



# ST ALOYSIUS (Deemed to be University) MANGALORE



## SOLID WASTE MANAGEMENT



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## What is Solid Waste????

Solid waste refers to any unwanted or discarded materials that are not liquid or gaseous

Solid waste management denotes the systematic control of the generation, storage, collection, transportation, processing, and disposal of solid waste.

# Importance of Proper Waste Management

**Environmental Protection:** Proper waste management helps reduce pollution, prevents the contamination of air, water, and soil, and protects natural ecosystems

**Public Health:** Mismanaged waste can lead to the spread of diseases. Accumulated waste attracts pests and pathogens, increasing the risk of illness.



# Importance of Proper Waste Management

Resource Conservation: Recycling and composting can conserve resources by reducing the need to extract new raw materials



# Objectives

**Understanding different types of waste**

**Methods for waste treatment**

**Sustainable waste management practices**

# Understanding Different Types of Waste

Biodegradable Waste

Non Biodegradable Waste

Hazardous Waste

E-Waste

# **CONTENTS**

**Types of Solid Waste**

**Sources of Solid Waste**

**Challenges in Waste Management**

**Waste Disposal Methods**

**Impact of Poor Waste Management**

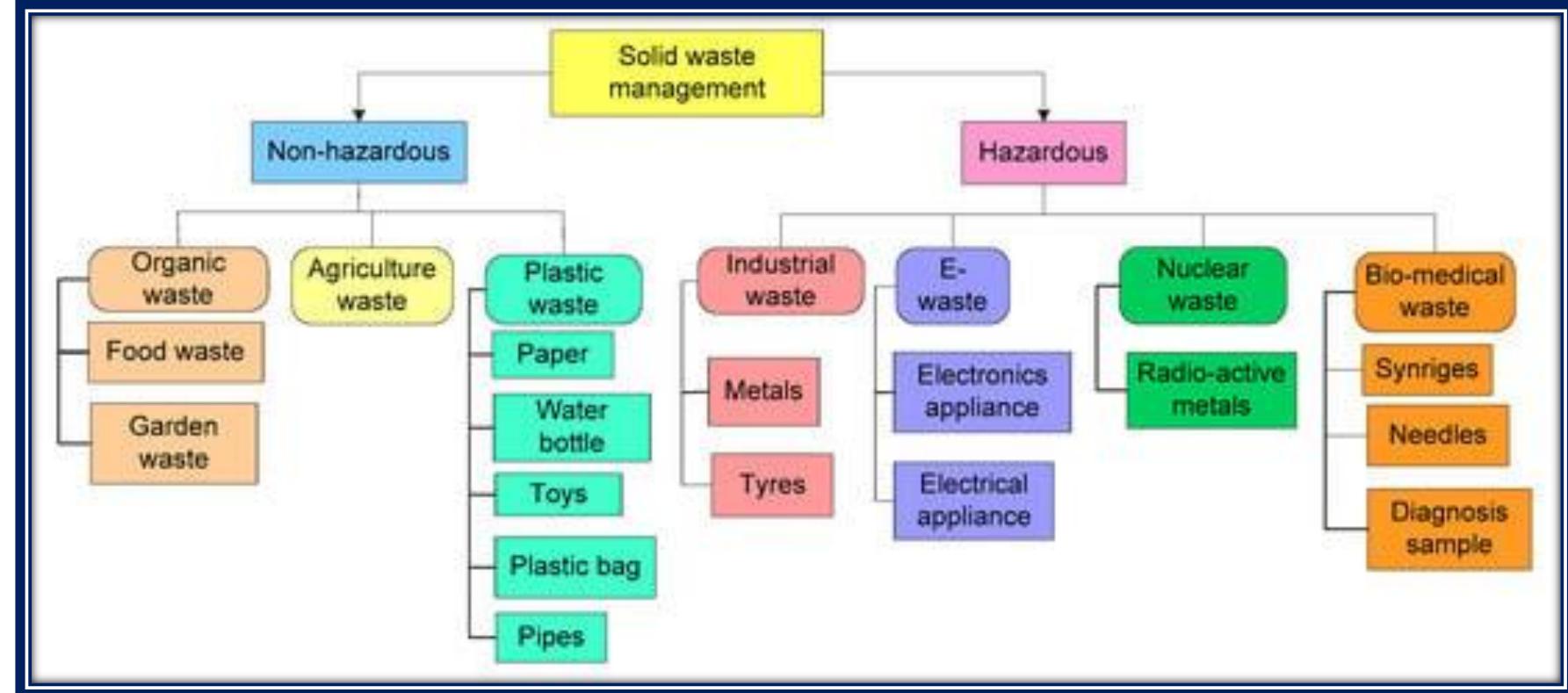
**Sustainable Waste Management Practices**

