

Plastic and Other Non-Biodegradable Waste Management in Kerala

Suchitwa Mission
Local Self Government Department
Government of Kerala





About Suchitwa Mission

- **Suchitwa Mission (SM) is the Technical body of Government of Kerala, under the Local Self Government Department (LSGD)**
- **Nodal agency in the State for implementing Swachh Bharat Mission Projects and for assisting LSGIs in projects related to sanitation and waste management**
- **SM activities include providing Technical Sanctions and issuing Government share of funds to sanitation and waste management projects**

NON BIODEGRADABLE WASTE MANAGEMENT PROCESS

Collection of Non Bio Degradable waste by Haritha Karma Sena from source



Transfer to Grama Panchayath/Municipal ward Level MCFs



Segregation –Recyclable / Non Recyclable - at MCFs



Transfer to Block Level / Municipal Level RRFs



Shredding of zero value plastics using shredding machines



Shredded plastic for polymerized road construction



Bailing of other plastics using baling machine and sale to recyclers



Rejects for Coprocessing and Safe landfill



NON BIODEGRADABLE WASTE COLLECTION

◆ **Harithakarmasena (HKS) functional in 1031 LSGLs out of 1034**



Haritha Karma Sena (HKS) or Green Task Force - a Micro Enterprise Unit formed in each LSGL 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

Harithakarmasena (HKS)

Each ward has 2 HKS (Green task force) members

- Their training given by the local bodies with the help of Haritha Sahaya Sthapanam empanelled by Suchitwa Mission.
- Mission has empanelled NGOs and agencies who have expertise and experience in this field as Haritha Sahaya Sthapanam to help/handhold HKS
- The user fee varies from Rs.40 to 60 for households and Rs.100 for institutions(for about 2 sacks and the amount will increase if the quantity of waste is more).
- Collected waste are stored at Mini-MCF located at ward level



Door to door collection



		Haritha karma Sena				as on	27-01-2023						
SI No.	District	Grama panchayaths				Municipalities				Corporations			
		Total no. of Grama panchayaths	Required no. of Haritha Karmasena Units	Haritha Karmasena Functioning Grama Panchayaths	Percentage	Total no. of Municipalities	Required no. of Haritha Karmasena Units	No. Haritha Karmasena Functioning in Municipalities	Percentage	Total no. of Corporations	Required no. of haritha Karmasena Units	Total No. Haritha Karmasena Functioning in Corporations	Percentage
1	Thiruvananthapuram	73	73	73	100.00	4	4	4	100.00	1	1	1	100.00
2	Kollam	68	68	68	100.00	4	4	4	100.00	1	1	1	100.00
3	Pathanamthitta	53	53	53	100.00	4	4	4	100.00	0	0	0	0.00
4	Alappuzha	72	72	72	100.00	6	6	6	100.00	0	0	0	0.00
5	Kottayam	71	71	71	100.00	6	6	6	100.00	0	0	0	0.00
6	Idukki	52	52	52	100.00	2	2	2	100.00	0	0	0	0.00
7	Ernakulam	82	82	82	100.00	13	13	13	100.00	1	1	1	100.00
8	Thrissur	86	86	86	100.00	7	7	7	100.00	1	1	1	100.00
9	Palakkad	88	88	88	100.00	7	7	7	100.00	0	0	0	0
10	Malappuram	94	94	91	96.81	12	12	12	100.00	0	0	0	0
11	Kozhikode	70	70	70	100.00	7	7	7	100.00	1	1	1	100.00
12	Wayanad	23	23	23	100.00	3	3	3	100.00	0	0	0	0.00
13	Kannur	71	71	71	100.00	9	9	9	100.00	1	1	1	100.00
14	Kasargode	38	38	38	100.00	3	3	3	100.00	0	0	0	0.00
Total		941	941	938	99.68	87	87	87	100.00	6	6	6	100.00

Activities of Haritha Karma Sena

- Conducting the survey regarding the requirement of waste management facilities at household and institutional level.
- Monitoring the establishment of source level solid waste management devices at houses and institutions.
- Visiting the houses and institutions where source level biodegradable waste management devices are installed every two weeks to inspect their working and provide necessary help.
- Assistance for composting like monthly supply of Inoculum
- Provide assistance related to Green protocol

Activities of Haritha Karma Sena Contd....

