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A Guidebook for Bulk-Waste Generators (BWGs)

Plastic Waste Management (PWM) in the State of Tamil Nadu



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State of Tamil Nadu

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Executive Summary

Inadequate environmental sanitation in many cities is a major concern across the globe. In India, waste management, especially plastic waste management, is gathering great importance as per capita plastic consumption is growing in the country. India alone generates nearly 34.69 lakh tonnes/annum (2019-2020) of plastic waste, of which Tamil Nadu contributes around 4.31 lakh tonnes/annum.



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generates nearly

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of plastic waste.

Tamil Nadu is one of the first states in the country to impose a stringent ban, effective from 2018, for the manufacture, storage, supply, transportation, sale and distribution of the identified list of single-use plastics, also known as one-time use and throw away plastics. The necessary legislative measures have been put in place in the country to tackle plastic waste, however implementation mechanisms to manage litter must be based on circular economy approaches. Since plastic is an unavoidable commodity and forms a part of the social strata, all the departments and private actors need to work cohesively to address the challenges of plastic waste management. Scientific knowledge, sharing of best practices, and partnerships to work together are essential to address the common and emerging challenges.

Sustainable plastic waste management, especially by Bulk-Waste Generators (BWGs), provides a comprehensive inter-disciplinary framework for addressing the major problems of plastic waste generation in the state. Bulk-Waste Generators have a crucial role as they generate huge volumes of waste and require decentralised facilities to collect, sort and transport the waste on their own or by engaging an external technical agency. It is imperative that thrust areas that require action pertaining to plastic waste management majorly include:

1. Prohibiting littering;
2. Adopting plastic-free alternatives in the organisation;
3. Promotion of waste segregation at source;
4. Conducting awareness programmes to disseminate information across the organisation's members;
5. Providing adequate community storage and source disposal options;
6. Implementing and complying to the Extended Producer Responsibility (EPR) rules, and
7. Practising models for sustainable plastic waste management.

This guidebook presents the practical strategies that BWGs can adopt and use to develop their own plastic waste strategies. The guidebook is prepared under the Indo-German technical cooperation project Circular Economy Solutions Preventing Marine Litter in Ecosystems (CES) that the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH implements on behalf of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) in close cooperation with the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India. The project is implemented in the Indian states of Kerala, Tamil Nadu and Uttar Pradesh. In Tamil Nadu, the project supports the Department of Environment, Forest & Climate Change (DoEFCC), Government of Tamil Nadu in digital tracking and monitoring of marine/riverine litter and demonstrating technological solutions for reducing, reusing and recycling plastics, and supports the implementation of the national framework of the Extended Producer Responsibility (EPR).

1. Introduction

It is a collective responsibility to manage waste for the protection of the environment. The collective approach and adopting circular economy are central for not only creating liveable habitats but also protecting our environment and natural resources. Circular economy solutions are embedded in the 3R (reduce, reuse, recycle) principles and will ensure a sustainable future with zero waste. It is estimated that 30%–40% of waste generation¹ is coming from bulk generator. In this context, the bulk generators of waste can play a significant role in improving waste management especially for plastics as well as creating a circular economy ecosystem. This guidebook is developed to support the Bulk-waste generators to better manage the plastic waste streams, with special focus on plastic packaging.

Circular economy solutions are embedded in 3R



principles and will ensure the overall vision of zero waste. It is estimated that

30%–40%

of waste generation is from Bulk generator.

¹ <https://cpheeo.gov.in/upload/5abcb3c488029Bulk-Waste-Generator-Book.pdf>

1.1 Introduction to Plastics

Plastics are known as a group of materials, either synthetic (derived from petroleum) or naturally occurring (derived from bio-based materials); they are polymers that are constructed from small molecular fragments known as monomers. Plastics are shaped when soft and then hardened to retain the given shape.

Types of Plastics are:

Polyethylene Terephthalate (PET) - is the light weight, transparent, most used and found in beverage bottles, jars, polyester cloth material etc.

High-Density Polyethylene (HDPE) - is strong, resistant, and usually found in shampoo bottles, milk cartons, buckets etc.

Polyvinyl Chloride (PVC) - is rigid and resistant to wearing and is generally used in plumbing pipes, toys, credit cards etc.

Low-Density Polyethylene (LDPE) - is a flexible version of HDPE used in garbage bags, grocery bags, cling wrap etc.

Polypropylene (PP) - is very durable, more heat resistant, and hence used in straws, bottle caps, food package containers etc.

Polystyrene (PS) - also known as Styrofoam, it insulates very well and is used in cups, takeout food containers, egg cartons etc.

Others include all other types of plastic which do not fall under any of the above categories. These include eyeglasses, baby bottles, CDs/DVDs etc.

The use of plastics has become more common due to its durability, lightweight, and ease of manufacture. It is also to be noted that since plastic can easily be made thin and lightweight, it does not appreciably add volume or mass to transport and keeps the transportation cost in check. Though plastic was initially assumed to be harmless and inert, through the years, the disposal of plastic into the environment has led to diverse problems. This dexterity of plastic and its nature to break down into microplastics during degradation contributes to the pollution on land and water.



1.2 Plastic Waste – Issues and Consequences

The United Nations Environment Programme (UNEP) has reported that globally, over 400 million tonnes of plastic waste is generated each year, of which 36%² of all plastics produced are used in packaging, food and beverage containers, and approximately 85% of that end up in landfills or as unregulated waste. India alone generates nearly 34.69 lakh tonnes/annum (2019–2020) of plastic waste, of which Tamil Nadu contributes around 4.31 lakh tonnes/annum³(2019–2020). It is important to note that India's per capita plastic consumption is 11 kilograms (kg) per year, as against the global average of 28 kg per year.

The characteristics that make plastic durable and sturdy also contribute to it becoming non-degradable. This does not mean plastics do not break down; instead, it takes a minimum of 10–20 years to 400–800 years to completely degrade. Plastics are never fully degraded since it only breaks down from sunlight and other environmental factors, viz., waves, storms, rain etc. Plastic breaks down into microplastics, which contain many toxic elements and makes its way to our aquatic and marine life, which is an inseparable part of our eating habits. The key issue is that plastics contain chemical combinations that does not decay easily, and the combination of plastic with other materials makes it more challenging and difficult for further processing or recycling. The illustration below explains how and why plastic has an effect on our environment and human health.



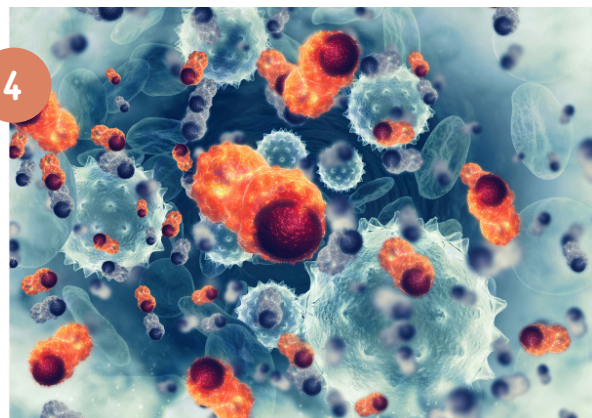
1 Food and Water Pollution



2 Air Pollution



3 Breakdown into Microplastics



4 Human Health

2 https://www.unep.org/interactives/beat-plastic-pollution/?gclid=CjwKCAiAnZCdBhBmEiwA8nDQxUcOEvvplei-Je6A8iTMlSuR6m2BiBwXlSgX-0HUf2BvTCi9QHXB3BoCK30QAvD_BwE

3 https://tnpcb.gov.in/pdf/Annual_Report/AnnulReport_Eng_2021.pdf

1.3 Linkages between Plastic Waste Management and the Sustainable Development Goals

Countering plastic pollution is an integral part of the global sustainability agenda. Plastic Waste Management is directly connected with several Sustainable Development Goals (SDGs). Some of the relevant SDGs, where the use and disposal of plastics have a major impact, are listed below.



- Plastics easily break down into nano plastics which can easily penetrate the body.
- Plastic polymers and additives (chemical substances) disturb the hormone balance in animals and humans.



- Riverine and Marine pollution results in plastics entering the inland water bodies compromising potable water quality.
- Effective waste collection systems with an emphasis on reduced use of plastics are needed to prevent water pollution.



- Due to a lack of innovative, sustainable technologies and location-specific infrastructure, there is an improper management and processing of plastic wastes.



- The effective collection and processing of plastic waste helps in creating clean, pollution free and sustainable habitats.



- Unchecked production and consumption of plastic have a negative influence on the functioning of ecosystems and endanger all living beings as well as their food supply.



- The production of plastic accounts for approximately 10% of the global annual usage of fossil fuels.
- The reduction in the manufacture and use of plastics will, in turn, reduce the Greenhouse Gas (GHG) emissions.



- About 100,000 marine animals and 1 million sea birds are impacted due to ocean plastic ingestion or entanglement each year.
- Plastics in water break down and also enters the human body through aquatic life.



- Plastics can lead to suffocation in animals and in the quantity of consumable food.
- Reduction in plastics will quickly lead to the recovery of ecosystems and biodiversity.

2. Bulk Waste Generators

Solid Waste Management (SWM) Rules, 2016 defines Bulk-waste Generators (BWGs) as waste generators that generate more than 100 kg of waste per day. The rule mandates that the BWGs should properly segregate the wet and dry waste and dispose of the dry waste to authorised recyclers/agencies. The Bulk Waste Generators roughly generate 30% of the daily total waste and hence it is vital that the BWGs play an important role in waste management and leading the way in taking efforts in steering the other waste generators in the right direction. Following the SWM Rules, all the Urban Local Bodies in Tamil Nadu have implemented Solid Waste Management bye-laws which include user charges, spot fines and methodologies for SWM.

The Bulk Waste Generators roughly generate

30%

of the daily total waste and hence it is vital that the BWGs play an important role in waste management



Residential	Commercial	Government, Public sector or private bodies	Social Infrastructure
<ul style="list-style-type: none"> The cooperative group housing society having more than 300 flats, markets* Central Government Residential colonies* RWAs 	<ul style="list-style-type: none"> Restaurant(s) with more than 200 seating capacity* All 4- and 5-Star Hotel(s)* Shopping Complex(es)/ Mall(s) having built-up area of more than 5,000 sq. mts* 	<ul style="list-style-type: none"> Central Government Ministries, Departments and Undertakings State Government Ministries, Departments and Undertakings Local Bodies Public Sector Undertakings Private Sector Offices, Complexes, Buildings 	<ul style="list-style-type: none"> Hospital(s)/Nursing Home(s) which have more than 200 beds whether private or Government* Places of Worship Stadia and Sports Complexes Clubs and Marriage Halls Recreation/Entertainment Complexes Hostel/Schools, Colleges, Universities, Educational & Training Institutions having more than 500 students for accommodation* Railway Stations/Bus Stations/Airports etc.

The gamut of BWGs is categorised into four major categories based on the nature of their operation, physical presence, and commercial scale. The following table identifies each of the actors, who are formed into a category with roles and responsibilities in handling their daily waste generation.