**Case Study**

**Role of Individuals and Communities**

**Conclusion**

# Types of Solid Waste????



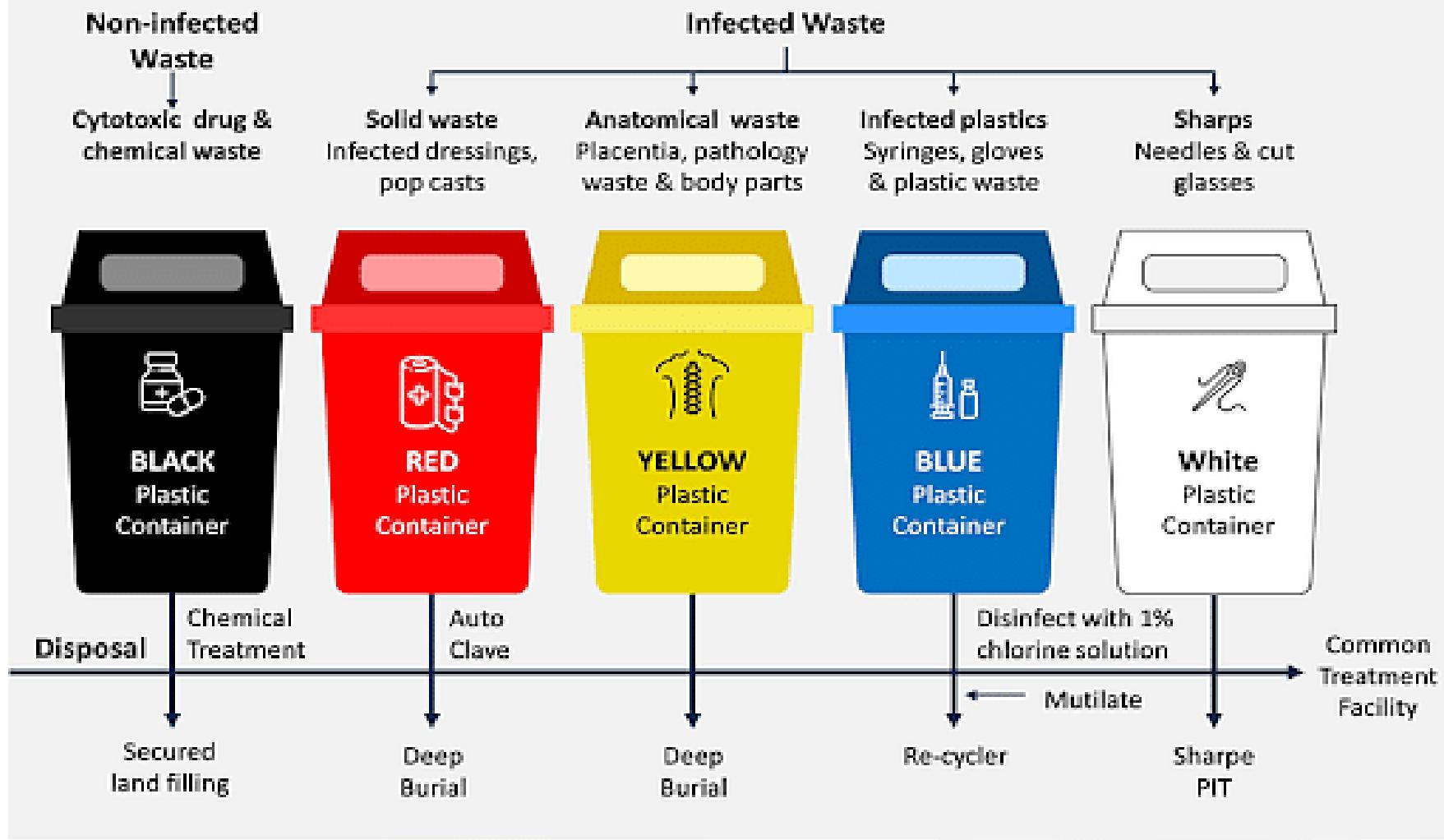
# Classification of Solid Waste

- **Biodegradable Waste** (Food scraps, paper)
- **Non-Biodegradable Waste** (Plastics, metals)
- **Hazardous Waste** (Chemicals, pharmaceuticals, nuclear waste)
- **Biomedical waste** (wastes generated from the hospitals)
- **E-Waste** (Discarded electronics)
- **Construction and Demolition Waste** (Cement, stones, Building debris)