- Door to door collection of non-biodegradable waste(paper,plastic,tablet strip,etc) at regular intervals.
- Collection of user fee as decided by the local bodies for the services rendered by Haritha Kerala Mission.
- Conducting awareness programs as decided by Haritha Keralam Mission
- Selling of value added products made from the non-biodegradable waste through CKCL or other agencies

Non Biodegradable waste Collection Calendar 2023

Sl.No	Month	Type of waste
1	Jan	E waste
2	Feb	Medicine strips
3	march	Hazardous E waste
4	April	Glass waste
5	May	Shoes, bag, Chappals, Thermocol
6	June	Cloth waste
7	July	E waste
8	Aug	Glass waste
9	Sep	Medicine strips
10	Oct	Cloth waste
11	Nov	Shoes, bag, Chappals, Thermocol
12	December	Glass waste

All types of plastic waste and paper will be collected every month

Material Collection Facility (MCF)

- The plastic waste collected from households and institutions after sorting are transported to Material Collection Facilities (MCF) by HKS.
- MCFs -building >500 sq.ft , must have baling machine, weighing balance, facilities for HKS members
- The collected plastics are temporarily stored at mini MCFs and MCFs. There are 932 functional MCFs in panchayats , 114 MCFs in municipalities and 21 MCFs in Corporations(as on 27.01.2023).

Resource Recovery

Harithakarmasena (HKS) at LSGI level (Each ward 2 members)



Plastic collection from house - Kadirur GP

Door to door collection of dry waste



Storage and transfer

Mini MCF (Transfer stations at ward level)



Transportation from Mini-MCF to MCF



Material Collection Facilities at LSGI level (MCF)





MCF & Mini-MCF in Aryad GP in Alappuzha Dist.

Segregation at MCF

Collected materials are segregated at MCF and valuable items are sold locally from MCF itself



Plastics will be sent to RRF



Material Collection Facility (MCF)



Types of waste collected at MCF

1. **Plastic materials below 50 micron** -carry bags,toys,low quality strips and plastics,packing materials etc
2. **Plastic materials above 50 micron that have scope to be recycled** -PET bottles,Milk cover,different types of strips & sprays,Aluminium cans,broken buckets,plastic plates & furniture etc
3. **Leather products(shoes,bags),broken glass,broken plates (steel, aluminium, iron,etc),cardboards,newspaper,etc**
4. **Medicinal strips,toothpaste tubes, bottles and covers of beauty products**
5. **E-waste**
6. **Tyres,rubber products**
7. **Thermocol**
8. **Different types of metal**
9. **Beer cans/alcohol bottles**

Waste that cannot be collected at MCF

- **Biodegradable waste**
- **Food waste**
- **Slaughterhouse waste, poultry waste**
- **Market waste,**
- **Chemicals or Bottles containing chemicals**
- **Bottles containing kerosene, petrol & diesel**
- **Sanitary napkins, diapers**

Resource Recovery Facilities

- From MCFs, plastic is transported to Resource Recovery Facilities (RRFs).
- There are 57 functional RRFs in grama panchayats, 60 in Block panchayats, 67 in municipalities and 11 in corporations (as on 27.01.2023).
- At RRFs dust removal, shredding and baling of plastic waste are carried out to recover usable fractions. Recovered fractions from RRF are forwarded for its reuse or recycling.
- Plastic shreds, rejects etc. from MCFs are also transferred to CKCL.

Managing Non recyclable waste

- In RRFs, Plastic shredding and bailing machines of adequate capacities are installed for further processing.
- The non-recyclable plastics are shredded and used for road construction works (tarring).
- E-waste, glass and metals are channelised to recycling centres through Clean Kerala Company Ltd .