In February 2022, MoEFCC released the official guidelines on the Extended Producer Responsibility (EPR) for plastic packaging vide the Plastic Waste Management (Amendment) Rules, 2022. As per the notified rules on Extended Producer's Responsibility (EPR), the onus is placed on the Producers, Importers and Brand owners (PIBOs) of plastic packaging for the environmentally sound management of the product until the end of its life towards plastic waste minimisation and recycling. The Brand Owners (BOs), including online platforms/marketplaces and supermarkets/retail chains other than micro and small enterprises as per the criteria of the Ministry of Micro, Small and Medium Enterprises (MSME), Government of India are obligated under EPR to fulfil the targets for recycling of waste and use of recycled content in packaging. Such BO who falls under the classification of BWG must register on the online centralised portal developed by the Central Pollution Control Board (CPCB) for fulfilling the Extended Producer Responsibility obligations. They may operate schemes such as a deposit refund system (DRS) or buy-back or any other model to develop a separate waste stream for collection of plastic packaging waste to prevent mixing of plastic waste with solid waste.

Who is a Bulk Waste Generator?

"Bulk Waste Generator" means and includes buildings occupied by the Central Government Departments or Undertakings, State Government Departments or Undertakings, Local Bodies, Public Sector Undertakings or Private Companies, Hospitals, Nursing Homes, Schools, Colleges, Universities, other Educational Institutions, Hostels, Hotels, Commercial Establishments, Markets, Places of Worship, Stadia and Sports Complexes etc having an average waste generation rate exceeding 100 kg per day (of all waste streams put together).

3. Regulatory Framework

for BWGs to Manage the Plastic Waste

3.1 Solid Waste Management Rules

As per SWM rules, 2016, Bulk waste generators are entities engaged in generating large quantities of daily waste and are mandated to adhere to certain regulations:

- **Waste segregation** in Campus/premises in three separate streams, namely bio-degradable, non-bio-degradable and domestic hazardous waste.
- Wrap the used sanitary waste, like diapers, sanitary pads etc. securely, in the pouches provided by the manufacturer or brand owners or suitable wrapping material.
- **Process Wet Waste** (Bio-degradable) within premises.
- **Handover segregated dry waste to the ULB** waste collector or to an agency, who is authorised to collect daily waste by the local authorities.
- **Store horticulture and garden waste generated from the premises separately and encourage** composting in compost pits within the premises.
- **Store the Construction and Demolition waste** generated on the premises separately and dispose of it as per the notifications under the Construction and Demolition waste management rules, 2016.
- **Ensure appropriate disposal channels, especially for e-waste.**
- **Resident Welfare, Market Associations; gated communities and institutions with more than 5,000 sqm; all hotels and restaurants:**
 - Ensure waste segregation at source by generators, facilitate collection of segregated waste in separate streams, and hand over the recyclable material to either authorised waste pickers or authorised recyclers.
 - The bio-degradable waste shall be processed, treated, and disposed of through composting or bio-methanation within the premises as far as possible.
 - The residual waste shall be given to waste collectors or agencies as directed by the local bodies.
- **Events:**
 - The event organiser shall ensure waste segregation at source and handling over segregated waste to waste collector or agency as specified by the local body.
- **All waste generators shall pay such user fees for solid waste management, as specified in the bye-laws of the local bodies.**

3.2 Plastic Waste Management Rules

The Plastic Waste Management Rules were notified in 2016 by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India to act as a regulatory framework for the management of plastic waste in the country. As per clause 8 of the Waste Management Rules, the bulk waste generators should:

- Adopt methods to minimise plastic waste.
- Segregate and store the waste and hand over the segregated waste to authorised waste processing or disposal facilities or deposition centres either on their own or through the authorised waste collection agency.
- Awareness generation and capacity building of formal and informal workers involved in waste management to handle the waste responsibly and efficiently.
- Use of personal care equipment by workers while handling waste

3.3 Tamil Nadu specific rule on Plastic waste management

The Government of Tamil Nadu vide Government Order (Ms) No. 84 Environment and Forests (EC.2) Department notified the ban on Single-use plastics (SUP), known as the one-time use and throw away plastics on 14 identified items irrespective of thickness, effective from 01.01.2019. The plastic ban in Tamil Nadu is one of the most comprehensive bans amongst the Indian states, and extends to the manufacturing, storage, supply, transportation, sale and distribution of these identified SUPs. The GO defines throw away plastics and mandates for shopkeepers, retailers to avoid using them.

The Government of Tamil Nadu vide Government Order (Ms) No. 116 Environment and Forests (EC.2) Department notified the people's campaign against throwaway plastics in the State. Meendum Manjappai campaign was launched by the Department of Environment and Climate Change and Forests to generate awareness about the plastic menace and invite participation from various sectors to eliminate the use of banned single-use plastic. The campaign was a revival of the eco-friendly tradition of using the yellow-coloured cloth bags and promoting the use of eco-alternatives for the banned SUP items.

As per the Draft Plastic Waste Management By-laws, 2019 of Greater Chennai Corporation, it is highlighted that "All bulk waste generators shall install and maintain Reverse Vending Machine, or any other appropriate system of recycling PET bottles as approved by the Central Pollution Control Board/Tamil Nadu Pollution Control Board". Any violation of the by-laws would result in penalty as per Schedule I of the law:

Penalty: As per the Solid Waste Management By-laws, 2018 of the Chennai Corporation, it is mandated that Rs. 5,000 will be charged as penalty for non-segregation of plastic waste at source by bulk generators or institutional waste generators. It is also mentioned that if BWGs are not complying with non-recycling of PET bottles they are liable to pay fine as per category of BWG a) Residential – Rs.5000 b) Commercial-Rs.15,000 c) Institutional-Rs. 10,000.

The Plastic waste management rules (Amended) details the various roles of stakeholders like local bodies, gram panchayath, waste generators and PIBOs. The detailed guidelines can be found under the TNPCB's official website for [Meendum Manjappai Campaign in Tamil Nadu](#).

As a policy initiative, the Government of Tamil Nadu is also planning to develop and implement green protocol, to be followed during festive events and other mass gatherings in the city such as sports competitions and college festivals, exhibitions, events in offices, hotels, and institutions, as well as political, state, and other community events. The green protocol will act as a guideline designed to restrict the use of SUPs during events and encourage the use of SUPs alternative materials. The protocol will also include guidelines for segregated collection of plastic waste from bulk generators as well as large gatherings such as sports matches and cultural events.

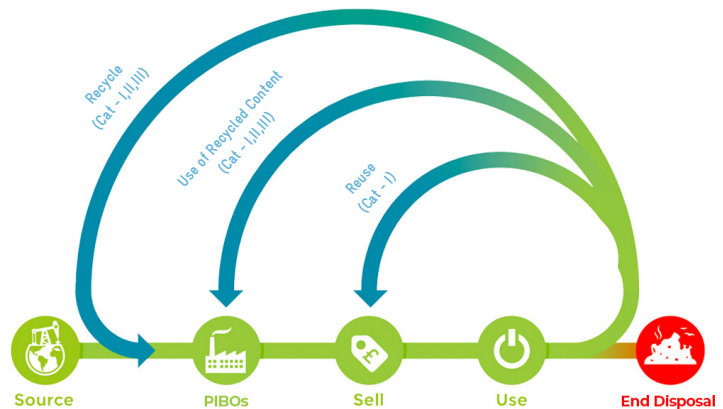
3.4 EPR Regulations for plastic packaging in India

The Ministry of Environment, Forest and Climate Change, Government of India, has notified the Guidelines on EPR for plastic packaging under the Plastic Waste Management Rules, 2016, with its fourth amendment in February 2022. It notifies the Producers, Importers and Brand Owners who supply their products in the market have the Extended Producers Responsibility obligation to manage plastic waste generated by the plastic packaging of their products. They should collaborate with the local governments to build a strategy to manage plastic waste generated by their products. The role of stakeholders in EPR implementation is extremely important in implementing the framework on-ground at the state levels. PIBOs and Plastic Waste Processors must work cooperatively to help ensure compliance under the EPR framework.

The regulation focuses on four categories of plastic packaging,

- Rigid (Category 1)
- Flexible (Category 2)
- Multi-Layered Packaging (Category 3)
- Compostable Plastic Packaging (Category 4).

The PIBOs have targets as a percentage of Put-on Market (PoM) packaging. These targets are for recycling of packaging waste, use of recycled content in packaging, reuse of packaging material (Only for Brand owners) and end-of-life disposal. The targets increase each year incrementally.



The registered recyclers with the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs), upon reporting the quantum of recycling of plastic packaging waste, will be issued credits, which they can trade with PIBOs. PIBOs shall buy credits directly from the recycler or can engage with other agencies to fulfilling their obligations. On non-fulfilment of targets, the PIBOs would have to pay an Environment Compensation (EC).

3.5 Ban on Single-Use Plastics

SINGLE-USE PLASTIC BAN IN INDIA

Due to the growing production of single-use plastic items, its environmental mismanagement, and its low utility and high littering potential. The Government of India has amended the Plastic Waste Management Rules 2016 prohibiting specific items of single-use plastic, and there is a complete ban on sachets using plastic material used for storage, packing, or selling gutkha, tobacco and pan masala.

As per PWM (amended) rules 2021 by the Ministry of Environment, Forest and Climate Change (MoEFCC), the Government of India prohibited identified single-use plastic (SUP) items and announced the ambitious target of phasing out SUP by 2022. The Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India is making various efforts in combatting single-use plastics items, issuing different bans, notifications and facilitating necessary regulatory efforts through awareness workshops, conferences and, seminars etc. MoEFCC is driving various initiatives along with SPCB/State Departments of Environment to implement the ban and support initiatives enabling the transition.

Plastic items can take up to hundreds of years to decompose
 A few hours or days of use, but several lifetimes damaging the environment.

- Plastic Bag 20 Years
- Plastic Water Bottle 450 years
- Plastic Straw 200 Years
- Plastic cup 450 years

The Central Pollution Control Board has regularly instructed all manufacturers, brand owners, producers, commercial players, online platforms, sellers, and retailers to stop selling/using banned plastic items through their platforms.

SINGLE-USE PLASTIC BAN IN TAMIL NADU

Tamil Nadu is one of the first State in the country to impose a stringent ban across the state effective from 2018 for the manufacture, storage, supply, transportation, sale and distribution of the identified list of single-use plastics, also known as one-time use and throwaway plastics.

The Department of Environment, Climate Change and Forests (DoECCF), including the Tamil Nadu Pollution Control Board (TNPCB), and the Government of Tamil Nadu are making robust efforts to implement the plastic ban and enforcing strict actions by State agencies. The State Government of Tamil Nadu, through TNPCB, had issued a Government Order no 84 and banned 14 one-time use and throwaway plastic (single-use plastics) items, including manufacture, stocking, sale and distribution, effective from 2019. The Government of Tamil Nadu has banned 14 items, such as plastic sheets, plastic plates, plastic tea/water cups, water pouches/packets, plastic straws, plastic carry bags and plastic flags irrespective of thickness, effective from 1.1.2019. The Department of Environment, Climate Change and Forest, Government of Tamil Nadu is making strenuous efforts to communicate the ban, generate awareness among the public, especially the students, women and youth on the ban and introduce the availability of eco-alternative products for the banned single-use plastic products.



