



*Windrow Composting Unit,  
Kothamangalam Municipality  
September 2021*

## **CHAPTER III**

### **SEGREGATION, COLLECTION AND TRANSPORTATION OF WASTE**





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ULBs did not have an effective mechanism to check whether the waste generators segregated waste into biodegradable, non-biodegradable, sanitary and domestic hazardous categories. We observed that colour coded bins were not provided by ULBs to households or placed at Government Offices and hospitals visited, as a preliminary step in segregation of waste generated. Non-adherence to extant provisions resulted in unsegregated waste reaching processing sites and landfills meant for hazardous waste. Extent of door-to-door collection of waste from households and from restaurants and chicken stalls/meat stalls in selected ULBs ranged from 16.13 *per cent* to 54.72 *per cent*. Food waste and poultry waste was collected by unauthorised agencies and disposed as feed to pigs. As collection of biodegradable waste from households was not effective, waste generated was dumped in water bodies, public places, road sides, etc. The ULBs could not ensure segregation of waste by waste generators due to which biodegradable waste mixed with non-biodegradable waste reached processing sites.

The system of segregation and collection of waste was not functioning as envisaged and needed to be strengthened. Open vehicles and vehicles without partition were used for waste transportation. In the test-checked Corporations, we noticed that own vehicles purchased were idling, yet private vehicles were hired and utilised for waste transportation. Delay occurred in conducting timely repair and maintenance of vehicles purchased by the Corporation.

The waste generated in a ULB pass through various stages, *viz.*, segregation, collection, transportation, processing and disposal. The overall functioning of the system of waste management in a ULB could be termed satisfactory, only if each of these tasks is performed in a scientific and sustainable manner. Audit analysed the effectiveness of field level execution of various municipal tasks associated with waste management.

#### 3.1 Segregation

Segregation refers to the process of separation of municipal solid waste into four groups - organic, inorganic, recyclables and hazardous waste. Segregation is a critical requirement since it enables reuse, recycling, treatment and scientific disposal of different components of waste. Segregation takes place at different levels such as source/household, centralised sorting facility and waste processing sites and leads to minimisation of waste and reduction in landfill space for final disposal.

##### 3.1.1 Inadequate segregation of waste at source

As per SWM Rules, 2016, every waste generator was to segregate and store the waste generated by him in separate streams, *viz.*, biodegradable, non-biodegradable and domestic hazardous waste in suitable bins and hand over to authorised waste collectors. Used sanitary waste like diapers and sanitary pads as well as Construction and Demolition waste and Horticulture and garden

waste were to be stored separately by the waste generator and disposed of as per direction of local bodies.

The details of segregation of waste by households, Government offices and commercial establishments in test-checked ULBs, are presented in **Table 3.1**.

**Table 3.1: Segregation of waste by households, Government offices and commercial establishments in 21 test-checked ULBs<sup>40</sup>**

Type of waste generator	Households	Government offices	Commercial establishments
<b>Total number</b>	1075820	2426	180130
<b>Number of waste generators segregating waste at source as claimed by ULB</b>	507470	1468	61607
<b>Percentage of waste generators segregating waste at source</b>	47.17	60.51	34.20

(Source: Data furnished by test-checked ULBs)

Though the ULBs furnished number of households and institutions wherein waste was stated as segregated at source, Audit observed that the ULBs were accepting the number of households/institutions as furnished by Haritha Karma Sena, which collected waste from these units. The ULBs did not have any mechanism to check whether the waste generators segregated waste into prescribed streams of biodegradable, non-biodegradable, sanitary, domestic hazardous, etc. Thus, the data provided by the ULBs did not inspire confidence regarding the exact number of waste generators segregating waste at source, as envisaged in SWM Rules/Manual. The ULBs, through periodic inspections, need to gather reliable data regarding the actual number of units segregating waste into stipulated streams.