RECYCLING OF NON-BIODEGRADABLE WASTE

- **Resource Recovery Facilities functional on a cluster basis**
- **Segregated plastics are shredded and baled for further processing**

Plastic shredding unit



Plastic bailing unit



Material Collection Facility



Baling & Shredding facility at RRF



Shredding and Baling Units





**Resource Recovery Facility in Mundur BP
in Palakkad**



**Resource Recovery Facility in Bharanikkavu BP
in Kollam**

RRF IN RAILWAY STATION THIRUVANANTHAPURAM CENTRAL



Non biodegradable waste management facilities



Collection and safe disposal of Rejects by CKCL

- Recovered fractions from RRF are considered for reuse and recycling. Plastic shreds, rejects etc from MCFs are also transferred to CKCL.
- All canals, drains, public places and roads and highway sides are cleaned by the respective LSGIs as part of pre-monsoon cleaning operations. The waste that accumulate in this drive are largely non-recyclable waste that need to be converted in to RDF or to landfills.
- Most of the waste sent to cement kilns after converting it to RDF. Clean Kerala Company engage aggregators who have valid agreements with Cement Factories and these waste are transferred for safe disposal. So far 51,722 MT reject waste has been collected and disposed safely .

Flow Chart of Polymerized Road Construction Process

1. Cleaning of Plastic waste



2. Shredding of Plastic



3. Mini Hot Mix Plant



4. Aggregate transfer to puddler



8. Road Layering



7. Aggregate – Plastic – Bitumin Mix



6. Addition of Bitumin



5. Addition of Plastics

SHREDDED PLASTICS USED FOR ROAD TARRING



So far 2987 MT of shredded plastics handed over to Local bodies and PWD for road tarring so far and 5216 KM so far constructed



Road laying in progress

Ban on Single Use Plastics (SUPs)

State Government vide G.O. (MS) 06/2019/Envt dated 27.11.2019 (further clarification vide G.O. (MS) 08/2019/Envt dated 19.12.2019, G.O(Rt) No.04/2020/ENVT dated 16.02.2020) imposed complete ban on the manufacture, storage, transport and sale of the single use items in the State of Kerala with effect from 01.01.2020

Interventions in Prevention of Marine Plastic litter, pollution

Plastic Fischer Project at Thiruvananthapuram Corporation

END TO END SERVICE

BUILD



DEPLOY



COLLECT



SORT



PREPARE



PROCESS



Sl. No.	System No.	Location	Qty of plastic collected (tonnes)
1	System #1	Thakaraparambu)	18.057
2	System #2	KSRTC Bus Terminal	9.697
3	System #3	Puthenpalam	1.324
4	System #4	Shutter Palam	8.767
5	System #5	Enchakkal	0.918
6	System #6	Pattoor	0.131
7	System #7	Kannammoola	4.476
8	System #8	Sasthamangalam	0.681
9	System #9	Pallimukku	0.158
10	River bank/ Drying area collection	Kannammoola, Putharikandam Maithanam, Jagathy Ground, Enchakkal, Thakaraparambu	19.104
Total Plastic waste collected by the system			63.313 tonnes

Before



After



Before



After



CASE STUDY

System #1 at Thampanoor Thodu

- Status on 14th April, 2022
- PF hired excavator to collect waste from the drain
- Approx. 10 tonnes of waste was removed from the drain
- Waste collected was shifted to Putharikandam Maithanam for Drying operations
- Plastic recovery from collected waste ongoing; approx. 6 tonnes of plastic have already been recovered



Why:

- To store/shift the collected amounts from systems and dry it - especially during monsoon season
 - To avoid community resistance
 - Efficient end to end service

Status:

- Plastic Fischer made the provision of land an requirement to start operating in Trivandrum
- The Government promised us to provide land for our purposes
- The plot at *Kochuveli Industrial Estate* is unexpectedly not under the authority of SM
- Also space allotted at *Rajaji Nagar* cannot be used because of anticipated community resistance
- No sufficient space has been handed over to Plastic Fischer until today

Clearbot project at Trivandrum



POLLUTION RECOVERY

The most inexpensive way to clean trash, oil, and invasive weeds while running on electric power. The Clearbot Neo can collect up to 15L of oil and 200 kg of floating trash in a day.

Proposed Project Location

Veli Lake, located 10 KM away from Thiruvananthapuram city, is an attractive destination for tourists. At one end it is linked to Akkulam Lake and at the other end, it mingles with the Arabian Sea during monsoons. All the garbage that clogs the Veli Lake is discharged into the sea during monsoons. Based on our initial studies and site observation Veli Lake is a very suitable spot to deploy Clearbot. The garbage collected from the lake will be safely handled and processed by Green Worms at our Material Recovery Facility.

GREEN PROTOCOL

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



What is Green Protocol?

