Solid Waste Management Initiatives - Kerala

Local Self Government Department

Government of Kerala
Waste Generation in the State

Total MSW generation in Kerala is 3.7 Million Tons annually

WASTE GENERATED BY LSGIS IN TPD

- 941 GPs, 4106, 41%
- 87 Municipalities, 4523, 45%
- 6 City Corporations, 1415, 14%

<table>
<thead>
<tr>
<th>Local Self Government Institution</th>
<th>Nos</th>
<th>Population (Cr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporation</td>
<td>6</td>
<td>0.31</td>
</tr>
<tr>
<td>Municipality</td>
<td>87</td>
<td>0.45</td>
</tr>
<tr>
<td>Grama Panchayat</td>
<td>941</td>
<td>2.58</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>3.34</strong></td>
</tr>
</tbody>
</table>

Based on a comprehensive sectoral status study on solid waste management sponsored by the Water and Sanitation Project- South Asia (World Bank)
Municipal Solid Waste

Waste Generation

- Households: 49%
- Institutions: 36%
- Wayside & Public Places: 15%

Category of Waste

- Biodegradable
- Non-biodegradable
- Inerts

The non-biodegradable waste includes:

<table>
<thead>
<tr>
<th>Material</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>6%</td>
</tr>
<tr>
<td>Plastics</td>
<td>4%</td>
</tr>
<tr>
<td>Metals</td>
<td>1%</td>
</tr>
<tr>
<td>Glass</td>
<td>1%</td>
</tr>
<tr>
<td>Rubber and Leather</td>
<td>2%</td>
</tr>
<tr>
<td>Domestic hazardous materials</td>
<td>0.4%</td>
</tr>
<tr>
<td>Inerts</td>
<td>5%</td>
</tr>
</tbody>
</table>
## State Policy on Solid Waste Management

The policy on solid waste management was published by the State on 13 September 2018 as per Order No. GO(P) No.65/2018/LSGD.

### Contents Include

1. Background
2. Vision
3. Rationale
4. Guiding principle
5. Objectives
6. Strategy
7. Legislative Background
8. Roles and Responsibilities of stakeholders
9. Training and Capacity building
10. Awareness building and Behaviour change education
11. Extended Producer Responsibility
12. Reclamation of old waste dumps
13. Involvement of informal sector
14. Gender equity aspects
15. Monitoring and evaluation
16. Research and Development
17. Conclusion
Salient features of state policy

• Waste considered as a resource
• Emphasis on 3R
• Mandatory segregation at source
• Treatment of biodegradable fraction at source
• Ensure decentralised community facilities for biodegradable wastes that overflow from sources
• Door-to-Door collection of non-biodegradables and ensuring it’s forward linking
• Evolve procedure for domestic hazardous waste