Audit analysed the details of segregation of waste as furnished by 21 test-checked ULBs (**Appendix 4**). Except one ULB (Alappuzha), the percentage of segregation of the remaining 20 ULBs ranged between 0.41 and 72.72. Non-adoption of effective methods of segregation at source contributed to substantial amount of mixed waste reaching centralised waste processing facilities, resulting in components of waste being classified as 'rejects'.

### 3.1.2 Issue of Bins

Swachh Bharat Mission (Urban) Guidelines envisaged ULBs to distribute two colour coded bins, one in green and the other in blue per household, such that waste is segregated into wet (biodegradable) and dry (non-biodegradable) respectively, at source itself. Audit observed that none of the test-checked ULBs provided colour coded bins to households for segregation of waste. Koyilandy Municipality was the only test-checked ULB which provided litter bins in public places. Thiruvananthapuram Corporation had set up Dry waste

<sup>40</sup>One test-checked ULB, Perinthalmanna Municipality, had entrusted SWM to an agency named Jeevanam solutions. The agency had not furnished the details of status of execution to the ULB. Despite Audit seeking details directly from the agency, the agency did not furnish the same

segregated collection hubs at various locations for collection of non-biodegradable waste.

Segregation of household waste into biodegradable and non-biodegradable at source using bins would reduce the extent of secondary segregation at Material Recovery Facility (MRF) where secondary storage and sorting of recyclable materials are done. Lack of effective IEC activity on importance of segregation of waste at source might have contributed to low segregation of waste by households.

During joint physical verification (JPV) at Government offices and hospitals, Audit observed that separate bins were not allotted and all the waste were collected in single bins as mixed waste, making segregation difficult and time consuming. Instances of burning mixed waste were noticed in four Government offices<sup>41</sup> and seven Government hospitals<sup>42</sup> which would cause hazardous impact on human health and environment.



*Burning of Mixed Waste at Cheruvannur CHC, Kozhikode Corporation (October 2021)*



*Open burning of plastic waste at Municipal office, Aluva (July 2021)*

### **3.1.3 Segregation of Domestic hazardous waste**

Domestic hazardous waste such as used batteries, expired medicines, discarded paint drums, CFL bulbs, etc. required special handling and disposal. None of the test-checked ULBs published the list of domestic hazardous waste and 18 ULBs did not conduct any IEC programme, so as to make public aware of the types of domestic hazardous waste likely to be generated by them and the need for segregation of such waste. During JPV at Kochi Corporation, Audit noticed that non-segregation of waste resulted in mixing of domestic hazardous waste

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<sup>41</sup>Civil Station, Kozhikode, Mini Civil Station, Kayamkulam, Taluk Office, Ambalapuzha, Aluva Municipal Office

<sup>42</sup>Taluk hospital, Feroke, ESI dispensary, Eranhipalam, ESI Hospital, Thiruvananthapuram, District Hospital, Nedumangad, General Hospital, Neyyattinkara, CHC Cheruvannur and District Hospital, Vadakara



*Burning of Waste by Thumboormuzhi workers in Thiruvananthapuram Corporation (August 2021)*

with other waste which reached the processing site. This resulted in accumulation of rejects containing such waste at processing sites, which would necessitate additional financial commitment for segregation and disposal.

### **3.1.4 Segregation of Sanitary Waste**

The SWM Rules, 2016 stipulated that waste generators shall wrap the used sanitary waste like diapers, sanitary pads, etc. securely in pouches provided by the manufacturers/brand owners of these products and place them in the bin meant for non-biodegradable waste. However, in 16 test-checked ULBs, sanitary waste was seen mixed with other non-biodegradable waste, thereby contributing to the reluctance of ULB staff to segregate them manually. Instances of ULB staff themselves burning mixed waste containing sanitary waste were noticed in Thiruvananthapuram Corporation, which was hazardous to environment and public health. In 115 households visited, 75 households in 16 ULBs reported that they burnt sanitary waste generated within their premises.