List of banned SUP items at the National and State level

S. No	SUP Products	Banned by Go TN	Banned by MoEFCC
1	Candy with plastic sticks	Yes	Yes
2	Plastic plates, cups, tumblers, cutlery such as forks, spoons, knives, straws, trays	Yes	Yes
3	Earbuds with plastic sticks	Yes	Yes
4	Ice cream with plastic sticks	Yes	Yes
5	Non-woven Carry Bags	Yes	No
6	Plastic carry bags of all sizes & thickness	Yes	Ban only for plastic carry bags with a thickness <120 microns
7	Plastic-coated carry bags, paper cups	Yes	No
8	Plastic flags	Yes	Yes
9	Plastic or PVC banners less than 100 microns	Yes	Yes
10	Plastic sheet / cling film used for food wrapping, spreading on the dining table	Yes	Yes
11	Plastic sticks for balloons	Yes	Yes
12	Plastic Thermocol plates	Yes	No
13	Polystyrene (Thermocol) for decoration	Yes	Yes
14	Thermocol cups	Yes	No
15	Water pouches/packets	Yes	No
16	Wrapping or packing films around sweet boxes, invitation cards, cigarette packets	Yes	Yes

4. Management of Plastic Waste in Tamil Nadu

With the economic growth and changing lifestyle, the waste generation in Tamil Nadu has increased drastically over the years, more than 8.5% estimated from FY 2020-21 to FY 2021-22. The 2020-21 TNPCB annual report⁴ shows that solid waste generation is 13,422 tons/day (TPD), with approximately 8.7% of plastic waste.

The waste amounting to **2,95,482 TPA** is channelised for recycling



4 https://tnpcb.gov.in/pdf_2022/SWMAnnualRpt2122.pdf

In 2021-22, TNPCB estimated 4,30,107 TPA plastic waste generation in Tamil Nadu, of which urban local bodies take prime responsibility for collection and segregation. The waste amounting to 2,95,482 TPA is channelised for recycling. The non-recyclable plastic waste of approximately 71,200 TPA has been utilised for co-incineration in cement plants and road laying (low-value plastics); and the remaining is disposed to landfill. A total of 438 Material recovery facilities are reported in the same year, with 68 ULBs disposing of the non-recyclable and combustible fraction to cement factories/sugar mills/power plants. In Tamil Nadu, the collected plastic waste is recycled in recycling units authorised by the Tamil Nadu Pollution Control Board (TNPCB). As per the CPCB, 2019-'20 PWM annual report, there are 227 recyclers registered in the State. These recycling units process plastic waste through various methods such as sorting, cleaning, shredding, melting, and extrusion to produce recycled plastic pellets, which can be used as raw material for manufacturing new plastic products. The collected plastic waste that cannot be recycled or is of low quality is disposed of in authorised solid waste disposals facilities, such as sanitary landfills or waste-to-energy plants. However, the uncollected plastic waste is a nuisance, as it ends up in the riverine and marine ecosystem. A study "Baseline assessment to identify hotspots of plastic waste and open drains along the Adyar and Cooum Rivers in Chennai", which has been conducted under the Indo-German technical cooperation project Circular Economy Solutions Preventing Marine Litter in Ecosystems (CES) together with Kabadiwalla Connect, for the Chennai region also found that 32% of plastic waste, mainly non-recyclable plastics, ends up in rivers Adyar and Cooum. In addition to the formal plastic waste management system, an informal sector is also involved in plastic waste management in Tamil Nadu. Informal waste pickers or rag pickers collect plastic waste from streets, households, and other public places and sell them to scrap dealers or recycling units for income. However, this informal sector often faces challenges such as a lack of proper protective equipment, low wages, and inadequate working conditions.

The Government of Tamil Nadu: Initiatives on SUPs

I. MEENDUM MANJAPPAI CAMPAIGN

The *Manjappai* (yellow coloured cloth bag) is used as a metaphor to connect with ancestorists' traditional use of cloth bags in the State and culture. The '*Meendum Manjappai*' campaign is a unique campaign initiated by the Department of Environment, Climate Change and Forest, Government of Tamil Nadu to create environment awareness among public to restart the use of very old and traditional *Manjappai* instead of plastic carry bags. The campaign was launched by the



Photo credits: DoEFCC, Govt. of Tamil Nadu

Thiru. M. K. Stalin, Hon'ble Chief Minister of the State of Tamil Nadu on 23 December 2021, and the campaign continues even today, in different districts with awareness activities and messages on the ban on SUP and promoting the use of eco-alternatives.

GIZ India, under the CES project, is jointly supporting the *Manjappai* campaign. The project is actively supporting the state initiatives to implement the ban on Single-use plastics and generate awareness and engage with various stakeholders. The project is implementing various activities to support the implementation of the Extended Producer Responsibility (EPR) policy in the state, supported the State Action plan on Single-use Plastic ban, and a State-level Coastal clean-up campaign.

II. MANJAPPAI VENDING MACHINE.

The Manjappai vending machine is a first of its kind initiated by the Department of Environment, Climate Change and Forest, Government of Tamil Nadu. The vending machine, wherever installed, gives out a cloth bag for a minimal cost of Rs. 10 or 20 to facilitate the elimination of plastic carry bags and promote the use of cloth bags.



Photo credits: DoEFCC, Govt. of Tamil Nadu

III. NATIONAL EXPO ON ECO ALTERNATIVES TO SUPS AND START-UP CONFERENCE 2022

The expo cum conference was conducted by TNPCCB to create awareness about the adverse effects of disposal of Single-use plastics and available alternatives to SUPs. More than 170 manufacturers of eco-alternatives from across the country participated and displayed their eco-alternative products such as coir, bagasse, rice, jute, bamboo, cotton, coconut and pottery etc. The handbook of exhibitors displayed at the expo details out the start-ups and innovators engaged in producing and sale of the eco-products across the country.



Photo credits: DoEFCC, Govt. of Tamil Nadu

IV. DIRECTORY OF ECO-ALTERNATIVE

To act as a connect between the eco-alternative manufacturers and buyers, the Tamil Nadu Pollution Control Board, the Department of Environment, Climate Change and Forest, Government of the Tamil Nadu has compiled and released the 'Directory of Eco-alternative' that outlines data on the agencies engaged in production of eco-alternatives at various districts of Tamil Nadu.

V. SPECIAL TASK FORCE

A Special task force at the state of Tamil Nadu is constituted as per the guidance of the MoEFCC and CPCB. The special task force under the leadership of Chief Secretary of the state will enforce the implementation of the SUP ban through coordinated efforts of the various departments.

5. Bulk Waste Generators

Actions and Approaches for Plastic Waste Management

Bulk Waste Generators possess a crucial role in the entire waste management system. They generate huge volumes of waste and require decentralised facilities to collect, sort and transport the waste on their own or by engaging an external technical agency. The tables outline a quick view of the key actions from various BWGs on plastic waste management.



S. No	Category	Expected Actions from BWGs		
		Sustainable consumption practices	Sorting & Storage of Waste	Transportation of Waste
1	Institutions (Schools and Colleges)	<ul style="list-style-type: none"> SUP free approaches- Adopting alternatives to banned plastic items Source segregation 	<ul style="list-style-type: none"> Secondary sorting Store segregated plastic waste separately Adopt three bin systems to prevent cross contamination of plastics with organic and other waste. 	<ul style="list-style-type: none"> Municipal agencies/ULB Plastic waste to recyclers Private agencies
2	Residential Welfare Associations/ Gated Communities	<ul style="list-style-type: none"> Adopting reuse-refill models Source segregation 	<ul style="list-style-type: none"> Store segregated plastic waste separately Adopt three bin systems to prevent cross contamination of plastics with organic and other waste. 	<ul style="list-style-type: none"> Municipal agencies/ULB Plastic waste to recyclers Private agencies
3	Hotels & Restaurants	<ul style="list-style-type: none"> SUP free approaches- Adopting alternatives (Plastic-free/plastic reduction measures) Source segregation 	<ul style="list-style-type: none"> Store segregated plastic waste separately Adopt three bin systems to prevent cross contamination of plastics with organic and other waste. Hence, there must be provision of storage for all waste streams 	<ul style="list-style-type: none"> Municipal agencies/ULB Plastic waste to recyclers Decentralised waste treatment models
4	Malls/ Shopping complexes	<ul style="list-style-type: none"> SUP free approaches- Adopting alternatives (Plastic-free/ plastic reduction measures) Adopting reuse models Source segregation 	<ul style="list-style-type: none"> Store segregated plastic waste separately Prevent cross contamination of plastics with organic and other waste. Hence, there must be provision of storage for all waste streams. 	<ul style="list-style-type: none"> Municipal agencies/ULB Plastic waste to recyclers Decentralised waste treatment models
5	Hospitals	<ul style="list-style-type: none"> Source segregation 	<ul style="list-style-type: none"> Store segregated plastic waste separately. Prevent cross contamination of plastic waste with organic, medical/hazardous waste. 	<ul style="list-style-type: none"> Municipal agencies/ULB Plastic waste to recyclers Private agencies handling medical waste Decentralised waste treatment models

5.1 BWGs actions: Plastic Waste Generation

5.1.1 PLASTIC WASTE REDUCTION MEASURES FOR BWGS

Bulk waste generators could play an enabler role in reducing the volume of plastic waste that is generated and ends up in landfills and support adhering to the laws and norms set out by both the local governments and the national government. When resources are managed properly, they help create a Circular Economy where products can be used to their fullest potential with secondary use and reduce the quantity of fresh raw materials needed. CPCB has highlighted to the National Green Tribunal (NGT) that Bulk generators like e-commerce giants need to fulfil their EPR obligation and are required to establish a system for collecting plastic waste generated from the packaging of products. Although e-commerce companies are covered under the Plastic Waste Management Rules 2016, they continue to use excessive plastic in products due to lack of effective monitoring and implementation measures. Moving forward, the e-commerce platforms, including their policies and procurement practices, vendor selection, and other related aspects that need to be aligned with the above NGT orders and directions in various cases, need consistency across various rules and the EPR framework.

Initiatives on reducing Plastic waste

Based on the consultations, “Support to Start-Ups and Innovators on Alternate Packaging Materials” by The Energy and Resources Institute (TERI), which has been conducted under the Indo-German technical cooperation project Circular Economy Solutions Preventing Marine Litter in Ecosystems (CES), it was established, it was established that there are constant efforts to switch from plastic packaging to paper-based solutions, making plastics completely biodegradable as well as jute and cloth packaging. It identified some initiatives supported by start-ups and innovators aim to reduce plastic waste generation following the 3R approach of reduce, reuse and recycle to adapt to sustainable solutions and promote sustainable consumption.

For example, Everwards provides alternative packaging solutions to agencies, corporate customers and educational institutes in Chennai. In terms of product used for alternate packaging they focus on stainless steel packaging for dry products, upcycled glass for paper and use of shredded newspaper instead of Styrofoam.

Unilever is working towards making plastics circular through a three-way approach of reduction, reuse, and recycling, by increasing the use of post-consumer plastics in products. They are also testing markets for next-generation paper bottles instead of plastic bottles. The company has partnered with retail joints in Philippines, the UK and Brazil to provide refill stations for reusable aluminum containers. In India, Unilever is piloting a homeware brand in Reliance chains for dispensing homeware liquids for dishwashing, laundry at refill stations, with an aim to scale this up to reduce plastic use.

ITC is focused on sustainability and has robust initiatives in place to reduce the use of plastic in its packaging. The company primarily uses flexible and rigid packaging, with a focus on recyclability for its products. They are currently experimenting with paper-based packaging as an alternative to plastic, particularly for products like 1 kg packs of Atta. They are also exploring other alternatives to plastic such as compostable plastics and bamboo cutlery. They have a dedicated R&D Centre called LSTC material sciences in Bangalore working on packaging innovation.



Refill truck dispensing consumer products free of plastic packaging in Lucknow.

