisations of informal waste collectors and to integrate them in SWM. CMC, Bagalkote, made (January 2013) a beginning by identifying rag pickers and issued identity cards to 85 rag pickers (as of September 2017). The model adopted by Pune Municipal Corporation is detailed in **Appendix 11.2**.

The State Government stated (May 2018) that steps would be taken to enumerate waste pickers and impart necessary training.

Recommendation 1: The State Government may expedite preparation of State policy incorporating strategies for waste minimisation and management.

Recommendation 2: The State Government needs to devise better information systems to assist ULBs in preparation of action plans for effective implementation of waste management.

Recommendation 3: The State Government may ensure pro-active and continuous engagement of non-government sector in waste management.

3.10 Institutional mechanism

For planning an efficient and advanced MSWM system, it is essential to have an efficient institutional structure besides having adequate infrastructure and equipment (Sections 19.1 and 25.3 of Manual on MSWM, 2000 and Section 1.4.5.4 of Manual on MSWM, 2016).

The State Government constituted the three state-level committees required as per SBM guidelines (2014) and SWM Rules, 2016.

The District and ULB level Committees were not constituted, indicating lack of effective institutional mechanism leading to poor support to the effective implementation of SWM plans. The Committee-wise details are indicated in **Appendix 3.3**.

Good practices on engagement of ward level committees in Corporation of Cochin and Andhra Pradesh are detailed in **Appendix 11.3**.

3.11 Outsourcing of solid waste management activities

The test-checked ULBs outsourced few of the activities and the extent of outsourcing was higher in test-checked CCs compared with other ULBs. Majority of the other tiers of test-checked ULBs (CMCs/TMCs/TPs) were managing SWM services on their own, exception being:

- three CMCs (Dandeli, Nanjangud and Udupi); TMC, Bhatkal and TP, Gudibande which engaged SHGs/private agencies for door-to-door collection; and
- four CMCs (Bagalkote, Karwar, Shidlaghatta and Udupi) and two TMCs (Maddur and Malur) which engaged private sector for street sweeping and transportation.

Audit reviewed the terms and conditions of the agreements entered into by test-checked ULBs and observed following deficiencies which adversely affected the interest of the Government/service providers.

- Grievance redressal mechanism - SWM is a citizen-centric activity. The agreements, however, did not have local grievance redressal mechanism against the service provider. As a result, the status of citizens' grievances and their redressal was not ensured;
 - Force Majeure clause – the agreements contained force majeure clauses. However, the removal of waste after a natural disaster is seminal to public health since failure to remove waste would increase the chances of epidemics and spread of fatal diseases. Hence, an appropriate clause to take care of restoration of services should be included;
 - Arbitration - ULBs function under the control of DCs. However, the agreements contained arbitration clause referring the arbitration to the concerned DCs. This not only evidenced departmental bias but was also against the spirit of Government Order dated 10.01.2014 which directed all arbitral proceedings to the Karnataka Arbitration Centre; and
 - Segregation - Source segregation by waste generators will not be successful unless segregated collection and transportation of segregated waste is practiced by the ULBs.
- a) HDMC entrusted (November 2009) the work of door-to-door collection of MSW from 49 out of 67 wards to private agencies. The agreements, however, did not mention about segregation of waste. As a result, mixed waste was being transported and dumped at landfill.

b) Similarly, CC, Tumakuru, entered into an agreement (June 2015) with M/s. Sadhana Enviro Engineers Services, Bengaluru for operation and maintenance (O&M) activities wherein one of the conditions was that CC would be delivering mixed municipal waste to the agency. There was no commitment clause for reducing the amount of mixed waste over the years to reach a goal of 100 per cent segregation in a fixed duration.

- The scope of the agreement entered into by CC, Tumakuru envisaged payment of electricity charges, water charges, payments for staff, *etc.*, by the contractor. We observed that CC, Tumakuru incorrectly computed the monthly deductible amount resulting in excess payment of ₹40.86 lakh during the period from June 2015 to February 2017.
- Ambiguous terms and conditions - The terms of agreements should be clear and free from ambiguity. CC, Tumakuru engaged (February 2014) a service provider for door-to-door collection and transportation of MSW. Instead of prescribing specific periodicity for collection of dry waste, CC stipulated that dry waste was to be collected 'daily or twice in a week periodically whichever was convenient to the service provider'. Further, the penalty for non-collection of MSW even for a single day was specified as 'non-collection part of that area's amount'. Such a condition was vague and therefore, difficult to enforce. Further, the agreement did not specify the method of calculation of penalty.
- Basis for payments - Moisture increases the weight of MSW, and therefore the cost of collection and transportation increase. To prevent an increase in weight, waste should be insulated from rainfall or other extraneous water (Section 3.3.7.2 of Manual 2000 and Section 1.4.3.3.3 of Manual 2016). Further, Guidebook on Swachh Bharat stipulated that the cleaning work should never be entrusted only on a per-ton-payment basis or per-trip distance basis. This would encourage malpractice of falsifying bills for trips made and resist waste minimisation. So payment should be based on a maximum allowed weight per vehicle volume. Contracts can preferably be given on a per-capita or per-household basis (Section 6.6).

