SOLID WASTE MANAGEMENT IN TRIVANDRUM
HONORABLE MAYOR WITH GREEN ARMY VOLUNTEERS
Administration Wing

THIRUVANANTHAPURM MUNICIPAL CORPORATION – HEALTH WING

- HONORABLE MAYOR
- HONORABLE HEALTH STANDING COMMITTEE CHAIRMAN
- SECRETARY
- CORPORATION HEALTH OFFICER
- HEALTH SUPERVISOR-3
- HEALTH INSPECTORS-26
- JUNIOR HEALTH INSPECTOR -96
- AMW-77
- JPHN-37
- CONTIGENT WORKERS-1284
WASTE MANAGEMENT RULES

MSW Generation Rate

- Waste generation rate in Thiruvananthapuram ranges between 300 TONS/day
- 60% - 70% biodegradable waste.
- Population - 10,000,00 (Ten Lakhs)
- No of Households - 3LAKH
- 215 SQ KM
MUNICIPAL SOLID WASTE COMPOSITION
SOLUTION FOR BIODEGRADABLE WASTE

a) **Aerobic:**

Biodegradable waste → complex organic matter

Note: Some bacteria in the Pseudomonas species and Bacillus species help in aerobic degradation.

b) **Anaerobic:**

1. Hydrolysis
2. Acidogenesis
3. Acetogenesis
4. Methanogenesis

Complex organic matter → soluble organic molecules → volatile fatty acids → acetic acids → \( \text{CH}_4 + \text{CO}_2 \)

Note: Some bacteria in the Clostridium species, Streptococcus species help in anaerobic degradation.
Solid Waste Management methods adapted in Thiruvananthapuram-100%DECENTALISE METHOD
CENTRALISED PLANT

- SHUDDED DOWN ON 2013
Technical specifications of Aerobic bin

- Size: 1.45m x 1.45m x 1.2m (L x B x H)
- Leachate pipe: 110mm diameter
- Slurry tank chamber size: 45 x 45 x 45cm
- Composting period: 90 days.
- As per DSR 2016 a shed with 5 bins with beautification cost around approx. 8 lakhs (normal ground)

Manhole provided for leachate pipe
Aerobic bin at Karamana

Before

Present
Aerobic Composting method
Portable Aerobic Bin

Capacity is same as that of fixed aerobic bin.

These are placed where a temporary arrangement is to be provided for solid waste management.

Watertight roofs are provided to prevent rain water from entering the bin.

Provision given to collect leachate.
What is aerobic bin composting unit?

- The composting unit includes a box like structure with Ferro cement floor, provided with maximum openings for air circulation, leachate pipes provided at the bottom of individual bins collected in leachate chamber.
- Layers of cow dung/inoculum, carbon source and waste materials are subjected to composting in presence of oxygen.
- The temperature rises almost 70°C, the peak temperature, creates a lot of heat; killing all sorts of seeds and pathogens.
- No foul smell
- An aerobic compost bin reduces the biomass to usable compost quicker than its anaerobic counterpart
Factors affecting Aerobic composting

- Microorganisms
- Shredding of refuse
- C/N ratio
- Temperature
- Moisture content
- Aeration/turning
WASTE MANAGEMENT METHODS-SWM
AEROBIC BIOCOMPOSTER-TOTAL NUMBER OF ADOPTED HOUSES-8500
Pipe composting unit
- PVC pipes 200mm size, 1m long.
- Pipe is erected vertically inside a pit.
- Sufficient vents to be provided to carry out aerobic action
- Mechanism activated using external source like coir-pith or cow dung etc.
- Biodegradable waste laid on top of it.
- Mixing would prevent anaerobic action completely.
- Lead to failure due to some unexpected issues.

Total No of Pipe compost installed in individual households: 87000

Kitchen bin composting unit
- Capacity - 25 litres plastic bin, and plastic grow bags are used
- Initially starter material (initiating mechanism) is placed in the bag and further biodegradable solid waste.
Biogas Plants - INDIVIDUAL HOUSEHOLD

Total no of biogas plants installed: 1800
SUBSIDY-50% OF TOTAL COST, MAXIMUM 5000 RUPEES
CAPACITY -.5M3
Community Biogas plants

- No of Biogas plants installed: 56
PLASTIC WASTE SHREDDING UNIT-TO SHRRED THE PLASTICS

- NO OF SHREDDING MACHINES -2
- NO OF BAILING UNIT-2
- SHREDDED PLASTICS HAND OVER TO CLEEN KERALA COMPANY
- INCOME-18 RS/KG
RRC unit at Muttathara

Dust remover

Shredding unit
• The two Shredding units at Muttathara
COLLECTION OF GLASS, BAG, CHAPPELS, E-WASTE,

- EVERY THREE MONTHS
- HAND OVER TO AUTHORISED RECYCLING UNIT
FINE COLLECTED FOR LITTERING

- 17,50000 SINCE 2014
- WASTE LITTERING IN THE PUBLIC PLACE AND IN THE WATER BODY
- 24*7 SQUAD ENGAGED IN THE DUTY
GREEN ARMY VOLUNTEERS ENGAGED IN THE SEGREGATION TO FIND OUT PLASTC WASTE PRODUCER
• Bailing machine at Muttathara
• **Specification of the Shredding machine**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Size of the machine</td>
<td>150 x 150 x 75 cm</td>
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<tr>
<td>Capacity</td>
<td>1 ton/day (100Kg/hour)</td>
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<td>No of Blades</td>
<td>5</td>
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<tr>
<td>Power</td>
<td>20HP</td>
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</tbody>
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• **Specification of the Bailing machine**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamber size</td>
<td>900 x 450 x 450 mm</td>
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<tr>
<td>Bale size</td>
<td>450 x 450 x 450 mm</td>
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<tr>
<td>Bale weight</td>
<td>50 to 75 Kg</td>
</tr>
<tr>
<td>Motor</td>
<td>7.5 HP</td>
</tr>
</tbody>
</table>
- Shredded plastic stocked in sacks

- Clean Kerala company collects the clean plastic of the premises at a specified rate and after shredding, use it for road works.

- Apart from the shredding unit we have MRF at various places of Trivandrum.
KITCHEN WASTE?

Why not go for composting???
SEGREGATION AND COLLECTION AT 37 AEROBIC BINS POINTS

- SOURCE LEVEL
- COLLECTION POINTS-37 AEROBIC BINS
- NO DOOR TO COLLECTION
- WASTE COLLECTION TIME( DEGRADABLE )-5AM TO 9PM
- WASTE COLLECTION TIME(NON DEGRADABLE)-5AM TO 9PM
- FREE OF COST
CAMPAIGN FOR SEGREGATION-BY CYCLING
PUBLIC PARTICIPATION IN THE AWARENESS CAMPAIGN REGARDING SEGREGATION
BY MAGIC SHOW
EPR ACT-EXTENDED PRODUCER RESPONSIBILITY - IMPLEMENTED IN THE IND VS NZ MATCH AT TRIVANDRUM

- PRODUCER COLLECTED THE PLASTIC BOTTLE AFTER GETTING STRICT DIRECTION FROM THE CORPORATION
- THEY HAVE COLLECTED NEARLY 30 LOADS OF BOTTLE AND HANDED OVER TO RECYCLING
- FIRST TIME IN INDIA