*Kochi Corporation - Mixed waste dumped as rejects at the Brahmapuram processing site (November 2021)*

Government stated (May 2022) that a pilot project for disposal of household sanitary waste, bio-medical waste and hazardous waste has been taken up by the State with the support of KEIL<sup>43</sup> and that in the initial phase it is proposed to implement the project in seven ULBs located in the vicinity of KEIL.

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<sup>43</sup> Kerala Enviro-Infrastructure Limited, the only Hazardous Waste landfill facility in the State at Ambalamedu, Kochi.

Audit observed that defective source segregation in test-checked ULBs resulted in ineffectual utilisation of centralised and decentralised processing facilities as detailed in subsequent paragraphs.

### 3.1.5 Segregation of waste at processing site

As the ULBs could not ensure segregation of waste by waste generators, biodegradable waste mixed with non-biodegradable waste reached the processing site. Audit noticed that nine<sup>44</sup> out of 22 test-checked ULBs had centralised/community level facilities<sup>45</sup> for processing biodegradable waste. However, JPV conducted in these nine facilities revealed that only partial segregation was performed at four<sup>46</sup> sites. As such, recovery of recyclable items became difficult which also affected the quality of compost produced. For want of effective segregation at source, ULBs had to incur substantial amount for disposal of waste generated in their jurisdiction.

Four ULBs<sup>47</sup> disposed 1313.21 tonnes of mixed waste as rejects during 2020-21 through Clean Kerala Company Ltd. (CKCL) to KEIL for land filling, thereby committing payment of ₹156.14 lakh. Thiruvananthapuram Corporation as part of converting dumping yard at Erumakkuzhi into a garden, transferred (October 2020) 62.61 tonnes of unsegregated waste to KEIL. As per SWM Rules, 2016, only the non-usable, non-recyclable, non-biodegradable, non-combustible and non-reactive inert waste and pre-processing rejects and residues from waste processing facilities were to be sent to sanitary landfill. Audit observed that ULBs/CKCL violated these Rules by sending unsegregated waste to landfill.

During the exit conference (May 2022), Government accepted that mixed waste generation was indicative of failure of ULBs in ensuring proper segregation and that once mixed waste was generated, the sole option was to treat it as inert waste and dispose of in scientific landfills. Further, the efforts of the State to purchase land to set up landfill facility have not succeeded yet, due to which mixed waste had to be disposed of in the hazardous waste landfill facility of KEIL.

The reply is not acceptable as waste management should necessarily be made a part of urban planning and suitable methods of segregation evolved, to minimise mixed waste generated. Utilising hazardous waste landfill facility for disposing solid waste whenever mixed waste is generated, is not a viable solution.

## 3.2 Collection

Collection of segregated waste was essential to ensure that waste stored at source was not disposed of in streets, drains, water bodies, etc. The ULBs were to arrange for door-to-door collection of segregated solid waste from all

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<sup>44</sup>Kochi, Kozhikode, Thiruvananthapuram Corporations and Perinthalmanna, Kothamangalam, Alappuzha, Eloor, Neyyattinkara, Nedumangad Municipalities

<sup>45</sup>Facilities adopting aerobic composting (windrow, thumboormuzhi), vermi composting, bi-methanation technologies for processing biodegradable waste

<sup>46</sup> Kochi, Kozhikode, Thiruvananthapuram Corporations and Neyyattinkara Municipality

<sup>47</sup> Thiruvananthapuram Corporation and Alappuzha, Malappuram, Kayamkulam Municipalities

households including slums and informal settlements, commercial, institutional and other non-residential premises<sup>48</sup>.

### 3.2.1 Collection of Biodegradable waste

The SWM Rules encourage households to process biodegradable waste at source. However, ULBs are mandated to collect biodegradable waste in a segregated manner and set up common processing facilities, so as to treat spill over waste from establishments and households where there is no available space for setting up individual processing units.