CC, Mangaluru entrusted (August 2014) the work of door-to-door collection and transportation to M/s. Antony Waste Handling Cell Private Limited, Mumbai, at the rate of ₹3,201 per ton for North Zone and at the rate of ₹2,051 per ton for South Zone. The work of O&M of composting plant, vermi composting and sanitary landfill site at Mangaluru was entrusted (May 2013) to M/s. Unique Waste Processing Company Limited at rate of ₹238 per ton (tipping fee) of incoming MSW.

We observed that the CC did not take cognizance of the fact that Mangaluru is a coastal city and moisture content of MSW increases considerably during monsoon period (June to October). We analysed the month-wise data for the period from 2013-14 to 2016-17 and observed that the average quantities of incoming waste during monsoon period were higher by 2,319.29 tons than those during normal period (November to May). The payments to the extent of ₹51.20 lakh to M/s. Antony Waste Handling Cell Private Limited and ₹26.60 lakh to M/s. Unique Waste

Processing Company Limited towards excess quantities could have been avoided had the CC factored the impact of moisture content while finalising the contract.

The State Government stated (May 2018) that comments would be submitted to audit on receipt of replies from test-checked ULBs.

Recommendation 4: The State Government may revise the model agreement for each SWM service/activity considering the deficiencies pointed out. It should be ensured that the terms and conditions of the agreement are clear, free from ambiguity and protect the interests of ULB/Government.

3.12 Service level 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 of performance-based grants to ULBs. MoUD defined a common minimum framework for monitoring and reporting on performance indicators; of which eight performance indicators (detailed in **Appendix 3.4**) pertain to SWM.

3.12.1 Targets and achievement in test checked Urban Local Bodies

Analysis of SLB declarations (2016-17) by 30 test-checked ULBs (except five newly formed ULBs) in respect of these performance indicators (except efficiency in redressal of customer complaints) showed that in certain cases, targets were set at extremely low levels. As per ULBs' declarations, extent of segregation, recovery of MSW, scientific disposal and cost recovery of MSW in majority of the test-checked ULBs were significantly below the targets fixed/benchmarks. Achievements of these ULBs *vis-à-vis* targets and benchmarks in respect of these performance indicators are depicted in **Appendix 3.5**.

The correctness of the achievements declared by ULBs was not verified as ULBs did not furnish any documentary evidence in support of their claims. The Handbook on SLB prescribed by MoUD emphasises the need to ensure reliability of measurement and specifies four levels of reliability for each indicator. ULBs should strive to move towards the highest/preferred level of reliability.

The State Government stated (May 2018) that for any given ULB, performance indicators are improving progressively year by year. The reply, however, does not address the audit observation regarding correctness of the data on achievements *vis-à-vis* SLBs.

Recommendation 5: The State Government may draw a time-bound plan for ULBs to achieve the highest/preferred level of reliability of SLB data.

3.13 Allocation of responsibility and accountability

Identification of nodal agency 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 strongly recommends that ULBs should have an SWM cell or SWM department having staff with technical and managerial skills specific to MSW management.

As per provisions of MSW Rules, 2000 (Clause 5) and SWM Rules, 2016 (Clause 11), Secretary, UDD has the overall responsibility for the enforcement of the provisions of these rules in the metropolitan cities (except BBMP). The Director of Municipal Administration (DMA) assists the Secretary, UDD, in ensuring implementation of provisions of these rules by all ULBs and is the nodal agency at State level. An SWM cell, headed by Executive Engineer, assists the DMA on technical and managerial aspects of MSWM. DMA also coordinates with State Pollution Control Board to ensure compliance of SWM norms prescribed under the relevant rules.

➤ Lack of accountability at district level

At district level, Deputy Commissioner (DC) of the district with the assistance of Project Director, DUDC, is responsible for monitoring activities of ULBs including SWM. Executive Engineer and Assistant Executive Engineer support the Project Director in discharging his duties. We, however, observed that DUDC did not have a dedicated SWM cell or staff with technical and managerial skills specific to MSWM. There is no record to indicate whether DUDC is monitoring SWM related activity. Its role was confined to obtaining approval of DC for action plans (SWM) of ULBs and assist ULBs in obtaining approval of DC for designated site identified for C&D waste, common facility for bio-medical waste disposal, *etc.*

The State Government (May 2018) stated that posts of Assistant Executive Engineer (Environment) were proposed at DUDCs in the recent amendment to Municipality (C&R) Rules exclusively for effective implementation of SWM at ULB level.