• Modern centralised waste processing (WTE) facilities in major cities
• Develop regional landfill facilities
• Regular sweeping, cleaning and beautification of public places
• Prevent or discourage single use and throw away materials
• Rationalise and strengthen enforcement of rules
• Promote automated grievance redressal system
• Undertake appropriate IEC campaign
• Community monitoring system
• Network with academic and R & D institutions
• Enlarge the service provider domain
<table>
<thead>
<tr>
<th>SN</th>
<th>Duties of waste generators</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 1  | **Issue guidelines for waste generators** (Households/Resident welfare associations/Gated communities/Institutions/Hotels and Restaurants) for ensuring their duties like segregation, storage, processing of biodegradable and non-biodegradable waste | **Complied**            | G.O (Rt) No. 2511/2017/LSGD dated 22.07.2017  
G.O (Rt) No. 2420/2017/LSGD dated 15.07.2017 |
| 2  | **Implement Green Protocol** for giving importance for segregation of waste, reduction in waste generation and usage of reusable materials. | **Complied**            | Continuing activity  
G.O (Rt) No 3214/2017/LSGD dt 5.10.2017 |
<table>
<thead>
<tr>
<th>SN</th>
<th>Duties of <strong>waste generators</strong></th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Biodegradable waste management at <strong>Source.</strong> Household/Institutional/Community level composting and Bio-methanation</td>
<td><strong>Ongoing</strong></td>
<td>100% coverage in 2 years 76.84 % coverage achieved so far at HH level. G.O issued for decentralized management of waste</td>
</tr>
<tr>
<td>4</td>
<td>Non-biodegradable waste management Household/Institutional level <strong>collection, segregation, storage and channelizing for recycling</strong></td>
<td><strong>Ongoing</strong></td>
<td>70-80% coverage before 5/2019</td>
</tr>
<tr>
<td>5</td>
<td>Behavioural change communication for preventing throw, burn or bury solid waste</td>
<td><strong>Ongoing</strong></td>
<td><strong>BCC</strong> Public awareness through print and visual media</td>
</tr>
<tr>
<td>SN</td>
<td>Duties of <strong>State Secretary LSGD in charge of Urban Development, Panchayats</strong></td>
<td>Status</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>2</td>
<td><strong>Ensuring implementation of provision of the rules by LSGIs</strong></td>
<td>Issue based instructions given from time to time</td>
<td>Stage by stage implementation of the rule by local bodies over a period of 6 months to 5 years</td>
</tr>
<tr>
<td>3</td>
<td>Preparation of <strong>Master Plan for cities by Town Planning Department</strong></td>
<td>Initiated</td>
<td>100 % by 2 years Actions initiated for preparation of MP in 93 ULbs</td>
</tr>
<tr>
<td>4</td>
<td>Identification of suitable land for setting up solid waste processing and disposal facilities</td>
<td>Initiated</td>
<td>Land identified in 8 major cities for setting up centralised facility</td>
</tr>
<tr>
<td>SN</td>
<td>Duties of <strong>State Secretary LSGD in charge of Urban Development, Panchayats</strong></td>
<td>Status</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>5</td>
<td>Direct developers to earmark land area for recovery and recycling facility</td>
<td>Complied</td>
<td>Sites identified and notified by Kerala State Industrial Development Corporation &amp; KINFRA Information available in Suchitwa Mission website</td>
</tr>
<tr>
<td>6</td>
<td>Facilitate establishing common regional sanitary landfill</td>
<td>Initiated</td>
<td>District Collectors have been directed to identify suitable lands as per SWM Rules 2016.</td>
</tr>
<tr>
<td>7</td>
<td>Arrange for capacity building for local authorities</td>
<td>Ongoing</td>
<td>Continuing activity</td>
</tr>
<tr>
<td>8</td>
<td>Start a scheme on registration of waste pickers and waste dealers</td>
<td>Complied</td>
<td>Complied and details available in Suchitwa Mission website. Identity cards to be issued</td>
</tr>
<tr>
<td>SN</td>
<td>Duties of District Collector</td>
<td>Status</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Facilitate identification of suitable land for setting up solid waste processing and disposal facilities</td>
<td>Ongoing</td>
<td>Land have been identified for setting up common treatment facilities in 8 places</td>
</tr>
<tr>
<td>2</td>
<td>Review performance of local bodies on waste management and take corrective measures</td>
<td>Ongoing</td>
<td>Continuing through district level project reviews</td>
</tr>
<tr>
<td>SN</td>
<td>Duties and Responsibilities of Grama Panchayats and Urban Local Bodies</td>
<td>Status</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------------</td>
<td>------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Preparation of <strong>Solid Waste Management Plan</strong></td>
<td>Complied</td>
<td><strong>SWM plan in place. It is mandatory to earmark 10 &amp; 15 % of plan fund respectively for Panchayats and ULBs</strong></td>
</tr>
<tr>
<td>2</td>
<td>De-centralized Biodegradable Waste Management at Source Household/Institution/Community/Market Level Composting &amp; Bio-methanation</td>
<td>Ongoing as part of HKM activities</td>
<td>Presently about 20% coverage in Urban areas and 80-100 % coverage in 3 year. In Grama Panchayats (GPs) 80% of Households doing composting in traditional compost pits</td>
</tr>
<tr>
<td>SN</td>
<td>Duties and Responsibilities of Grama Panchayats and Urban Local Bodies-Non-biodegradable Waste Management</td>