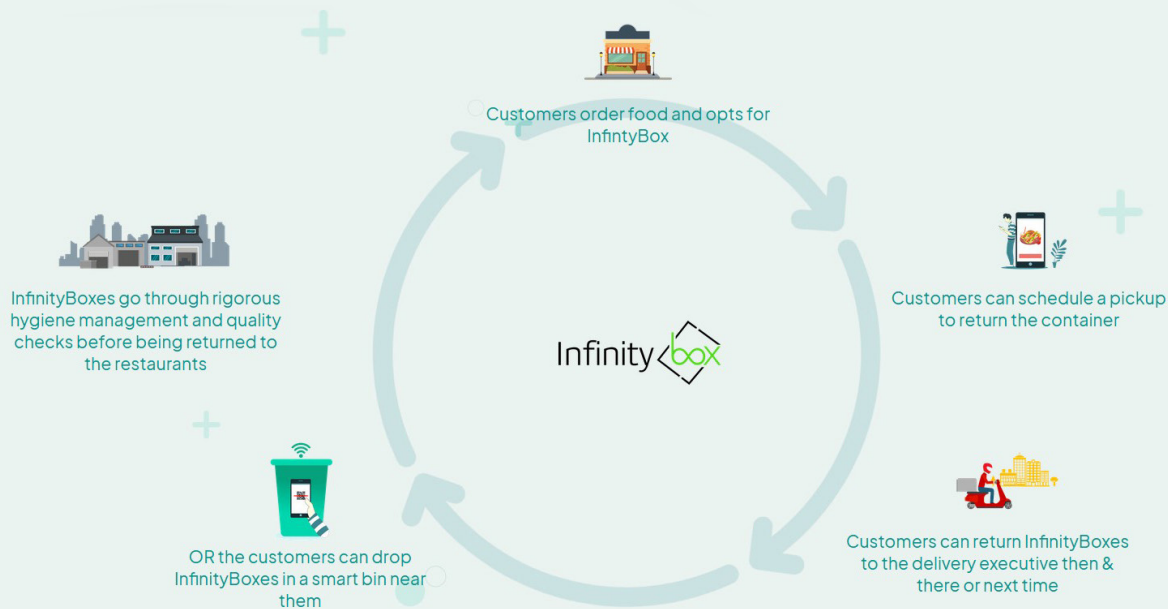


Photo credits: Refillable (Pilot supported by CES project)

Manjappai vending machines is the unique innovation identified by the Department of Environment, Climate Change and Forests, Government of Tamil Nadu. The automatic vending dispenses cloth bags at rupees 10 for every buyer and the Tamil Nadu Pollution Control Board (TNPCB) has taken efforts to install the machines at busy and populated marketplaces to access cloth bags at minimal cost to eliminate the use of cloth bags. The initiative is well welcomed and recognised by the public.

Reuse model: Refillable, a start-up from Mumbai, provides portable convenience store with a range of sustainable eco-friendly home care products targeting households, resident associations etc. Working across in India, Refillable offers products that are designed in such a way that the packaging is reduced, and customers can use their own reusable or refillable packaging which can be refilled at selected locations (vehicle visiting housing colonies or stationed at dedicated locations). Refillable models of packaging replace single-use containers (totes, jars, boxes, bottles etc.), thus shifting perspectives to a 'Reuse-Refill' economy.

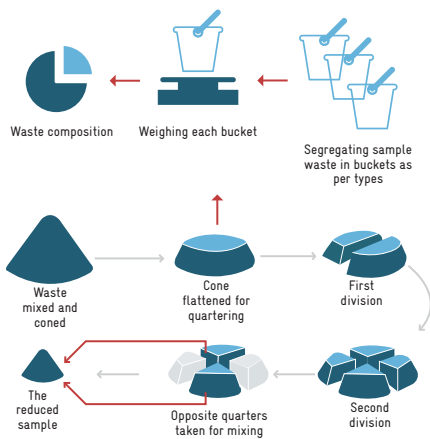
Infinity Box: Launched in 2019, Infinity Box aims to create a circular economy of reusable and recyclable, environment-friendly food packaging containers. The start-up manufactures high-quality, leak-proof polypropylene containers which is used for packaging of food items and gets it delivered to the customers. Following that, the empty container is collected from the customer based on one of four options: 1) To be returned immediately; 2) Schedule a pickup at a different time. 3) Can return when the next order is received. 4) Can also choose to return to the yet-to-be patented smart bin. The QR code embedded containers are easy to track and once the containers are received, they are then properly sterilised, following all the certified washing protocols at selected partner kitchens. Presently, they have partnered with food delivery platforms to provide their services.



5.1.2 COMPLIANCE TO SUP BAN

To reduce waste generation, each of the BWGs needs to comply with the existing National Ban on Single-Use Plastic 2022 in India and the State of Tamil Nadu. Each of the Bulk Waste Generators shall identify the various items banned by the State. This helps to curb the use of identified banned items and eliminate the products from surroundings and environment. The list of banned items by the State Government of Tamil Nadu and the Government of India is already provided in Table on page 17 (List of banned SUP items at the National and State level). In order to reduce the generation of plastics, the BWGs can switch to eco-alternative substitutes that can be used in place of plastics. For reference, the types of plastics and their equivalent substitutes are detailed in the handbook developed by the Tamil Nadu Pollution Control Board:

5.1.3 QUANTIFICATION OF WASTE GENERATION



GIZ India, under the CES marine litter project (2020-2023) conducted a SUP inventurisation study to assess the status of the SUP ban using a standard methodology that can be adopted at the National or State level by CPCB/SPCBs. The methodology outlines an assessment at a fixed time interval (like weekly/monthly/quarterly/half year) to assess the categorisation of waste with volumes and plastic composition, including the SUP ban status and identify a gap in implementation.

More plastic means less marine life.

Plastic threatens many marine species

Banned



Plastic sheet/-cling used for Food Wrapping



Plastic sheet for spreading in dining table



Plastic / Thermocool plates



Plastic coated paper plates



Plastic coated paper cups



Plastic tea cup



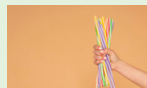
Plastic Thumblers



Thermocool cups



Water pouches packets



Plastic Straws



Plastic Carry bags



Plastic coated Carry bags



Non Woven Polypropylene bag



Plastic bag

Alternatives



Plantain leaves, Lotus leaves, Aluminum foil



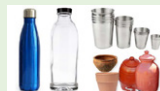
Paper rolls



Areca Nut Plates, Metal Plates, Ceramic Plates



Glass Thumbler, Metal Thumbler, Earthen Pots



Glass Bottles, Metal Containers, Earthen Pots



Paper Straw, Wooden Straw

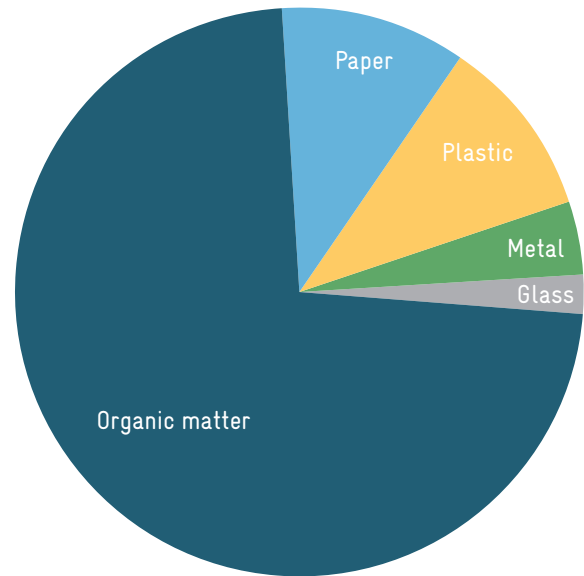


Cloth Paper, Jute Bags



Paper Cloth Flags

The quantity of waste generated in the BWG facility in one day is collected and measured. A quantity of waste is made into a cone (roughly 200 kg or total generated waste, whichever is less), flattened and made into two equal sections by the quartering technique, which is then made into four equal segments. Two opposite sections are discarded, and the other two halves are taken for the next quartering process to achieve a sample size of 50–70 kg. The dry and wet waste should be separated, the plastic waste is separated, and a further 7 types of plastic waste are categorized. The separated plastic wastes are weighed and quantified.



Such assessments at periodic intervals by BWGs such as residential complexes, shopping malls, institutions, hospitals, hotels and others, will help in taking appropriate action in reduction of plastic waste generation and properly handling of the waste. This would also curb the prevalence of single-use plastics and introduce alternatives as a substitute for sustainable consumption.

5.2 BWGs actions: Segregation of Plastic Waste

The first step to segregation is to address the behaviour towards waste segregation at the source. When waste is segregated at source, it facilitates proper channelisation to ensure the right choice of end-of-life disposal. By separating garbage at the source, cities and municipalities could use their labour and infrastructure best while improving the environment. Source segregation lessens the appeal of the current unsanitary, dangerous, and inhumane practice of rag pickers digging through rubbish heaps to recover recyclable waste products. Individuals, whether as part of households or as members of communities or institutions, are the key to source segregation of waste.



The goal is to make it easier for different stakeholders to embrace source segregation techniques in order to have a long-lasting and sustainable impact. Primary waste generators need to be educated and made aware of the importance and advantages of source segregation. Though Tamil Nadu has an inherent tradition of segregating waste (viz. newspapers, milk packets, glass bottles, household cleaning bottles etc.) at source, it is to be noted that this is done only in case of market value waste.

Source segregation suffers because waste segregation is frequently seen as a mental and physical burden. Most people struggle to determine the type of waste (whether it is plastic, fabric, or wood) and which rubbish goes in which dustbin. Proper source segregation is not an automatic, effortless operation rather, it's a conscious effort to be taken by the individual.

5.2.1 ACTIVITIES FOR BEHAVIOUR CHANGE TOWARDS SEGREGATION

Source segregation requires change in behaviour which needs, creating awareness, education and capacity building of the waste generators. Some of the suggested interventions that can be adopted for each type of generator are given below:

	<p>Households/gated communities</p> <ul style="list-style-type: none"> • Door-to-Door campaign • Illustrative pamphlets/awareness campaigns
	<p>Educational Institutions</p> <ul style="list-style-type: none"> • Circulars/notifications to be circulated by the administration/management emphasising source segregation • Rallies/campaigns for the students to become self aware and also educate their families about waste management
	<p>Hotels/Restaurants/Other Bulk Waste Generators</p> <ul style="list-style-type: none"> • Regular meetings with the management • Circulars/notifications to be circulated by the administration & management emphasising source segregation • Regular inspections • Motivation through awards/certifications

5.2.2 DRS SYSTEM

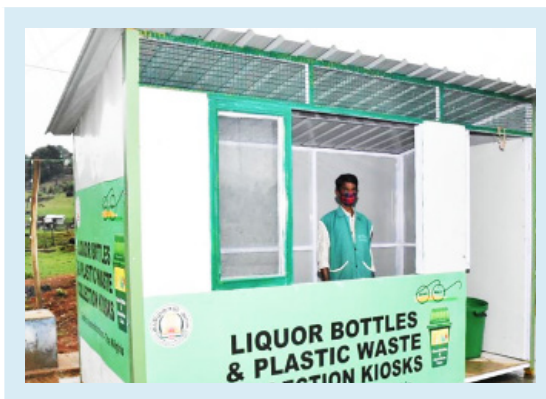
One of the ways to incentivize the waste generators to segregate and contribute to recycling is Deposit Refund System (DRS). A deposit-refund system combines a tax on product consumption with a rebate when the product or its packaging is returned for recycling or appropriate disposal. The DRS allow consumers to be paid for doing their part in the collection mechanism, having them deliver the plastic articles and more back to where they bought them. This would also inculcate the habit of source segregation and recycling. The container/article can then be recycled. DRS is an application of the 'polluter pays' principle. DRS can be used to ensure the recycling of PET bottles, beverage cans and such. The mechanism involved in DRS is simple. An additional cost is levied on an item when sold, and the consumer will be rebated the extra amount paid either in terms of money/coupons post consumption and return of the same through a take-back mechanism; like Reverse Vending Machine (RVM), Collection points or similar systems enabled by QR code. This system nudges the consumers to deposit the item post-consumption through incentivisation, which helps increase recycling/reuse. They contribute to recycling materials and reducing the need for raw materials to make new beverage containers. Some benefits of DRS are -

- It can be accommodated in public places like schools, colleges, office buildings etc.
- Because the system collects the recyclable materials (plastic, glass, and aluminium) rather than manual sorting, so they make managing the recyclables simple.
- It requires less space to hold segregated plastic.
- Location specific incentives, such as coupons, can be provided.