Audit observed that among the test-checked 22 ULBs, 13 ULBs did not collect biodegradable waste from generating units as the State policy advocated source level processing of such waste. Five<sup>49</sup> ULBs collected biodegradable waste from households and markets. The extent of door-to-door collection of waste from households, restaurants and chicken stalls/meat stalls in these ULBs ranged from 16.13 *per cent* to 54.72 *per cent*. The remaining four ULBs<sup>50</sup> collected market waste and deposited in thumboormuzhi bins.

Quantity of biodegradable waste generated and collected in test-checked ULBs is shown in **Table 3.2** below:

**Table 3.2: Table showing quantity of biodegradable waste generated and collected in 18 test-checked ULBs<sup>51</sup>**

	2016-17	2017-18	2018-19	2019-20	2020-21
<b>Generated (tonne)</b>	2,97,615.28	3,04,634.17	3,12,051.82	3,17,848.10	3,03,507.05
<b>Collected (tonne)</b>	1,20,297.58	1,24,696.97	1,30,114.37	1,31,906.35	1,16,097.30
<b>Percentage of collection</b>	40.42	40.93	41.70	41.50	38.25
<b>Percentage of waste not collected</b>	59.58	59.07	58.30	58.50	61.75

(Source: Data furnished by test-checked ULBs)

On an average, 58 to 62 *per cent* of biodegradable waste generated was not being collected in 18 test-checked ULBs. There was no system in place for the assessment of generation and collection of horticulture/garden waste generated in the ULBs.

As substantial quantity of biodegradable waste was to be segregated at source, the ULBs had the responsibility to ensure that the individual waste generating units managed their waste at source itself and that dumping/littering in public places, water bodies, etc. is avoided at all costs. However, Audit observed biodegradable as well as non-biodegradable waste being dumped in public

<sup>48</sup> According to Rule 15 (b) of SWM Rules, 2016

<sup>49</sup> Kochi, Kozhikode Corporations and Kothamangalam, Perinthalmanna (data not available), Aluva Municipalities

<sup>50</sup> Nedumangad, Neyyattinkara, Feroke and Vadakara Municipalities

<sup>51</sup> Four ULBs (Maradu, Mavelikkara, Kayamkulam and Perinthalmanna Municipalities) did not furnish details



places<sup>52</sup>, road sides<sup>53</sup>, water bodies<sup>54</sup>, etc. as evident from photographs presented below.

### Littering/dumping of waste in water bodies



*Aamayizhanjan thodu near KSRTC Central bus stand, Thiruvananthapuram Corporation (July 2021)*



*Killi River, Thiruvananthapuram Corporation (August 2021)*

The Sustainable Development Goal (SDG) 11.6 prescribed reduction in adverse per capita environmental impact of cities by paying special attention to air quality and municipal and other waste management by the year 2030. One of the targets to be achieved to attain the above goal was 100 *per cent* door-to-door collection of waste. Instances as revealed above, in addition to distancing the State from achieving the SDG goals, raise serious concern regarding the efficacy of ground level execution of the State campaign ‘My Waste My Responsibility’.

#### **3.2.1.1 Collection of waste from Community halls, restaurants, etc.**

Government of Kerala instructed (July 2017) ULBs to issue directions to establishments generating biodegradable waste such as community halls, hotels, restaurants, etc. to set up suitable facilities like biobin, aerobin, biogas plant, etc. for processing biodegradable waste at source, before 15 September 2017. However, 18 test-checked ULBs had not complied with the above order. Of 3131 restaurants/ community halls in 21 test-checked ULBs, only 292 (9.32 *per cent*) possessed source level treatment facilities. Audit conducted JPV in 171

<sup>52</sup>Thiruvananthapuram, Kochi Corporations and Aluva, Alappuzha, Perinthalmanna Municipalities

<sup>53</sup> Mavelikkara, Aluva, Muvattupuzha, Kayamkulam Municipalities and Kochi Corporation

<sup>54</sup> Thiruvananthapuram, Kochi Corporations and Kayamkulam, Mavelikkara Municipalities

restaurants which revealed that 154 restaurants (90 per cent) did not have source level treatment system. Waste from restaurants were collected by unauthorized agencies and transferred to pig farms in 20<sup>55</sup> out of 22 ULBs. It is pertinent to note that disposal of waste as feed to pigs is not an authorized method of waste disposal as per SWM Rules, 2016 and as per Section 435 of KM Act.