<td>Status</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>3</td>
<td>Facilitate formation of entrepreneur groups (SHGs, NGOs etc) and branding</td>
<td>Ongoing</td>
<td>Formation of sufficient groups as per requirement in 1 year as part of HKM activities</td>
</tr>
<tr>
<td>5</td>
<td>Segregation and door to door collection</td>
<td>Ongoing</td>
<td>100 % Coverage in 1 year</td>
</tr>
<tr>
<td>6</td>
<td>Establishment of MRFs with different capacity at different levels in all Grama panchayats and Urban Local Bodies based on number of households</td>
<td>Ongoing</td>
<td>100 % Coverage in 1 year</td>
</tr>
<tr>
<td>7</td>
<td>Formalize the informal sector of waste pickers, collectors, scrap dealers etc.</td>
<td>Ongoing</td>
<td>Complied and details available in Suchitwa Mission website. Stakeholder discussion conducted. Identity cards to be issued</td>
</tr>
<tr>
<td>SN</td>
<td>Duties and Responsibilities of Grama Panchayats and Urban Local Bodies</td>
<td>Status</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Developing system for Domestic Hazardous waste Management including collection, transportation and disposal as per rules</td>
<td>Initiated</td>
<td>Collection and transportation managed through Clean Kerala Company Ltd. Disposed through hazardous waste landfill at Kochi</td>
</tr>
<tr>
<td>9</td>
<td>Developing system for <strong>Construction &amp; Demolition Waste Management</strong> including collection, transportation and disposal as per rules</td>
<td>To be achieved in 5 years</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><strong>Preparation of by laws</strong> incorporating provisions in this rule including spot fine for littering and failing to comply with provisions of the rules</td>
<td>Complied</td>
<td>By-laws prepared. Being reviewed at Government level</td>
</tr>
<tr>
<td>11</td>
<td><strong>Prescribing user fee</strong> for collection of waste from waste generators</td>
<td>Complied</td>
<td>G.O (Rt) No. 2420/2017/LSGD dated 15.07.2017</td>
</tr>
<tr>
<td>SN</td>
<td>Duties and Responsibilities of <strong>Grama Panchayats and Urban Local Bodies</strong></td>
<td>Status</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>13</td>
<td>Issue direction preventing littering and burning of waste on streets, public spaces, drain, water bodies etc</td>
<td>Complied</td>
<td>Executive directive issued through Police Department against dumping and burning of waste on 14.11.2016 Ordinance for preventing waste dumping in water bodies issued dated 8.12.2017</td>
</tr>
<tr>
<td>14</td>
<td>Trainings for waste collectors, entrepreneur groups and other stakeholders</td>
<td>Ongoing</td>
<td>Continuing activity</td>
</tr>
<tr>
<td>15</td>
<td>Management of street sweeping waste in Urban area</td>
<td>Ongoing</td>
<td>Managed at community level-aerobic bins</td>
</tr>
<tr>
<td>16</td>
<td>Forward linkaging of composting with organic farming and horticulture etc</td>
<td>Ongoing</td>
<td>Haritha Kerala Mission Activities-organic vegetable cultivation</td>
</tr>
<tr>
<td>SN</td>
<td>Duties and Responsibilities of Grama Panchayats and Urban Local Bodies</td>
<td>Action Taken</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------------</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>17</td>
<td>Construction, Operation and Maintenance of Sanitary Landfill at regional level as per the provision in the rules</td>
<td>Initiated</td>
<td>To be achieved in 3 years District Collectors have been directed to identify suitable land as per SWM Rules 2016</td>
</tr>
<tr>
<td>18</td>
<td>Provision in budget for SWM activities</td>
<td>Complied</td>
<td>15% (for Urban Local Bodies) and 10% (for Rural Local Bodies) of Plan Fund earmarked for SWM Projects, additional State Fund has also been granted</td>
</tr>
<tr>
<td>19</td>
<td>Obtain sanctions from State PCBs where ever applicable</td>
<td>Concurrent activity</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Create public awareness</td>
<td>Initiated</td>
<td>Continuing activity through print, outdoor, mass, mid and social media</td>
</tr>
<tr>
<td>SN</td>
<td>Duties and Responsibilities of Grama Panchayats and Urban Local Bodies</td>
<td>Action Taken</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>21</td>
<td>Ensuring PPE and Uniforms for persons engaged in handling solid waste</td>
<td>Initiated</td>
<td>Continuing activity</td>
</tr>
<tr>
<td>22</td>
<td>Ensuring incorporation of centres for collection, segregation and storage of segregated waste in building permit plan of a group of housing society or market complex</td>
<td>Complied</td>
<td>Actions initiated by amending the Kerala Municipality Act. Executive orders issued for early compliance.</td>
</tr>
<tr>
<td>23</td>
<td>Ensuring Solid Waste Management in Hilly area as per the rules</td>
<td>Initiated</td>
<td>Decentralized system of waste management is being promoted in compliance with rules</td>
</tr>
<tr>
<td>24</td>
<td>Bioremediation or Capping of old and abandoned dump sites</td>
<td>Initiated</td>
<td>Competent agencies identified for execution of projects. To be achieved in 5 years</td>
</tr>
<tr>
<td>SN</td>
<td>Formation of State Level Advisory Body</td>
<td>Action Taken</td>
<td>Remarks</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>Committee formation</td>
<td>Complied</td>
<td>G.O issued vide G.O (Rt) No. 140/2018/LSGD dt 16.01.2018</td>
</tr>
</tbody>
</table>