Three reverse vending machines (RVMs) were inaugurated in Hyderabad under the “Enhancing Circular Economy Perspectives – Plastic Waste Management Strategy and Action Plan for Greater Hyderabad Municipal Corporation” project, supported by the IGES Centre Collaborating with UNEP on Environmental Technologies (IGES-CCET) Japan, with ICLEI South Asia as the implementation partner. People can deposit waste PET bottles in the RVM and receive rewards in the form of cashback or discounts on bus tickets. The bottles would undergo pre-processing inside the machine and later get converted into clothing items such as T-shirts and caps.

Photo credit: ICLEI South Asia



The Tamil Nadu State Marketing Corporation (TASMAC) implemented a buyback scheme in the Nilgiris District starting May 2022 for empty liquor bottles. The project was aimed at protecting the wildlife since the empty liquor bottles posed a threat to them. Under this buyback scheme, an extra amount of Rs. 10 is placed above the maximum retail price for each bottle. This amount would be repaid to the user once the return is made. Through this scheme, from November 2022 to January 2023, nearly 95% of bottles were bought back.

5.3 BWGs action: Storage of Plastic Waste

Storage is a much needed and a mandatory practice for proper and systematic approach of solid waste management and a priority to Bulk waste generators. Category wise storage with proper container and implementing colour coding system is essential for protecting and ensuring that the premises are clean for all the Bulk waste generators. Additionally, upholding and adopting the best practices for waste management is crucial for ensuring proper storage techniques, along with the wellbeing of surrounding and the hygiene safety.

¹ According to the Plastic Waste Management Rules, 2016, “bulk waste generators are to segregate waste at source, store the plastic, hand over segregated waste and pay user fee as per byelaws of the local bodies”. Bulk waste generators as per MSWM Rules 2016 ² are

- Segregate and store the waste generated in three separate streams namely
 - Bio-degradable (Wet Waste) - GREEN Container
 - Non-biodegradable (Dry Waste) - BLUE Container
 - Domestic hazardous wastes - RED Container
- Process the bio-degradable Waste (Wet Waste) within the premises itself and develop a system for reuse of products or processing through bio manure/ biogas unit etc.,
- Handover segregated dry wastes to Urban Local Body (ULB) waste collector, or any recycling agency/vendors authorised by ULB to collect waste on its behalf as per the direction or notification by the local authorities from time to time.
- In addition to the above, bulk waste generators are required not to mix E-waste - it should be separately stored as and when generated and handed over to an authorised e-waste recycling agency once the quantum is reached high.

It is also suggested for Bulk waste generators to have secondary storage for plastic waste in their premises, if possible, from where quantum of plastic waste once gathered, could be channelised further.

5.4 Forward Linkages for plastic waste

For sustainable waste management, it is important that forward linkages are established so that plastic waste management systems reach its full potential. Every actor in the value chain is considered and encouraged to have an active role to contribute to a robust system. Efforts with involvement of Producers, Importers and Brand Owners (PIBOs) from EPR prospects may lead to a sustainable model of waste management. EPR acts as a financial instrument to incentivize better collection, sorting and recycling till end-of-life disposal thus minimising waste reaching the landfill. The players in the waste stream are engaged actively and enabled to comply to their business operations as well as upholding responsibility towards the environment.

5.4.1 CHANNELISING FOR RECYCLING: INFORMAL AND FORMAL PERSPECTIVE

The formal and informal sector actors drive the entire operations and management of the waste and support its channelisation for further processing – Recycling, End of life disposal and dumping at landfill etc. In several cities across India, the primary collection is driven by informal sector. The formal sector is often deployed through contracting with a private agency or municipality own infrastructure which collects, sorts, transports and disposes of different types of waste. The informal sector actors are the passive actors working to pick, collect and channelize waste. Still the role of informal waste sector is under played as they are vulnerable and informally involved in the value chain.

By engaging with formal and informal sector, BWGs help to facilitate management of waste from the premises. It is important that the BWG can especially coordinate with local informal waste management sector so as to enhance the processing capacity, ensure decent working conditions and capture major share of plastic waste for processing. Across India, formal and informal sectors work hand in hand to ensure better waste management in cities and villages. Hence, BWGs have enhanced opportunity to increase better channelisation of waste for recycling and reduce the quantum of littering and also waste reaching landfill.

5.4.2 ENGAGING UNDER EPR

EPR for plastic packaging in India enables active participation of various actors in the value chain, as it incentivizes effective collection, sorting, storing and channelisation of recyclables. The system considers the crucial role of different types of plastics, its reuse potential into the value chain and end of life disposal. The BWG may involve the PIBOs in their facility/campus if it's a Mall/commercial complex to fund the collection, sorting and recycling of the plastic waste. If not a commercial facility, the BWG may operationalize a proper plastic waste management **system** and exchange the recyclables to a Plastic waste processor (PWP) to generate EPR credit, which could be further traded to a PIBO (Producers, Importers and Brand Owners).



5.4.3 DISPOSAL

BWGs shall ensures proper disposal as it caters to recycling, reuse of selected products and reuse of recycled content and end of life disposal like waste to energy (plastic Waste for generation of energy

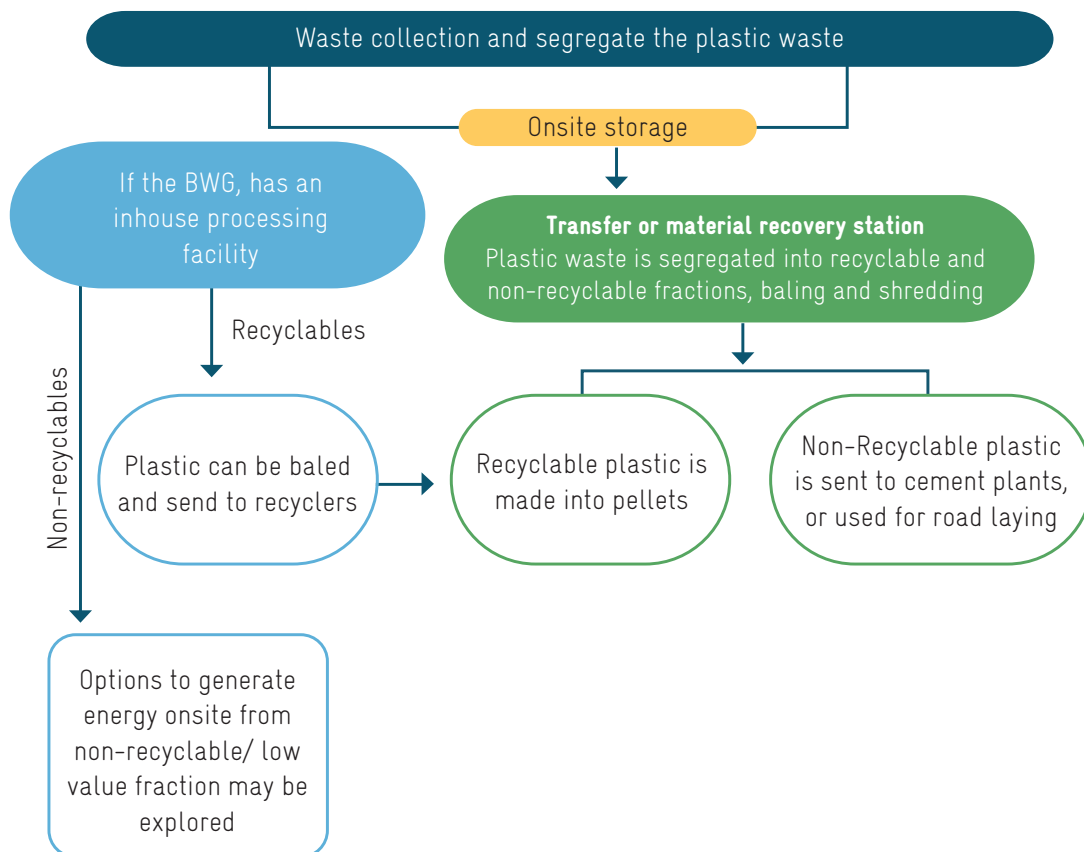
including co-processing (in the cement kilns). BWGs can also explore decentralised disposal through the technologies on plastic to energy, where the recovered energy can be used for cooling or heating purpose. However, for same, a thorough study and feasibility shall be checked.

Processing waste on-site cuts down the following:

- waste quantum through shifting to reusable materials, refillable water bottles/ containers (at the organisation level)
- unnecessary stress on roads for transportation of waste
- emissions to air, due to less transport
- land requirements by ULBs (which is already in shortage).

5.5 Step-by-Step Action Plan for the Bulk Waste Generator:

Bulk waste Generators need to develop the action plan with the 3 R approach (Reduce, Reuse, Recycle) as per details provided in sections 5.1 to 5.4. The focus should be to reduce the waste generation at premises followed by practices for reuse and recycle.



All the BWGs should have dedicated personnel to manage the waste on the premise, starting from source segregation to disposal. They should explore methods and best practices to improve the effectiveness of management.

BWG must plan the entire waste management operations to oblige PWM rules and a benefit under the EPR framework. The BWG may involve the PIBOs in their facility/campus if it's a Mall/commercial complex to fund the collection, sorting and recycling of the plastic waste. If not a commercial facility, the



BWG may operationalize a proper plastic waste management system and exchange the recyclables to a Plastic waste processor (PWP), who can generate EPR credit, which PWP could further traded to a PIBO (Producers, Importers and Brand Owners).



Tips to improve Recycling

- Use of easily recyclable products
- Proper source segregation
- Cleaning contaminated plastics before disposing
- Avoiding non recyclable products and opting for eco alternatives

Any BWG should put in place a clear mechanism to source segregate the waste as wet, dry and hazardous waste. The waste management workers should clear the segregated waste regularly and transport it to the material recovery facility. The recovered recyclables would be stored in separate bins/packs to reach the registered plastic waste processors. This waste is further channelled as designated plastic types into different streams of recycling/upcycling, end-of-life disposal, and co-processing.

The BWGs, through the PIBOs participation may ensure dignified working conditions and better employment opportunities and wages. Through this, the waste workers may work for increased collection, segregation and recycling for the plastics in the waste stream. This systematic planning and operations of the BWGs would ensure traceability, accountability and transparency of the plastics waste in the system. The BWGs need to prepare a plan as per Annexure I, based on following:

A. ELIMINATION OF SINGLE-USE PLASTIC FROM THE PREMISES

1. Generate awareness of identified ban on single-use plastic to all the relevant entities, stakeholders, and personnel within the premises.
2. Include the Information, Education and communication materials on single-use plastic at all prominent places.