Joint physical verification with municipal staff revealed that 139 of the 171 test-checked restaurants (81 per cent) did not have facility to treat waste water and resultantly, the waste water generated was routed to drains in the vicinity. Audit observed that 14 ULBs had not conducted inspections in the establishments periodically or during renewal of licence, to ensure proper disposal of solid/liquid waste by these establishments.

During December 2020 to March 2021, the District Pollution Control Board (DPCB), Kozhikode issued notices to 51 establishments (29 hotels) which discharged untreated water to common drain causing pollution of Canoli canal in Kozhikode city. However, no follow up action was taken by DPCB Kozhikode to ensure that the establishments resorted to corrective action.



Waste dumped in open drain alongside National Highway in Thiruvananthapuram Corporation (August 2022)

Government stated in the exit conference (May 2022) that it would ensure that the institutions responsible for managing waste execute their functions and open drain discharge gets regulated and checked through stern action.

### 3.2.1.2 Collection of waste from Poultry stalls/Slaughter houses

As per SWM Rules 2016, daily collection of poultry waste was the responsibility of local bodies. However it was observed that only three test-checked ULBs<sup>56</sup> had a system in place for collection and disposal of poultry waste. During JPV conducted in 25 poultry stalls, 14 meat stalls and two slaughter houses, Audit noticed that poultry waste was given to private agencies/pig farms in 13 ULBs<sup>57</sup>. In three ULBs, the collection of poultry waste by authorized agencies was only up to 50-60 per cent of daily generation. Rest of the poultry waste was either collected unauthorisedly by pig farms or was being dumped in public places or water bodies. Audit scrutiny of log books of JCBs owned by Thiruvananthapuram Corporation revealed that poultry waste dumped in public places were buried at the spot using JCBs, in 49 instances during 2020-21. This would degrade the environment and cause health hazards

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<sup>55</sup>Thiruvananthapuram, Kozhikode, Kochi Corporations, Kayamkulam, Mavelikkara, Neyyattinkara, Vadakara, Koyilandy, Angamaly, Aluva, Maradu, Kothamangalam, Eloor, Muvattupuzha, Manjeri, Malappuram, Parappanangadi, Nilambur, Nedumangad and Feroke Municipalities

<sup>56</sup> Thiruvananthapuram and Kozhikode Corporations and Feroke Municipality

<sup>57</sup>Kayamkulam, Mavelikkara, Parappanangadi, Nilambur, Manjeri, Eloor, Angamaly, Aluva, Kothamangalam, Maradu, Muvattupuzha, Neyyattinkara, Nedumangad

to residents in the vicinity. Further, supply of waste containing untreated meat products to pigs could result in creating potential health hazards to the animals as well as risk of transmission of foreign animal diseases and other pathogens to human beings.

Though Government stated in reply (May 2022) that arrangements with animal farms, fish food manufacturing units, chicken rendering plants, etc. have been made to remove biodegradable waste in the case of markets without composting facilities, no documentary evidence for the same was furnished to Audit by the selected ULBs.

### ***Defective monitoring of functioning of poultry stalls by Pollution Control Board***

As per the guidelines issued (October 2021) by GoK for licensing of poultry stalls, poultry/meat stalls shall enter into agreement with licensed/authorised rendering plants<sup>58</sup> existing within the district or in the nearby district, if plants are not available in the district.