- Suchitwa Mission Prepared Draft Action Plans as per SWM Rules 2016 for all the 93 ULBs and have made available to them for submission to state PCB after approval by the respective councils
- 46 ULBs already submitted the plans to PCB
State strategy on Waste Management

• Kerala has adopted a different approach of decentralized system of waste management without deviating from the provisions in the Solid Waste Management Rules 2016

• Clause 15 (v) of SWM Rules –under Duties & responsibilities of local authorities says preference shall be given to decentralized processing to minimize transportation cost and environmental impacts
The possibility of identifying most suitable modern technology for big cities is also being taken up to manage the overflow waste.

Source level segregation and treatment of biodegradable waste is promoted at Source level (Household/Institutional/Community Level).

The biodegradable fraction is treated at the source level through composting and biomethanation (Biogas plants).
SOURCE LEVEL COMPOSTING OF BIO-DEGRADABLES – HOUSEHOLD LEVEL

- Devices of various capacities distributed to households to manage kitchen waste
COMMUNITY/INSTITUTIONAL LEVEL COMPOSTING OF BIODEGRADABLES

- Aerobic bins, Biogas plants, Organic Waste Converters for housing colonies, apartment complexes and public places like markets

Organic waste converter  Portable biobins  Biogas plants  Aerobic bins
### WASTE MANAGEMENT – PROGRESS SO FAR

| **• 1,39,851 biogas plants at households** |
| **• 1320 biogas plants at institutions** |
| **• 98 biogas plants at community level** |

| **• 314205 composting plants at HH level** |
| **• 29420 composting plants at institutions** |
| **• 2003 composting plants at community level** |
| **• About 30 lakh composting pits** |
| **• 10 centralized composting plants** |

| **• 399 Material Collection Facilities (MCFs)** |
| **• 88 Resource Recovery Facilities (RRFs)** |
| **• 106 Plastic shredding units** |

---

**Total waste generation in Kerala is ~ 9000 tpd. About 50% of the biodegradable waste generated is handled through these systems.**
DOOR TO DOOR COLLECTION OF NON-BIODEGRADABLES

❖ Harithakarmasena (HKS) formed in 1028 LSGIs out of 1034
❖ 26358 trained HKS by the Kudumbasree Mission
❖ 355 HKS units operational for door-to-door collection of non-biodegradables

Haritha Karma Sena (HKS) or Green Task Force - a Micro Enterprise Unit formed in each LSGI with 2 persons in each ward to do door to door collection of non-biodegradable waste & assist in biodegradable waste management by charging a user fee (~Rs.60/- Rs. 800/- depending on services provided)
COLLECTION AND STORAGE OF NON-BIODEGRADABLES FOR RECYCLING

- Secondary storage of non-biodegradables in Material Collection Facility (MCF) Centres
- **399 MCF** established
- Non-biodegradables from MCF moved to Resource Recovery Facility (RRF) in Block Panchayats, Municipalities and Corporations
RECYCLING OF NON-BIODEGRADABLE WASTE

- 88 RRFs functional on a cluster basis; 175 more needed
- Non biodegradables segregated for shredding and bailing for recycling
- 106 functional plastic shredding units
SHREDDED PLASTICS USED FOR ROAD TARRING

277 tonnes of shredded plastics handed over to Local bodies and PWD for road tarring till 18.11.2018
<table>
<thead>
<tr>
<th>S.N</th>
<th>District</th>
<th>Village</th>
<th>Extent (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thiruvananthapuram</td>
<td>Peringamala</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Thrissur</td>
<td>Aranattukara</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Palakkad</td>
<td>Puthussery Central</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Kozhikode</td>
<td>Cheruvannur</td>
<td>12.67</td>
</tr>
<tr>
<td>5</td>
<td>Kannur</td>
<td>Chelora</td>
<td>9.7</td>
</tr>
<tr>
<td>6</td>
<td>Kollam</td>
<td>Thrikkadavoor</td>
<td>7.05</td>
</tr>
<tr>
<td>7</td>
<td>Malappuram</td>
<td>Panakkad</td>
<td>10</td>
</tr>
<tr>
<td>S.N</td>
<td>Project site</td>
<td>Status</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| 1   | Peringamala, Thiruvananthapuram | • 15 acres of land under the possession of Agriculture Department identified for the Project.  
• KSIDC has taken steps to take the land on lease |
| 2   | Lalur, Trichur                | • 15 acres of land under the possession of Trichur Municipal Corporation identified for the project.  
• KSIDC has taken steps with Trichur Municipal Corporation to take the land on lease |
<table>
<thead>
<tr>
<th>S.N</th>
<th>Project site</th>
<th>Status</th>
</tr>
</thead>
</table>
| 3   | Kanjikode, Palakkad Processing capacity 200 TPD | • 11 acres of land under the possession of Industries Department identified  
• Survey and demarcation completed  
• KSIDC has taken steps with Industries Department to take the land on lease  
• The tender documents ready -to be floated by 31st January 2019. |

The Palakkad cluster comprises Palakkad, Chittur-Thattamangalam, Ottappalam, Shornur Municipalities & Mannarkkad, Pattambi and Puthusserry Grama Panchayath
<table>
<thead>
<tr>
<th>S.N</th>
<th>Project site</th>
<th>Status</th>
</tr>
</thead>
</table>
| 4   | Njalianparambu, Kozhikode                | • Identified 12.67 acres under the possession of Kozhikode Municipal Corporation at Njalianparambu  
• KSIDC executed Lease Agreement with Kozhikode Municipal Corporation to handover the land to KSIDC  
• The RFP floated on 22\textsuperscript{nd} November 2018 and 31\textsuperscript{st} January 2019 is the last date                                                                                           |
|     | Processing capacity- 300 TPD             |                                                                                                                                                                                                                                                                                                                                                                                                |
|     | Expected power generation - 5 MW         |                                                                                                                                                                                                                                                                                                                                                                                                |

**MSW generated in Kozhikode Municipal Corporation, Faroke, Quilandy, Ramanattukara Municipalities and Olavanna, Kadalundi, Kunnamangalam Gramapanchayaths will be processed at Njalianparambu**
<table>
<thead>
<tr>
<th>S.N</th>
<th>Project site</th>
<th>Status</th>
</tr>
</thead>
</table>
| 5   | Chelora, Kannur     | • 9.7 acres oaf land under the possession of Kannur Municipal Corporation identified  
• KSIDC has taken steps with Kannur Municipal Corporation to take the land on lease  
• The Tender documents under preparation.                                           |
| 6   | Kureepuzha, Kollam   | • 200 TPD will be the processing capacity of the plant  
• 7.05 acres of land under the possession of Kollam Municipal corporation at Kureepuzha identified  
• KSIDC has executed Lease Deed with Kollam Municipal Corporation  
• The tender documents for Kollam Waste to energy project under finalization - RFP expected to be floated by 31<sup>st</sup> Jan 2019.  
• The Kollam cluster comprises the following LSGIs |