B. STRENGTHENING RESOURCE RECOVERY FROM WASTE TOWARDS ZERO WASTE PREMISES.

1. Removal of banned items, use of alternatives, and promotion of refillable models
2. Ensure the minimum three-bin colour coded system with necessary communication material at premises based on the characteristic of waste generated.
3. Identify the key actors for training on segregation and waste management – such as residents, staff involved in waste management, etc.

4. Establish the wet waste management system at the premises with the delegation of responsibility for its O&M.
5. Establish reverse logistic options for waste streams, if applicable. Designate an area within the premises for storage and sorting of recyclable items.
6. Establish linkages with registered waste pickers and recyclers for the recycling of streams identified as recyclables.
7. On-site facilities for domestic hazardous (sanitary napkins, diapers etc.) or linkage with waste management collectors or agencies as directed by local authorities.

C. PROVISION TO MAINTAIN THE RECORD AS PER THE TABLE BELOW

Date	Waste collected (Kg/Day)	Wet waste (kg/Day)	Compost/Biogas produced (Unit/day)	Recyclable (Kg/Day)	Plastic generated (Kg/Day)

5.6 Awareness and Outreach for effective PWM by BWGs

Community buy-in is essential to sustainable and environment-friendly plastic waste management. This will include a key focus on behaviour change, which takes place through consistent messaging, developing IEC material, and implementing community and business-led campaigns.

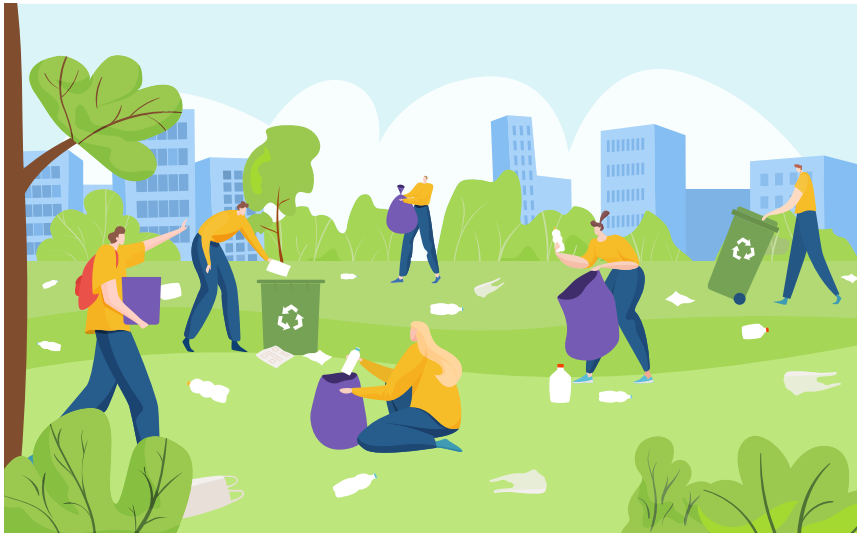


ROKA – Residents of Kasturbanagar Association – a resident welfare association based in Chennai, zone 13, is actively involved in sustainable solid waste management for the past 4 years.

Through their dynamic work and with support from Greater Chennai Corporation officials, ROKA has contributed in achieving a good level of segregation in Kasturba Nagar. The welfare association has also driven the importance of segregation to citizens across the city through awareness campaigns, pledges, rallies etc. They have conducted collection drives that has helped in diverting nearly 12 tonnes of E – Waste and 31 tonnes of clothes, footwear and mattresses from landfills. The association is also working with and adopting schools and other institutions for implementing good solid Waste Management practices.

The BWG must also consistently monitor programme progress and undertake concurrent evaluation of measures implemented. Key steps that can be implemented and monitored by BWGs include:

- i. Develop an implementation strategy across the organisation to enforce sustainable waste management practices. This process shall involve consultation with all employees, temporary staff, vendors, waste management companies, municipal/ local body authorities.



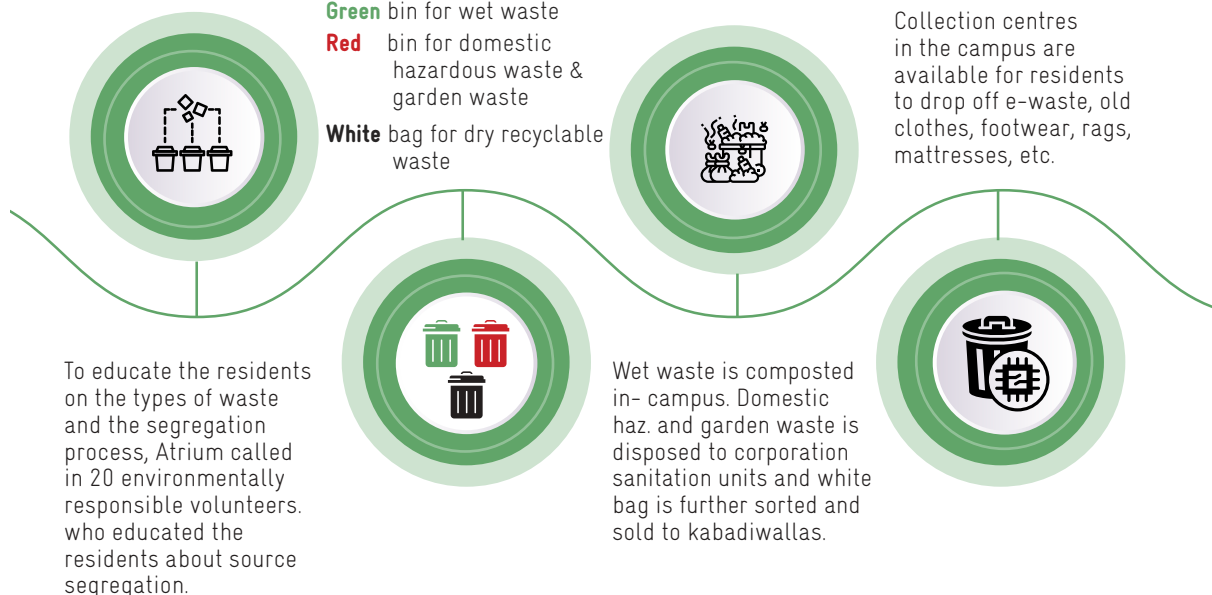
To create and sustain a streamlined waste management system, it is necessary to involve communities and public. Such involvement would encourage accountability of the individuals, tracing of waste, proper segregation, proper utilisation of recyclables & reusables etc.



Residents were provided with a green bin, a red bin and white bag to all 187 apartments.

- Green** bin for wet waste
- Red** bin for domestic hazardous waste & garden waste
- White** bag for dry recyclable waste

Collection centres in the campus are available for residents to drop off e-waste, old clothes, footwear, rags, mattresses, etc.



To educate the residents on the types of waste and the segregation process, Atrium called in 20 environmentally responsible volunteers, who educated the residents about source segregation.

Wet waste is composted in- campus. Domestic haz. and garden waste is disposed to corporation sanitation units and white bag is further sorted and sold to kabadiwallas.

- ii. Train the organisation's members on adopting 'waste-free', 'waste less' approaches and promote waste segregation. The organisation with due consultation of waste management companies (public/ private) and /or local body departments must decide on adopting how many types of segregation of classification of waste must happen within the boundaries of the waste generator.
- iii. Identify leaders/ change makers within the organisation who can influence the employees and others on effective waste management operations.
- iv. Coordinate with all collection agencies and streamline waste management.
- v. Actively participate in state programs and municipality programs on waste management.
- vi. Regularly collect, consolidate, and report the baseline data on waste management (Total collection, segregation, transportation, disposal/treatment).
- vii. The organisation shall develop communication material including awareness posters for employees, customers, and other stakeholders to propagate ideas related to sustainable waste management (Few examples of awareness posters are given as Annexure 2).

Annexures

Annexure 1: Template for preparing a step-by-step action plan for Bulk waste generator.

1. **Type of Entity:** Residential/ Commercial/ Institution – Public / Institute –Private/ Other (Mentioned)
2. **General Details:**

Waste Generated within premises (Kg/Day)	Wet waste (kg/Day)	Compost/Biogas produced (Unit/day)	Recyclable (Kg/Day)	Plastic generated (Kg/Day)

3. **Checklist:**
 - a. Events/meetings on the ban of identified Single Use plastic (Yes/No)
 - b. Communication material is available at prominent places on SUP ban (Yes/No)
 - c. Provision of three bin system across the premise (Yes/No)
 - d. Area identified for storage/sorting of recyclables (Yes/No)
 - e. Training conducted:
 - Primary Segregation (Yes/No)
 - Secondary sorting (yes/No)
 - On-site wet waste management (Yes/No)
 - On-site Sanitary waste management (yes/No)
4. **Strategy to reduce waste.**

Provision of communication material to reduce the usage	List of Alternatives adopted on premises	Products adapted with refillable strategy

5. **Provision of wet waste management system (fill the relevant sections only)**

Compost (Capacity- Kg/Day)	Biogas (Feed Capacity – Kg/day)	Other (...)	Details on O & M (Human resource engaged etc.)

6. **Dry Waste Management (fill the relevant sections only)**

Waste streams identified for Reverse logistics such as DRS	Waste stream identified for reverse logistics such as DRS system	Mapping of waste pickers/ recyclers with contact details	Details on O & M (Human resource engaged etc.)

7. **Any other relevant details**

Annexure 2: Checklist For Periodic Verification Of Premises Of Bulk Waste Generators By Urban Local Body

S No	Activities	Yes / No
1.	Is bulk waste generator segregating the municipal solid waste as per SWM Rules, 2016	
2.	Are all the Segregated wastes being stored in separate bins, containers or bags etc.?	
3.	Has the bulk waste generator demarcated a separate space for the segregation, storage and decentralised processing of municipal solid waste in society, RWA, gated community, market association, etc.?	
4.	Is the bulk waste generator storing separately the Construction and Demolition waste?	
5.	Is the bulk waste generator storing the Garden and Horticulture waste separately?	
6.	Is the bulk waste generator burning any waste?	
7.	Is the bulk waste generator burying any waste?	
8.	Is the bulk waste generator paying user fee/charges for solid waste management	
9.	Is the bulk waste generator intimating the urban local body / authority in case of organising an event or gathering of more than 100 persons at any of unlicensed premises?	
10.	Is the bulk waste generator handing over recyclable waste to the authorised waste picker or recycler?	
11.	Is the bulk waste generator processing bio-degradable (wet) waste in own premises?	
12.	If so, what is the process – composting or bio-methanation or any other? Please mention.	
13.	Is the bulk waste generator handing over the residual waste from process to the waste collector or agency designated by Urban local authority?	
14.	Is the waste collection organised by RWA, Association?	
15.	If so, is the waste collector an informal rag picker / waste collector?	
16.	Is the Payment to the waste collector made by the association or by the waste generators/premises owners directly?	
17.	Whether the association/complex is using waste collection personnel provided by the Urban local body?	
18.	Is the RWA /Association organising IEC activities for proper management of municipal solid waste?	
19.	Has the bulk waste generator tied up for authorised agency for collection of segregated waste?	

Annexure 3: Examples of Awareness posters on plastic waste management.

WHAT IS EPRR
Extended Producer Responsibility

It's the obligation of producers to ensure environmentally responsible disposal of their products, post usage and to incorporate the processing and disposal strategy into the very blueprint and promote eco-design strategies to minimise potential negative environmental impact throughout the product life cycle.