Audit noticed that District PCBs, while granting consent to operate chicken stalls did not ensure that the occupier has valid agreement with licensed rendering plants. The poultry units were classed under orange category of classification of Industrial sectors, which made it mandatory for PCB to conduct inspection of these units at least once in a year. The PCB, without conducting any periodical inspection to ascertain the quality of waste disposal mechanism in these poultry stalls, renewed their consent for five years. During JPV in 16 ULBs, in the absence of liquid waste treatment facility, untreated liquid waste was seen discharged directly to soil and nearby public drains. Such instances of unhygienic disposal of poultry waste could have been arrested by timely interventions of authorities.

At present, there are only 12 rendering units in the State, with an overall capacity of 372 TPD, which is sufficient to process only 34 *per cent* of total poultry waste generated.

Government accepted the audit observations and informed during the exit conference (May 2022) that strict instructions have been given to local bodies to insist that poultry stalls enter into agreement with rendering plants. It was also stated that action was afoot to set up rendering plants in all districts.

### ***Slaughter house waste***

Rule 3(1) of Prevention of Cruelty to Animals (Slaughter house) Rules, 2001, stipulates that no person shall slaughter any animal within a Municipal area except in a slaughterhouse recognized by the authority concerned. The Kerala Municipality Act stipulates that every Municipality shall provide sufficient number of places for Municipal slaughter houses and make necessary arrangements to maintain the municipal slaughter houses in hygienic manner.

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<sup>58</sup> Anaerobic digestion of poultry related waste consume time and some waste materials like feathers could not be processed in the system. Rendering is the approved technology for processing slaughter waste and poultry waste including feathers.

As per data furnished by the District Animal Husbandry Officers, there were 72 slaughter houses in the 22 test-checked ULBs, of which none had authorisation of PCB to function. Average production of slaughter waste in the test-checked ULBs was 6.12 tonnes per day. Absence of authorised slaughterhouses in the ULBs would provide scope for illegal slaughtering in unhygienic manner within the urban limits.



Visceral waste from slaughterhouse discharged into drains in Neyyattinkara Municipality (September 2021)

### 3.2.2 Collection of domestic hazardous waste

As per Rule 15(i) of SWM Rules, ULBs shall establish waste deposition centres for domestic hazardous waste<sup>59</sup> and issue direction to waste generators to deposit domestic hazardous waste at these centres to enable their safe disposal. Bio-medical Waste Management Rules, 2016 stipulate that ULBs shall have tie up with the Common Bio-medical Waste Treatment and Disposal Facility to collect domestic hazardous waste from waste deposition centres/Material Recovery Facility (MRF) or directly from the households for final disposal.

- It was noticed that local bodies render palliative home care services to persons with complex, chronic or acute, life-threatening/life-limiting health conditions as well as bedridden persons. During the period 2016-2021, test-checked ULBs spent ₹13.50 crore towards implementation of palliative care projects for 14185 patients, which included purchase of equipment and medicines, disposable items such as catheters, urine bags, syringes, gloves, ryles tubes, etc. As such ULBs were aware of the significant load of bio-medical waste generated in palliative care households. However, no action was seen taken by 13 test-checked ULBs<sup>60</sup> to collect bio-medical waste generated from such households. The remaining ULBs replied to Audit that they handed over such waste to hospitals in the vicinity for onward transmission to processing sites.
- The test-checked ULBs did not establish waste depositing points/centres to enable depositing and collection of domestic hazardous waste. Consequently, instances of dumping of domestic hazardous waste on road sides and public places were noticed during JPVs in test-checked ULBs<sup>61</sup>, which contributed to environmental and health hazards.

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<sup>59</sup>Domestic hazardous waste includes discarded paint drums, pesticide cans, CFL bulbs, tube lights, expired medicines, broken mercury thermometers, used batteries, used needles and syringes, contaminated gauze, etc. generated at the household level.