Kollam Municipal Corporation, Paravur, Kottarakkara, Karunagappally and Punalur Municipalities & Thrikkadavoor Gramapanchayath comes under Kollam Project
<table>
<thead>
<tr>
<th>S.N</th>
<th>Project site</th>
<th>Status</th>
</tr>
</thead>
</table>
| 7   | Panakkad, Malappuram  | • 10 acres of land under the possession of KSIDC identified for the project.  
|     |                       | • Survey and demarcation completed.                                   
|     |                       | • The tender documents for Malappuram waste to energy project under preparation. |

- In addition to the sites mentioned an agreement has already been reached with a concessionaire to set up and **operate a plant to produce 10 MW from waste in Kochi**. Environment clearance for the project is awaited.

- Also, a **5 TPD plant for power generation, based on bio-methanation, is under construction at Sultanbathery Municipality in Wayanad district.**
Legal interventions

- Steps have been initiated to implement by-laws as per SWM Rules 2016 by Grama Panchyats, Municipalities and Municipal Corporations.
- As per G.O (Rt) No. 2511/2017/LSGD dated 22.07.2017 Government has issued strict instructions to ensure at source management of waste (segregation, storage, processing of biodegradable and non-biodegradable waste) at critical institutions like hotels, clubs, marriage halls, malls, retail shops, cinema halls, textile shops, catering units, food serving destinations vegetable markets, fruit stalls, fish stalls, meat stalls, canteens etc.
The D&O licensing system has been linked up with the availability of facility for waste management.

The provisions in related sections under Kerala Municipality Act 1994 is once again reinforced for penalizing those who violate the rules.

Green protocol is being strictly promoted in Government offices and institutions and the Government have also issued an order in this regard (G.O.(Rt)No.3214/2017/LSGD,dt 5.10.2017).
1 North Paravur Municipality, Ernakulam
2 Kunnamkulam Municipality, Thrissur
3 Attingal Municipality, Trivandrum
4 Alappuzha Municipality
~ 10 Tons of waste generated/day

• Street sweeping: in the main roads on a daily basis and in by-roads once in two days

• 50 sanitary workers of the municipality engaged in road sweeping, primary collection and transportation of solid waste

• Collected bio waste transported to the vermi compost plant situated at vedimara.

• 6 workers per ward (Haritha Karma Sena) engaged through National Rural Employment Guarantee Scheme (NREGS) do door to door collection and sweeping of roads on a daily basis
Managing biodegradable waste

- Each household is given pipe composting unit at a subsidised rate
- Bio-degradable waste from hotels and commercial establishments collected on payment basis and transported to the processing plant at Vedimara
- 1.5 TPD Capacity windrow compost plant for aerobic composting at Vedimara
- The compost generated is sold as fertilizer
Managing Non-biodegradables

- Non-biodegradable waste from households & institutions collected by Haritha Karama on an user fee basis (80% of households & institutions are covered)
- The collected NBW are handed over to ANNA plastics, with whom an agreement is executed
- Non-biodegradable waste including plastic waste is collected from commercial and market places by the Municipality directly
- Plastics, collected bimonthly or once in a week, from the commercial and market places are shredded and given for road tarring and the bailed plastic is send for recycling
The North Paravur Municipality is declaring 10 wards as ‘Zero waste on ground’ on 30th January 2019
Kunnamkulam Municipality, Thrissur

37 wards, 54071 population

- For the last one-year Kunnamkulam Municipality has been successfully implementing Bio-waste management.
- **It successfully integrates different agencies** like IRTC (Integrated Rural Technology Centre), Kudumbasree Self Help Groups, and the concerned waste producers.
- **Bio wastes from the residential sector are being treated at source using bio-bins** supplied by the Municipality.
• Around 3000 bio-bins already supplied by the ULB.

• Green army volunteers help people maintain these bio-bins.

• **13156 households follow source level treatment of bio waste** and are helped by the volunteers

• The segregated bio-wastes from the city is collected and transported to the centralized bio-waste plant of the Municipality situated at ‘Kurukkanpara’.

• These bio wastes weighing around 3 tons per day is treated and converted to bio manure
• Mechanization and the required infrastructure of the plant are funded under the decentralized plan of the LSGI

• Labour is supplied by a Kudumbasree micro entrepreneur group called ‘Samatha’

• The **bio manure is sold to the local farmers**

• Technical support is given by IRTC, a non-profit organization registered in Kerala empaneled for implementing waste management systems across the state.
Non-Bio degradable Waste Management

- Kunnamkulam Municipality consists of 37 wards in which average number of households is 350 to 400
- Each municipal ward has two members of Harithakarma Sena - engaged in household non-bio degradable waste collection
- Waste collection is conducted once in a month by these members of ULB collecting a user fee of Rs.60/- per month.
• Non-bio degradable wastes from the commercial buildings of the town are collected by a separate plastic collection team four times a month.