Production → **Sales** → **Consumption** → **Disposal** → **Recycle and Reuse** → **Production**

HAPPY BEGINNING + HAPPY ENDING
= GOOD PRODUCER, GOOD PRODUCT, GOOD CONSUMER!
= GOOD (Responsible) PRODUCER, GOOD (Sustainable) PRODUCT,
INFORMED (Responsible) CONSUMER

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WASTED!

India alone generates about 1.5 lakh tonnes of waste per day. In most developing nations, including India, the majority of waste collection and its management is carried out by the informal sector.

Source: CPCB

At present, there are more than 40 lakh waste pickers in India. Waste, when managed incorrectly, leads to:
Contamination of air, water, and soil

Diseases such as respiratory issues, skin problems, and even developmental delays in babies.

The spread of infectious air-borne and water-borne diseases, like Tuberculosis, Tetanus, Whooping cough, Typhoid, Cholera, HIV, and Hepatitis.

Informal sector (rag pickers, kabadiwalas, scrap dealers) helps us manage our waste & complements the formal sector of waste management.

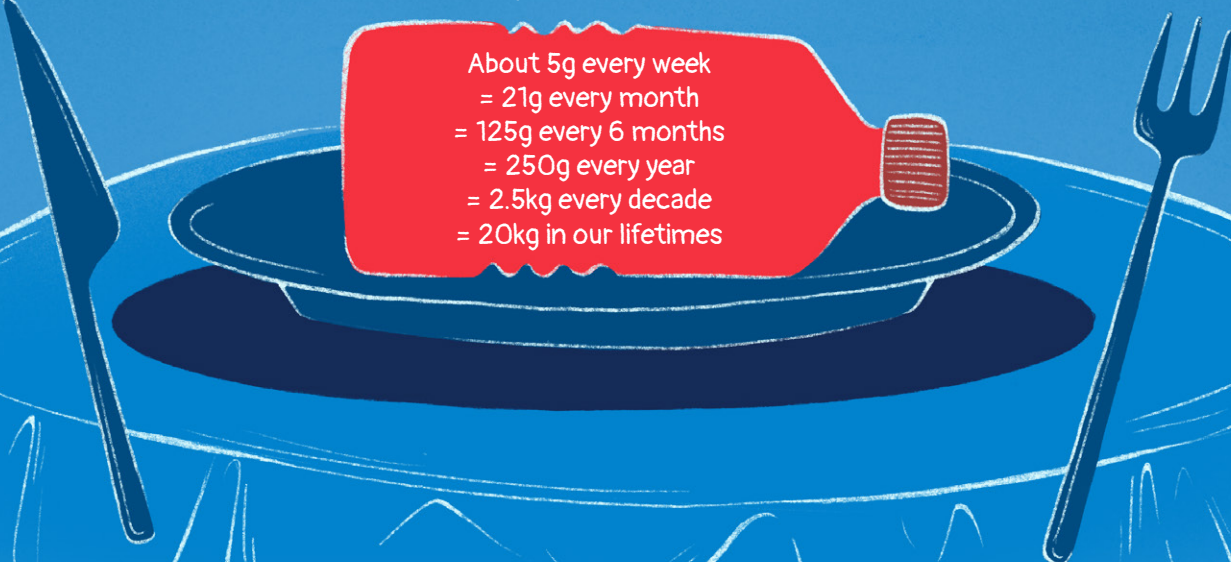
DO THIS:

- Properly segregate your waste before disposal.
- Keep separate bins for dry and wet kitchen waste – some dry waste can be recycled and most of the wet waste can be composted.
- Discard sanitary waste separately and if possible, mark the bag for easy identification.



CAUSE AND EFFECT

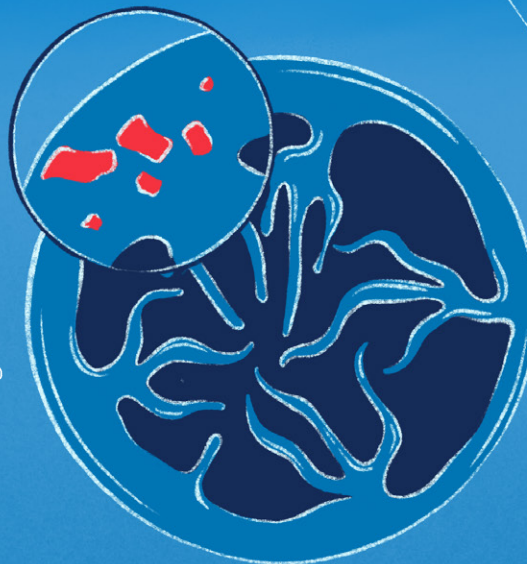
HOW MUCH PLASTIC ARE YOU EATING EVERY WEEK?



About 5g every week
= 21g every month
= 125g every 6 months
= 250g every year
= 2.5kg every decade
= 20kg in our lifetimes

A research study has found microplastics in the placenta of unborn babies!

Source: Environment International, 2020



The presence of microplastics was detected in a human placenta for the first time, in all portions of the placenta – the maternal, fetal, and amniochorial membranes.

"IT'S LIKE HAVING A CYBORG BABY!"

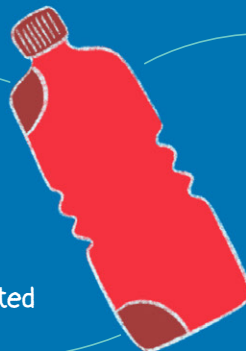
DID YOU KNOW?



OF THE TOTAL PLASTIC WASTE EVER PRODUCED,

Only 9% has been recycled

about 12% incinerated



remaining 79% has ended up in dumps, landfills, our waterways and oceans.



8 MILLION TONNES OF PLASTIC END UP IN THE WORLD'S OCEANS EVERY YEAR.

IF CURRENT TRENDS CONTINUE, OUR OCEANS COULD CONTAIN MORE PLASTIC THAN FISH BY 2050.

Source: Ellen MacArthur Foundation

ALTERNATIVES TO SUP

DITCH



SINGLE-USE PLASTIC BAGS



PACKAGED DRINKING WATER

Plastic bottles release harmful chemicals into water when exposed to conditions like direct sunlight or if it is in prolonged use.



SINGLE-USE PLASTIC STRAWS

Plastic straws are a great threat to marine life.



TEA BAGS

Tea bags contain high quantities of microplastic. You ingest this microplastic with every cup of your favourite tea. Upon discarding, these end up in the landfills or waterways, and ultimately, in our oceans, from where it enters the food chain.



SHAMPOO AND CONDITIONER PACKAGED IN PLASTIC BOTTLES

Other than plastic packaging, almost all shampoos contain sulphates, which are harmful for both, you and for the environment.



INSTEAD, OPT FOR

REUSABLE CLOTH BAGS

Cloth bags are biodegradable, environment friendly and a sustainable option. Also lesser trash, more durable, and economical.



CARRY YOUR OWN REFILLABLE WATER BOTTLE

Switch to reusables e.g. - bottles made of food-grade plastic/ stainless-steel/ copper



REUSABLE SILICON OR STAINLESS-STEEL STRAWS, EDIBLE STRAWS MADE OF WHEAT PASTA STRAWS

Reusable, biodegradable, and edible straws eliminate these negative impacts. Also lesser trash, more durable, and economical.



TEA LEAVES

Using loose tea leaves eliminates all these negative impacts. And upon usage, the leaves can be composted, and/or added to your house plants to provide them with extra nourishment. Double win!



NATURAL SHAMPOO SUCH AS SOAPNUT PACKAGING-FREE SHAMPOO AND CONDITIONER BARS

Opting for natural, sulphate-free alternatives protects your hair and thus your health. As a bonus, you also contribute positively towards the betterment of the environment.



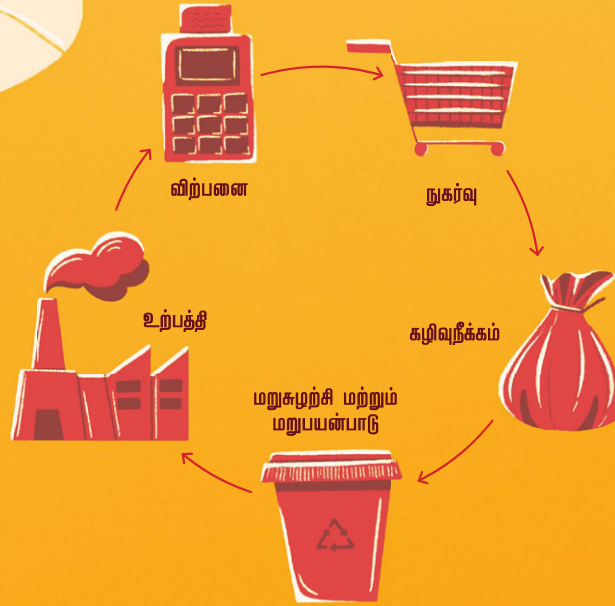
சுற்றுச்சூழல், காலநிலை மாற்றம்
மற்றும் வனத்துறை

EPR

என்றால் என்ன?

நீட்டிக்கப்பட்ட உற்பத்தியாளர் பொறுப்பு

நீட்டிக்கப்பட்ட உற்பத்தியாளர் பொறுப்பு என்ற கருத்தாக்கமானது, உற்பத்திப் பொருட்களின் கழிவு நீக்கத்திற்கு அவற்றை உற்பத்தி செய்த நிறுவனங்களைப் பொறுப்பாக்குகிறது. இதன்மூலம் சுற்றுச்சூழலுக்குப் பாதிப்பு ஏற்படுத்தும் உற்பத்திப் பொருட்களைக் கைவிட்டுக் கூழலுக்கு உகந்த, நீடித்து உழைக்கக்கூடிய மறுசுழற்சி செய்யத்தக்க, எளிதில் பாதுகாப்பாகக் கழிவுநீக்கம் செய்யத்தக்கப் பொருட்களை உற்பத்தி செய்வதும், உற்பத்திப் பொருட்களின் கழிவு நீக்கத்தில் பங்களிப்பதும் உற்பத்தியாளர்களின் பொறுப்பாகிறது.



மகிழ்ச்சியானத் தொடக்கம் + மகிழ்ச்சியான முடிவு = நியாயமான உற்பத்தி,
கூழலுக்கு இசைவானப் பொருள், நல்ல நுகர்வோர்
= நியாயமான (பொறுப்புள்ள) உற்பத்தியாளர், நல்ல (கூழலுக்குகந்த) பொருள்,
புத்திசாலி (பொறுப்புள்ள) நுகர்வோர்



சுற்றுச்சூழல், காலநிலை மாற்றம்
மற்றும் வனத்துறை

வீணாக்குதல்!

ஒவ்வொரு நாளும் இந்தியா மட்டும் 1.5 இலட்சம் மெட்ரிக் டன் கழிவுகளை உருவாக்குகிறது. இந்தியா உட்பட பெரும்பாலான வளரும் நாடுகளில் இந்தக் கழிவுகளின் பெரும்பகுதி முறைசாராத் தொழிலாளர்களால் கையாளப்படுகின்றன. ஆதாரம்: CPCB

தற்போது இந்தியா முழுவதும் 40 லட்சம் குப்பை பொறுக்குவோர் இருக்கின்றனர். கழிவுகள் சரியாக மேலாண்மை செய்யப்படவில்லையென்றால் நீரையும், நிலத்தையும், காற்றையும் மாசுபடுத்துகின்றன.

சுவாசக் கோளாறுகள், தோல்நோய்கள் மற்றும் குழந்தைகளிடம் வளர்ச்சிக் குறைபாடு போன்ற நோய்களை இவை உருவாக்குகின்றன.