- Green protocol is essentially a set of measures which when implemented results in significant reduction of waste with primary focus on:
prevention of use of disposables and using reusable alternatives like glass/stainless/porcelain cutleries



How to follow Green Protocol?



- Avoid use of all types of disposables (including plastic, paper) in daily life



- Always use cups and containers that can be washed and reused instead of those made of plastic or paper

How to follow Green Protocol?



- Avoid 'use and throw' carry bags



- Always use bags made of eco-friendly materials

How to follow Green Protocol?



- Keep the non-bio degradable clean and dry and store separately based the type



- hand it over to local body systems or scrap dealer for recycling

How to follow Green Protocol?



- Always use eco-friendly materials like leaves flowers etc. for decoration and while making bouquets for felicitating guests.

Disposables can only be disposed like this. ...



*What we used to have fifteen
years back...*



Old is Gold



Green Protocol in events and functions



National Games 2015



Swearing in ceremony of
the present government



At home function, Rajbhavan





Attukal Pongala



Ramzan



Malayattur fest



Green protocol elections 2019- model polling booth-Kottayam



Green protocol Ramzan fest

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Green protocol followed in Koodalmanikyam festival, Thrissur

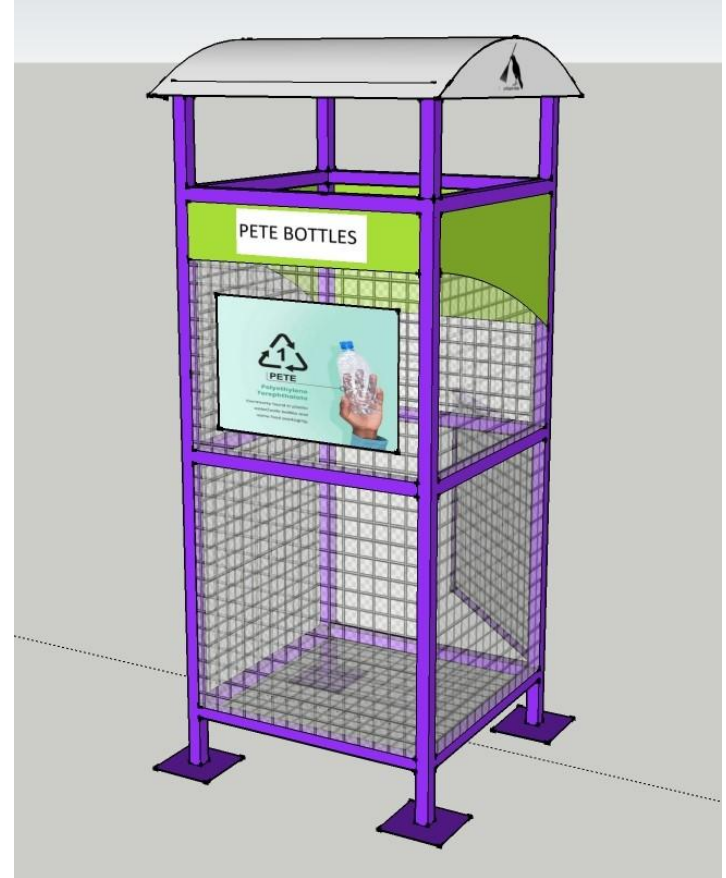


School Arts Festival

Eco-friendly marriages & functions



Collectors@School



Swap Shops to promote reuse of resources

Swap Shops are being opened by local bodies where people can drop their old items which may be useful for others in the society. From there, people can select things they need on a very minimal cost or even free of cost



Awareness among stakeholders

- A campaign was conducted and 10,000 government offices were identified as green offices in January 2021 and honorable CM has made a declaration regarding this on 26th January.
- State-wide campaigns were held regarding observing green protocol in Election to Local Body Councils in October 2020 and Assembly election held in April 2021. Use of PVC Flex material in election campaigns were strictly restrained.
- Selected enterprises under Kudumbashree were supported for launching alternate products. Rs.50,000 each were allotted to selected proposals for production and marketing of alternate products.

Awareness among stakeholders Contd....

A state level exhibition of alternate products with the participation of vendors in this field from across the state was held in January 2020 as part of Suchitwa Sangamam Campaign 2020.



The installations made from recycled waste plastic bottles on display on Kanakakunnu premises

THANK YOU!