• Five Kudumbasree members are engaged in this activity.
Kudumbasree members also actively participate in the conservation of ponds, natural drains etc.
Green Park, Kurukkanpara, Kunnamkulam Municipality (Solid waste management plant) operated and maintained by SHG, Samatha Green
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area</strong></td>
<td>16.87 Sq.KM</td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td>37382 Male – 17551, Female -19831</td>
</tr>
<tr>
<td><strong>Wards</strong></td>
<td>31</td>
</tr>
<tr>
<td><strong>Total Waste generated per day</strong></td>
<td>16 tons</td>
</tr>
<tr>
<td><strong>Treatment methods adopted- centralised treatment</strong></td>
<td>Vermin Compost Plant, Windrow Compost Plant, Bio Methanation</td>
</tr>
<tr>
<td><strong>Extend of Land For SWM</strong></td>
<td>4.39 acres</td>
</tr>
</tbody>
</table>
Attingal Municipality- Centralised SW treatment plant

<table>
<thead>
<tr>
<th>Area</th>
<th>4.39 acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total waste Generation</td>
<td>16 TPD</td>
</tr>
<tr>
<td>Processing Technologies</td>
<td>Vermi, Windrow, Biomethanisation</td>
</tr>
<tr>
<td>Built up Area</td>
<td>1400 m²</td>
</tr>
<tr>
<td>Vermi Composting Unit</td>
<td>200 m²</td>
</tr>
<tr>
<td>Windrow Composting Unit</td>
<td>1200 m²</td>
</tr>
<tr>
<td>Capacity of Biogas Plant</td>
<td>370 m³ (4 nos)</td>
</tr>
<tr>
<td>Vermi Composting- Processing</td>
<td>0.5 TPD</td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
</tr>
<tr>
<td>Windrow Composting- Processing</td>
<td>13 TPD</td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
</tr>
<tr>
<td>Biogas Plant - Processing Capacity</td>
<td>1.2 TPD</td>
</tr>
</tbody>
</table>

Kudumbasree units collect waste daily from 4300 houses and 600 institutions.
Treatment plant at Chudukadu, Attingal Municipality
Windrow Composting

Matured Windrow Compost

Secondary sieve

Pulveriser

Ready to sale compost

Finished compost sold @ Rs.10/kg
Biogas plant for leachate treatment at chudukadu centralised treatment plant, Alappuzha Municipality
Vermin compost plant, Attingal Municipality

Labours at work

Cow dung mixed waste for semi de-composting

Ready to use vermin compost

Finished compost sold @ Rs.15/kg
Non bio degradable management

- The segregated non recyclable waste are shredded at the plastic shredding unit at the centralised plant and handed over to Clean Kerala Company
- Recyclables are stored at the MCF and handed over to recycling agencies
- Carry bags below 50 microns are banned
Green belt preserved around the treatment plant, Attingal Municipality
• State Pollution Control Board Award for best practice 2006 to 2016 [ 11 Awards ]
• Award for Best Municipality in Kerala 2013
• Swaraj Trophy 2004-05
• CUSAT Award for Best Management 2008
• Sukrutha keralam- Malayala Manorama Award
• ANARA award from UAE 2007, 2009
# Alappuzha Municipality

<table>
<thead>
<tr>
<th>Population</th>
<th>172122</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>46.77 sq.km</td>
</tr>
<tr>
<td>No of Households</td>
<td>42957</td>
</tr>
<tr>
<td>Solid waste generation</td>
<td>58tonne/day</td>
</tr>
</tbody>
</table>
Solid Waste Management in Alappuzha Municipality

• Prior to 2013 waste management was being done at a centralized plant at Sarvodayapuram
• Due to local resistance the plant had to be shutdown in 2010
• A project named “Nirmala Nagaram Nirmala Bhavanam” financially supported by Suchitwa Mission was launched in 2013
• ‘Nirmala Nagaram Nirmala Bhavanam’ project focuses on decentralized waste management
• Domestic biogas plant and pipe compost installed in 12 wards where waste management posed a huge challenge.
• In these wards, the Municipality installed about 2850 biogas plants and 1800 pipe compost units.
• Trained Kudumbasree units are engaged for follow-up and servicing
Non bio degradable management

- Mini Material Collection Facilities are set up in 11 wards of the Municipality.
- The public can hand over the waste on all the days to these MCF.
- Non-bio-degradable waste brought by the public to MCF units other than plastic is handed over to scrap dealers or private agencies.
- Non recyclable plastics are shredded and handed over to Clean Kerala Company for road tarring.
Aerobic bins (Thumburmuzhi composting) installed in various locations in the Municipality for decentralised bio waste management.
Waste management infrastructure in Alappuzha Municipality