நீரின் மூலமும் காற்றின் மூலமும் பரவும் நோய்களான காசநோய், டெட்டனஸ், டைபாய்டு, வயிற்றுப்போக்கு, கக்குவான் இருமல், ஹெப்படைடிஸ் மற்றும் எச்ஐவி போன்ற நோய்களைப் பரப்புகின்றன.

முறைசாராத் தொழிலாளர்கள் (குப்பைப் பொறுக்குபவர்கள், பழைய பொருட்களை வாங்குபவர்கள், காய்லான் கடை வியாபாரிகள்) நம்முடைய குப்பையை மேலாண்மை செய்வதில் முக்கியப் பங்கு வகிக்கின்றனர்.

இதைச் செய்யுங்கள்:

- குப்பையில் போடும் முன்பு உங்கள் கழிவுகளை 'மக்கும்-மக்காத' கழிவுகள் என்று முறையாகத் தரம் பிரிப்புகள்.
- சமையலறையின் ஈரமான கழிவுகளைத் தனியாக ஒரு குப்பைத் தொட்டியில் போடுங்கள். அவற்றைப் பெரும்பாலும் மடக்க செய்து உரமாக்க முடியும். இவைகளைத் தவிர்ந்து மற்றக் கழிவுகளை மறுகழற்சி செய்ய முடியும்.
- முழந்தவரையில் டயர்கள், சாஸிட்டரி நாப்பின்கள் போன்ற மனிதக் கழிவுகளை தனியாகப் பிரித்து அடையாளம் காணத்தக்க பைகளில் பாதுகாப்பாகக் கழிவுநீக்கம் செய்யுங்கள்.



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On behalf of:

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Environment, Nature Conservation
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of the Federal Republic of Germany

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 SWECHHA

மீண்டும்
மஞ்சப்பை



சுற்றுச்சூழல், காலநிலை மாற்றம்
மற்றும் வனத்துறை

காரணங்களும் விளைவுகளும்

ஓவ்வொரு வாரமும் நீங்கள் எவ்வளவு பிளாஸ்டிக்கை உண்கிறீர்கள்?

வாரத்துக்கு 5 கிராம் வீதம் ஓவ்வொரு மாதமும்
சுமார் 21 கிராம்
ஆறு மாதங்களில் 125 கிராம் என வருடத்தில்
250 கிராம்
பத்து வருடத்தில் 2.5 கிலோ என உங்கள்
வாழ்நாளில் சுமார் 20 கிலோ

தாயின் வயிற்றிலிருக்கும்
குழந்தையின் தொப்புள்
கொடியில் நுண்ணெகிழி
(மைக்ரோ பிளாஸ்டிக்)
இருப்பதை ஒரு ஆய்வு
கண்டறிந்துள்ளது.
ஆதாரம்: Environment
International, 2020



தாயின் உடலிலும், சிசுவின்
உடலிலும், தொப்புள் கொடியிலும்
நுண்ணெகிழி (மைக்ரோ
பிளாஸ்டிக்) இருந்ததை இந்த
ஆய்வு கண்டுபிடித்திருக்கிறது.
மேலும் சமீபத்தில் இன்னொரு
ஆய்வு பெரும்பாலானோரின்
இரத்தத்தில் நுண்ணெகிழி
இருப்பதையும்
கண்டுபிடித்திருக்கிறது.

நம் குழந்தைகள் வெறும் இரத்தத்தாலும் சதையாலும்
ஆனவர்கள் அல்ல; மாறாக நச்சு பிளாஸ்டிக்காலும்
உருவாக்கப்பட்டிருக்கிறார்கள்.

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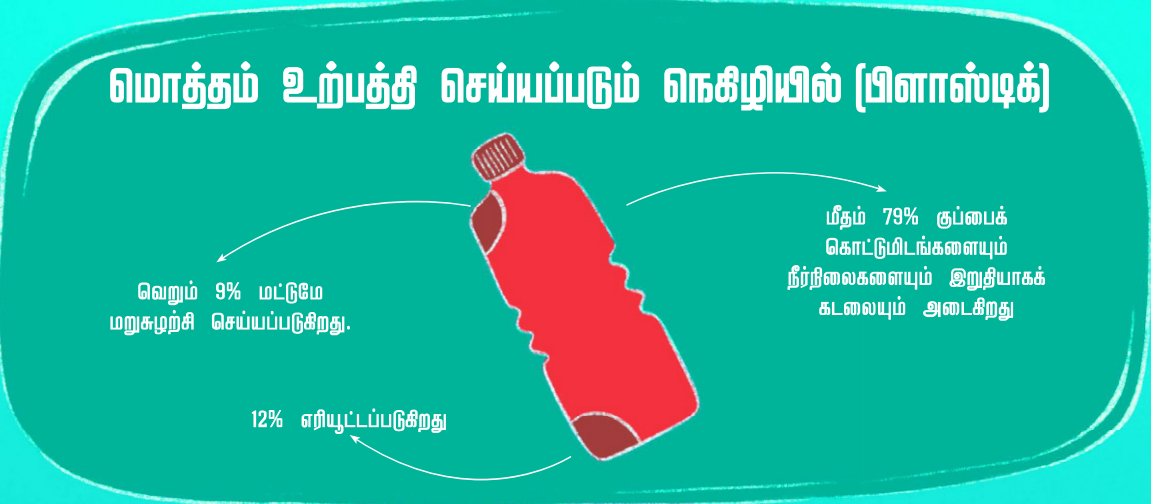
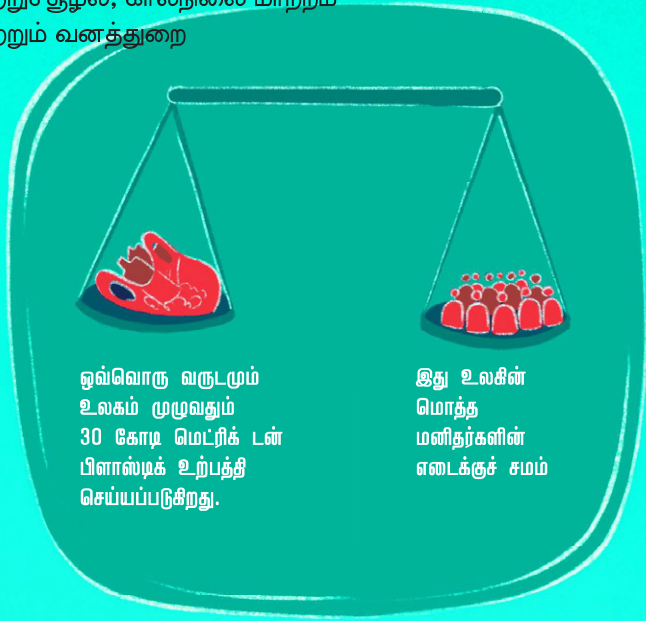
In partnership with  SWECHHA

மீண்டும்
மஞ்சப் பைய



சுற்றுச்சூழல், காலநிலை மாற்றம் மற்றும் வனத்துறை

உங்களுக்குத் தெரியுமா?



ஒவ்வொரு வரடமும் 80 லட்சம் மெட்ரிக் டன் பிளாஸ்டிக் உலகில் உள்ள கடல்களை அடைகிறது.

இப்படியே தொடர்ந்தால் 2050ஆம் ஆண்டில் கடலில் மீன்களைவிட பிளாஸ்டிக்தான் அதிகமாக இருக்கும்.

ஆதாரம்: என் மெக் ஆர்தர் பலண்டேஷன்



சுற்றுச்சூழல், காலநிலை மாற்றம்
மற்றும் வனத்துறை

ஒற்றை பயன்பாட்டு நெகிழிக்கு (பிளாஸ்டிக்) மாற்றுப் பொருட்கள்

தவிர்க்க வேண்டியவைகள்



ஒற்றை பயன்பாட்டு
நெகிழிப்(பிளாஸ்டிக்) பை



பாட்டில் குடிநீர்:
பிளாஸ்டிக் பாட்டில்கள் கூரிய ஓளியில்
கூடாகும்போதும் நீண்ட காலம் தொடர்ந்து
பயன்படுத்தும்போதும் நச்சுக்களை நீரில்
கசியச்செய்கின்றன.



ஒற்றை பயன்பாட்டு பிளாஸ்டிக் ஸ்ட்ரா:
இவை கடலுயிர்களுக்கு மிகவும்
ஆபத்தானவை



டீ பைகள்:
டீ பைகளில் ஏராளம் நுண்ணெகிழி (மைக்ரோ
பிளாஸ்டிக்) இருக்கின்றது. ஒவ்வொரு டம்ளர்
டீ அருந்தும்போதும் ஏராளம் நுண்ணெகிழித்
துகள்களை நாம் உண்கிறோம். இவற்றைத்
தூக்கியெறியும்போது இவை நீர்நிலைகளை
அடைந்து உணவுச் சங்கிலி மூலம் மீண்டும்
நம்மை அடைகின்றன.



பிளாஸ்டிக் பாட்டில்களில் விற்கப்படும்
ஷாம்பூ மற்றும் கண்டிஷனர்கள்:
பிளாஸ்டிக் கைத் தவிர்த்து எல்லா
ஷாம்பூக்களிலும் சல்பேட்டுகள் எனப்படும்
வேதிப்பொருள் இருக்கின்றன. இது
உங்களையும் சுற்றுச்சூழலையும்
பாதிக்கக்கூடியவை.



மாற்றுப் பொருட்கள்

உறுதியான சணல், துணிப்பைகள்:
இவை மடக்கக்கூடியவை,
கூழலுக்குப் பாதுகாப்பானவை, குறைவான
குப்பையை உருவாக்குபவை, நீடித்து
உழைப்பவை, பாதுகாப்பானவை மற்றும்
மலிவானவை.



வீட்டிலிருந்தே கொண்டு செல்லும்
மீண்டும் பயன்படுத்தத்தக்க
பாட்டில்கள்: மீண்டும் மீண்டும்
தொடர்ந்து பயன்படுத்தக்கூடிய உலோகப்
பாட்டில்கள் அல்லது கண்ணாடி
பாட்டில்கள் கூழலுக்குப் பாதுகாப்பானவை.



வாயிருக்கும்போது உறிஞ்ச
ஸ்ட்ரா எதற்கு?
தேவைப்பட்டால் மட்டும் தன்மையுள்ள
மரம் அல்லது தானியங்களால்
செய்யப்பட்ட ஸ்ட்ராவையோ அல்லது
உலோக ஸ்ட்ராவையோ பயன்படுத்துங்கள்



டீ அருந்துவது ஒரு அத்தியாவசியத்
தேவையாக இல்லையெனில் தவிருங்கள்.
டீ பைகளைத் தவிர்த்து, முடிந்தால்
பிளாஸ்டிக் கிழிப் பொதியப்படாத டீ இலைகளை
பயன்படுத்துங்கள். இந்த இலைகளை
பயன்படுத்தியபின் நேரடியாகவோ அல்லது
மடக்கச் செய்தோ உரமாக மாற்ற முடியும்.



ஷாம்பூவுக்கு மாற்றான இயற்கைப்
பொருட்களான சீயக்காய், பூந்திக்கொட்டை
போன்ற பிளாஸ்டிக் பொட்டலங்கள் இல்லாத
பொருட்களைப் பயன்படுத்துங்கள்:
சல்பேட் சேர்க்கப்படாத இயற்கைப்
பொருட்களைப் பயன்படுத்துவதன் மூலம்
உங்களையும் சூழலையும் பாதுகாத்தீடுங்கள்!

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