➤ Manpower/staff constraints

At the ULB level, there was no required SWM cell to take care of SWM activities exclusively. The existing staff manage both SWM and sanitation activities in the ULBs. The staff position for SWM cum sanitation activities in the test-checked ULBs is given in **Table 3.3**.

Table 3.3: Statement showing the staff position (sanctioned strength, person-in-position and vacancy) for SWM cum sanitation activities in test-checked ULBs

ULB	Environment Engineers			Health inspectors			Pourakarmikas		
	SS	PIP	Vacancy (Percentage)	SS	PIP	Vacancy (Percentage)	SS	PIP	Vacancy (Percentage)
CCs	21	14	7 (33)	120	27	93 (78)	3,379	1,112	2,267 (67)
CMCs	11	09	2 (18)	66	30	36 (55)	1,600	574	1,026 (64)
TMCs	12	07	5 (42)	37	12	25 (68)	485	204	281 (58)
TPs	-	-	-	8	1	7 (88)	120	76	44 (37)
Total	44	30	14 (32)	231	70	161 (70)	5,584	1,966	3,618 (65)

Source: Information furnished by test-checked ULBs SS: Sanctioned strength; PIP: Person-in-position

It is seen from the table above that there was shortage of manpower at all cadres viz. Environment Engineer (32 per cent); Health Inspectors (70 per cent) and *Pourakarmikas* (65 per cent). For TPs, there was no sanctioned post of Environment Engineer. Hence, existing Health Inspector was in-charge of SWM in TPs. In order to address the vacancies in the post of *Pourakarmikas*, all test-checked ULBs except the five newly upgraded ULBs outsourced manpower.

The posts of Environment Engineers were created during July, 2004. We observed that the post was vacant in five test-checked CMCs/TMC (Dandeli, Hosapete, Humnabad, Nanjangud and Sira) for periods ranging up to five years during the review period. Absence of technical officers affected the implementation of approved action plans.

In CMC, Nanjangud, purchase of auto tippers was planned in 2013-14, 2015-16 and 2016-17 but actual purchase was effected (June 2017) only after the posting of an Environment Engineer in December 2016. CMC has been using pushcarts for collection of MSW from door-to-door instead of using auto tippers as per norms included in State policy issued in 2004. The collection of MSW was, thus, partial (only 9 out of 27 wards covered). Purchase of auto tippers would have ensured greater coverage in collection of waste.

More than 50 per cent of the posts of Health Inspector were vacant in the test-checked ULBs. Apart from SWM cum sanitation activities, Health Inspectors were also required to manage several other activities such as birth and death registration; preparation and updation of statistics; initiate action for removal of unauthorised hoardings; tackle animal menace, etc. The combination of an extensive job profile and acute shortage of manpower could have an adverse impact on the ability to meet the rigorous demands of SWM activities.

Severe shortage of manpower affected effective implementation and monitoring of SWM activities particularly collection and segregation of MSW in ULBs (detailed in subsequent paragraphs on collection and segregation).

The State Government accepted the audit observation and stated (May 2018) that necessary steps would be taken to bridge the gap in availability of human resource.

Recommendation 6: The State Government may ensure that the required District/ULB level Committees are constituted for effective institutional mechanism and implementation of SWM plans.

3.14 Capacity building

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

Test-check of documents collected from training centres viz. State Institute of Urban Development, Mysuru (SIUD) and City Managers' Association Karnataka (CMAK), Bengaluru, showed that training, workshops, conferences on SWM were conducted for various target groups such as Mayors, Elected Representatives, Project Directors, Commissioners/Chief Officers, Engineers, Health Inspectors and *Pourakarmikas*.

➤ ***Poor turnout for training***

SIUD is the nodal agency to develop training modules/content and provide training to personnel of UDD for different urban development related activities. Accordingly, DMA provided funds for training courses to SIUD. The progress reports of SIUD revealed that it conducted (2012-13 to 2016-17) 31 training courses in connection with SWM activities.

Check of the training slots provided and those actually attended by officers/staff of ULBs showed that the utilisation of training slots in 21 of these 31 courses was less than *75 per cent*. Course-wise details are given in **Appendix 3.6**. Poor utilisation of training activities rendered the effectiveness of training questionable. We also observed that there were no mandatory modules prescribed for SWM staff.

The State Government stated (May 2018) that the shortcomings in training would be addressed.

Thus, absence of adequate and trained staff is indicative of the lack of commitment of State Government towards SWM.

Recommendation 7: The State Government may devise mandatory modules for training all personnel involved in SWM and ensure coverage of all personnel within a specified period.