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Aerobic units</td>
<td>30</td>
</tr>
<tr>
<td>No. of Aerobic bins</td>
<td>265</td>
</tr>
<tr>
<td>No. of Biogas plants</td>
<td>2850</td>
</tr>
<tr>
<td>No. of pipe compost units</td>
<td>1800</td>
</tr>
<tr>
<td>No. of Material Collection Facility centers</td>
<td>11</td>
</tr>
</tbody>
</table>
WATSAN Park, Alappuzha Municipality

- A permanent Exhibition cum learning centre for environment friendly waste management and water conservation techniques
- Decentralized waste management through aerobic composting is demonstrated here
- Working models of waste management devices exhibited in the Park.
• Centre for Science and Environment, Best Clean City Award 2017, 2018
• Kerala State Pollution Control Board Award 2015, 2015, 2016, 2017, 2018
• UNEP Award 2017 – one among the best five cities in World for waste management
• Kerala State Government Award for energy management 2016, 2017, 2018
Objectives
• To impart knowledge on scientific waste management and sanitation practices
• To bring in behaviour change to adopt and practice scientific waste management practices
• To create an enabling environment which is conducive to better community health/public health

Target group identified
• Households
• Institutions
• Local Body representatives/officials

Communication medium
• Interpersonal communication (one on one)
• One to many- mid media & mass media
• Social media
<table>
<thead>
<tr>
<th>Interpersonal communication</th>
<th>Mass media &amp; mid media (One to many)</th>
<th>Social media</th>
<th>Awards/competitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• House to house campaign by swachagrahis Mahila pradan, kudumbasree workers, NSS volunteers etc</td>
<td>• FM/TV campaigns</td>
<td>• Facebook, twitter and youtube</td>
<td>• Quiz competitions</td>
</tr>
<tr>
<td></td>
<td>• Production and distribution of print materials, news daily advertorials</td>
<td>• Articles in various journals publications like Down to Earth Magazine, Janapadham, gramasri, panchayathiraj etc</td>
<td>• Poster making competitions</td>
</tr>
<tr>
<td></td>
<td>• Phone messages endorsed by celebrities</td>
<td></td>
<td>• Greeting card making competitions for school students</td>
</tr>
<tr>
<td></td>
<td>• Railway jingles, exhibitions, reality shows</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Street plays, folk arts, suchitwa songs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Akashavani

• 30 Episodes on promoting scientific waste management in 6 months’ time (01.05.17 to 30.09.17)
• 60 episodes on promoting scientific waste management practices in 6 months’ time (started from February 2019)

FM jingles

• 2800 jingles on key messages on scientific waste management through Akashawanin and Private FM channels
• Special insertions during Pre-monsoon, Attukal Pongala, FFW
• The 80-episode short film contest in Doordarsan titled “Think Clean” reality show (2016)
• 150 short films in the final round from among 500 entries received
• To sensitize the public on the importance of citizens’ responsibility in sanitation and waste management
• Gathered around 500 short videos that speaks on the theme of waste management
• Bus Branding in State RTC buses
  • Placed messages on 3 sides of 200 the buses for a period of 3 months

• Messages in Cinema Theatres
  • 30 seconds commercials in 438 cinema theatres across the state
• BSNL Out-Bound Dialing
  • Messages to 10 lakh mobile phone users endorsed by celebrities

• 4 Page advertorial in leading Malayalam dailies
  • As part of the Freedom from waste campaign held in August 2017

• Onam Pageantry- float
  • For promotion of scientific waste management practices
• Exhibitions
  • Conducted more than 100 major exhibitions across the state to introduce the method of source composting, demonstrations and promotion of segregation

• Freedom from Waste Campaign
  • Waste management status Survey in all Households (HHs) in the State
  • Campaign for source level waste management through distribution of leaflets- more than 50 lakhs leaflets
  • One to one communication by volunteers in all Households
• TV Channel advertisements with the support of Lotteries department
  • TV Commercials given in all channels for disseminating Source level management (30 sec x 6 insertions per day)

• Railway jingles/display through lit boards
  • Messages on green protocol, sanitation through Jingles and display boards in railway stations
Swachh Survekshan
- Wall paintings, bill boards, messages in local cable TVs etc

Onam Greeting Card competition
- Held greeting card making competition to promote ‘My waste my responsibility’ message among students and parents
- With the support of DPI in all Govt. & Govt. aided schools in the state
- Separate category competition held for LP, UP & HS
• **Swachatha hi seva**
  • Dump site Clearance across the state with the support of Various stake holders
  • Cleaning campaign at public offices and institutions
  • Awareness Programmes like mid-media campaign with the support of NSS units
  • Pledge taking at all major public offices and institutions
Production and dissemination of IEC creatives

• Produced 20 Videos on various aspects of scientific waste management – social media/TV campaigns

• Audio Jingles – for disseminating through FM/ Railway

• Audio News clips for social media dissemination

• Take away materials printed and disseminated
Harithakeralam anniversary celebrations