<sup>60</sup>Kozhikode, Thiruvananthapuram Corporations, Vadakara, Eloor, Aluva, Maradu, Kothamangalam, Angamaly, Muvattupuzha, Mavelikkara, Kayamkulam, Nedumangad and Neyyattinkara Municipalities

<sup>61</sup> Kochi Corporation and Neyyattinkara, Eloor, Aluva Municipalities

### 3.2.3 Collection of sanitary waste

Sanitary waste comprises of used diapers, sanitary towels or napkins, tampons, condoms, incontinence sheets and any other waste of similar nature. Audit observed that the test-checked ULBs did not collect sanitary waste or set up community level disposal facility for sanitary waste. In the absence of a system in place for regular collection of sanitary waste, instances of mixing of sanitary waste with solid waste occurred, which made segregation extremely difficult, besides contributing to open burning of plastic and sanitary waste, which was environmentally hazardous.

During the exit conference (May 2022), Government accepted the audit finding and stated that at present there is no system or strategy for management, collection and disposal of domestic hazardous waste and sanitary waste. A pilot study has been conducted in some panchayats in and around Ernakulam, based on which guidelines for collection and disposal of domestic bio-medical waste including sanitary waste have been issued (May 2022).

Urgent action needs to be initiated to facilitate collection and disposal of sanitary waste in ULBs.

#### **Environmental pollution due to non-collection of waste from Railway Station**

Thiruvananthapuram Central Railway Station entered (September 2020) into Memorandum of Understanding with CKCL for operation and maintenance of Resource Recovery Facility for waste treatment and disposal at the railway station. As the bio-composter machine was not functional, the segregated biodegradable waste was bundled and dumped outside the Facility, which led to foul smell and oozing of leachate from the heaped waste. The Railway authorities stated that these biodegradable waste would be lifted and transferred to the landfill of KEIL by CKCL. However, verification of records in CKCL revealed that the waste was buried by CKCL in private lands at Paliyode in Thiruvananthapuram district<sup>62</sup>. The agency which was entrusted with effective management of waste itself resorting to such unscientific methods of disposal, was not justifiable.

Further, Audit observed that the work of the Effluent treatment plant to process the liquid waste generated in the railway station and depot area has not been completed. As the plant has not been made functional yet, liquid waste generated is being drained into the Amayizhanjan Thodu, a canal passing underneath the Railway compound. The draining of liquid waste along with plastic waste thrown into the canal, has polluted the water body, besides posing risk of urban flooding during rainy season.

### 3.3 Transportation

The MSWM Manual stipulates a well synchronized primary and secondary collection and transportation system, with regular and well communicated

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<sup>62</sup> The MSWM Manual requires the Municipal authorities to direct waste generators not to litter/throw/dispose any waste or burn or bury waste on streets, open public spaces, drains, etc. and to segregate waste at source and hand over segregated waste to authorised waste pickers/waste collectors

intervals of operation to avoid overflow and littering of waste. Further, the vehicles for transport are to be easy to maintain and compatible with the equipment design at the waste storage depot and capable of transporting segregated waste. Audit observed that as the ULBs did not attempt a scientific assessment of generation and collection of waste, no realistic assessment of requirement of vehicles could be made by the ULBs.

The vehicles used for transportation were to be covered and waste not made visible to public. Proper care should be taken to prevent spillage of waste and leachate en-route to the processing or disposal facility. Depending on the local conditions and location of processing site, ULBs use different types of vehicles such as pushcarts, auto tippers, tipper trucks and compactors for collection and transportation of waste.

### 3.3.1 Use of vehicles without partition/open vehicles

Source segregation would be successful only when the segregated streams of waste do not mix with each other at any stage of transportation, while being taken to the respective processing or disposal facility. In test-checked ULBs, open vehicles were used for transporting waste in seven ULBs<sup>63</sup>, leading to spillage and littering en-route. Out of the different types of vehicles used for waste transportation in the selected ULBs, only 35.24 *per cent* of vehicles had partition and 58.13 *per cent* of vehicles were not in operation due to various reasons such as repair works, loss of fitness, etc.