• Demonstrations, exhibitions held in all districts/state levels
• Mutual learning and sharing workshop held in KILA on best practices on waste management
• Documented model initiatives of LSGIs in waste management and being used as training handbook
‘Clean campus Green campus’

- A project through NSS to make the colleges, higher secondary schools and adopted wards of NSS units ‘waste-free’

- Camps have been held in the adopted villages throughout the state by NSS volunteers to make it ‘waste free’

- 1828 NSS units and around 20000 volunteers part of the campaign
Clean campus Green campus: Activities

• Cleaning a dumpsite and turning the garbage site into a garden
• Cleaning water sources
• House visits and pamphlet distribution
• Bio-compost pit construction: on-site demonstration of management of bio-wastes that generates in the households
Clean campus Green campus: Activities

- Organising swap shops (a shop where used materials that are still usable are exchanged for those who want to use it)
- Skill training to make eco-friendly products and products from unused materials
- Awareness programs such as rallies, street plays and flash mobs
- Mini Material Collection Facility (MCF) for collecting unused plastics
Publications

• Training facilitators handbook on success models in Waste Management by Local Self Government Institutions

• Handbook on source level treatment devices

• Handbook on Biogas plants installation and maintenance

• Waste Management Manual for engineers

• Comprehensive booklet ‘Waste’
- ODF sustainability campaigns
- Continuous Mass/Mid media Interpersonal communication activities
- Organising best practice competitions for Residence Welfare Associations, wards, houses, colleges, schools, institutions
- Grading of hotels/restaurants based on hygiene/waste management
- Study on the reach and impact of IEC
Green Protocol

- REDUCE the quantity of Waste generated
- Despise disposables and promote REUSABLE and RECYCLABLE articles
GREEN PROTOCOL

• Waste reduction & **disposable free campaign**
• Introduced in National Games 2015
• Followed in various events & functions (both Gov & Pvt)
• All government offices to comply with green protocol- order by GoK G.O (MS) No. 132/2018/LSGD dtd 19.09.1018
• All government functions to comply with green protocol
• **1369** government offices in the state following green protocol
School Arts Festival
Swearing in ceremony of the present government
Mission green Sabarimala
Events, functions
Green elections
Eco-friendly marriages & functions
Swearing-in ceremony
School fests
School fests
Zero waste Civil Station, Palakkad
Use of Eco-friendly products
Attukal Pongala festival today; will be completely ‘green’

OAK DIBOGO
Thiruvananthapuram, February 10

The Attukal Pongala festival that witnesses reportedly the largest congregation of women in one place is going green this year.

Hundreds of thousands of women devotees from within Kerala and outside will swarm Thiruvananthapuram for the festival being held on Tuesday.

Myoplastics: The city corporation is in talks with the district and temple administration, the Food Safety Department and the Suchitwa Mission to implement a green protocol for the festival this year. Divestees have been asked to bring a steel plate andumbrella to reduce the use of disposable plastic plates and cups. Voluntary organisations serving food and water will follow suit. Officials say that around 2000 water tanks and 1000 plates have already been collected from city residents for sharing with those who do not carry their own.

Meanwhile, Kerala’s capital will declare itself all-women for a day on Tuesday as locals descend to offer ‘pongala’ in the city at the famed Attukal Bhagavathy temple and its premises.

Elaborate security

This year, the number is expected to be in the range of 10,000, according to officials of the Attukal Bhagavathy temple. The city police have an expanded elaborate security arrangement in which 5,000 personnel are being mobilised and 12 additional battalions (cameras being deployed on trolleys). Traffic police personnel and medical teams are also on stand-by and have been deployed at strategic places.

The City Police Commissioner will himself oversee the security drive. The Rapid Action Force, the Thunderbolt Commandos and the Disaster Management Authority teams will comprise the ensemble.

Rush directions and disposal squads, sniffer dogs, and drone and handheld visceral detection teams will be put to use.

The procession will be monitored around the clock from the special control room at Attukal and also the city police control rooms.

Clean-up drive

An equally impressive effort will be mounted, as every year, to clean up the city after the devotions. The city corporation will mobilise 1000 of its sanitation workers for the purpose.

In addition, more than 1000 workers are being deployed on day-to-day basis for the clean-up. The local body will maintain 20 to 30 of its own trucks and 18ness ones for ferrying out waste generated during the festival that goes into making the open burners and spread in all.

By the night, the roads will be washed clean of any charred remains.

Suchitwa Mission, city corporation to deploy 300 volunteers

Steps to ensure green pongala

DC Correspondent

DC Correspondent

Suchitwa Mission, along with city corporations, will be tending to Pongalaverbatim. The mission, along with the Corporation, will be collecting disposable items, and the Corporation will be ensuring that such items are not sold to the public.

The mission will also be collecting disposable items, and the Corporation will be ensuring that such items are not sold to the public.

Volunteers close to the temple even will not just stop devotees from carrying disposable items, but will provide them with alternatives.

The mission will also be collecting disposable items, and the Corporation will be ensuring that such items are not sold to the public.

Volunteers close to the temple even will not just stop devotees from carrying disposable items, but will provide them with alternatives.
Ramadan
Thank you