In reply, Government stated (May 2022) that existing open vehicles were being replaced with covered vehicles and that availability of GPS will be ensured in vehicles engaged in transportation of waste.

### 3.3.2 Idling of own vehicles and hiring of private vehicles for transportation of waste

- Kochi Corporation is in possession of 97 vehicles for waste removal. Of these, 66 vehicles<sup>64</sup> were kept off road during the five year period covered in Audit. The prime reason for the idling of vehicles was delay in obtaining fitness certificates, which ranged from four to 74 months. Audit observed that in addition to procedural delays, there was considerable time lag in receiving approval from Health Standing Committee/Council of the ULBs, rectification of defects by the contractor, etc. As of March 2022, the period of delay in the case of Covered tippers ranged upto 15 months, Compactors upto 23 months, JCB upto 41 months, Mini JCB upto 62 months and Ape trucks upto 74 months. These vehicles still continue to be off road for want of clearance regarding fitness. The Corporation incurred ₹27.53 crore during 2017-2021, towards hiring of vehicles for waste transportation.

Concurrently, the Corporation hired on an average 44 vehicles until July 2020, by executing agreement for payment ranging from ₹450/tonne to ₹2100/tonne for solid/plastic waste. The agreement was modified with

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<sup>63</sup>Kochi, Thiruvananthapuram Corporations and Aluva, Kothamangalam, Muvattupuzha, Nedumangad, Neyyattinkara Municipalities

<sup>64</sup>Nine compactors, three JCBs, 14 Covered tippers, 37 Ape trucks, one Open tipper and two Vans

effect from July 2020 and each vehicle was hired by paying upto ₹4850/vehicle/day.

Government replied (May 2022) that procedures adopted for obtaining fitness such as approval of Standing Committee/Council, inviting quotation for repair of vehicles, obtaining approval of Committee and Council for making payment, etc. resulted in the delay in obtaining fitness clearance. The reply is not justifiable as Corporation could have proactively intervened to minimise procedural delays, which resulted in keeping vehicles off the road for a considerable period. Also, ULBs incurring substantial amount of funds for hiring vehicles while their own vehicles were kept off the road due to avoidable administrative delay is not an acceptable trend.

- Thiruvananthapuram Corporation owned 120 vehicles, of which 107 vehicles were purchased during the period from 2006 to 2010 for door-to-door collection and transport of biodegradable waste to Vilappilsala windrow composting plant. Since the closing down of the plant in December 2011, the Corporation promoted source level processing of biodegradable waste and utilised vehicular transport only for street sweepings and littered waste and for shifting plastic waste from MCFs to RRFs. Audit observed that of the 29 tipper lorries purchased by the Corporation within five years of closure of Vilappilsala plant, 13 tippers were not utilised from March 2015 till March 2022. Of the remaining 16 tippers, only three were utilised regularly, thereby leading to nil/underutilisation of 26 vehicles. Of these, 13 vehicles were not used for a period of seven to 10 years. The average yearly utilisation of the remaining vehicles ranged from seven to 44 days during the five-year audit period. The Corporation conducted (April 2022) auction of 12 tippers of which only eight tippers could be disposed of, fetching around ₹ two lakh/tipper.

The Corporation, instead of retaining nearly 26 vehicles without actual use, could have handed over these vehicles to ULBs like Kochi Corporation, where 40-50 tippers were being hired per day. This would have avoided idling of vehicles and loss of public money.

***Recommendation 6: Government must ensure that ULBs adopt effective strategies for segregation of waste at various levels, viz., source/ household, centralised sorting facility and waste processing sites, door-to-door collection of domestic hazardous waste and sanitary waste and provide separate colour coded bins at public places to enable effective segregation and collection of waste.***

***Recommendation 7: Government/ULBs must ensure that a realistic assessment of vehicles used by ULBs for transportation of waste is undertaken. Urgent action needs to be initiated for executing maintenance/repair works of vehicles, to limit hiring of vehicles while keeping own vehicles off the road for prolonged periods.***