# Biomedical waste

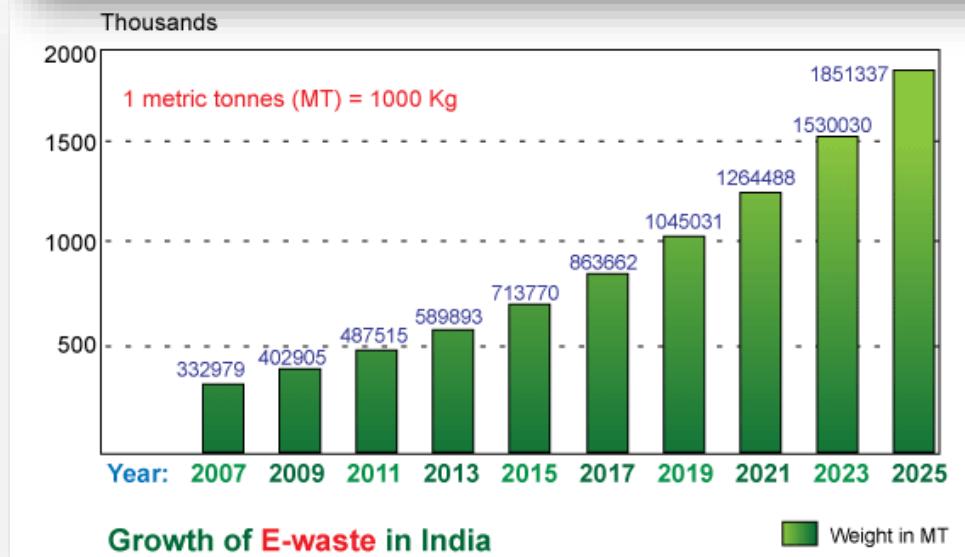
## WASTE SEGREGATION

### Segregation of Solid Bio-Medical Waste



# E -Waste

- A number of hazardous elements such as dioxins and furans are released in the process into the air which we breathe.
- This is a very morbid practice, which we should instantaneously stop.
- Some of the very liberal Resident Welfare Associations (RWAs) have distinct bins clearly marked for collecting e-wastes.



## Sources of solid waste

- **Residential Waste** (Household)
- **Commercial Waste** (Businesses, offices, Institutions)
- **Industrial Waste** (Factories, manufacturing plants)
- **Agricultural Waste** (Crop residues, animal waste)
- **Municipal Solid Waste** (General city waste)
- **E waste** (Batteries, Phones, TV's)
- **Biomedical Waste** (Hospitals)
- **Plastic waste**

# Challenges in Waste Management

- Increasing Waste Generation
- Inadequate Collection Systems
- Limited Infrastructure for Processing
- Environmental and Health Hazards
- Public Awareness and Engagement



What are the difficulties that India is facing in Waste Management

## **Waste Management techniques**

- **Source Reduction: Minimizing waste generation**
- **Composting: Biodegradable waste treatment**
- **Incineration: Burning non-recyclable waste**
- **Landfilling: Safe disposal in engineered landfills**
- **Recycling: Converting waste into reusable materials**

# ***PRODUCTS MADE FROM RECYCLED NEWSPAPER***



**Newspaper**

=



**Telephone  
Directory**



**Egg  
Cartons**



**Building  
Insulation**



**Construction  
Paper**



**Berry Boxes**



**Paperboard**



**Kitty Litter**



**Sheetrock**



**Paper Plates**



**Countertop**



**and New Newspaper**

## ***PRODUCTS MADE FROM RECYCLED OFFICE PAPER***



**Notebook Paper**



**Facial Tissue**



**Toilet Paper**   **New Computer Paper**



=



**Paper Towels**



**Napkins**



**New Notebook Paper**

**Computer Paper**

# ***PRODUCTS MADE FROM RECYCLED STEEL / TIN CANS***



# Non Recyclables

- **Rubber and Certain Types of Foam:** Tires, foam mattresses, rubber gloves
- **Packaging with Mixed Materials:** Juice boxes, chip bags (metal and plastic mix), foil-lined packaging
- **Electronics and Batteries :** Cell phones, laptops, AA batteries
- **Disposable Diapers and Sanitary Products : Used diapers, sanitary pads, tampons**
- **Textiles with Mixed Materials: Clothing made of synthetic fibers, shoes, bags with mixed materials.**
- **Ceramics and Non-Recyclable Glass:** Broken plates, cups, mirrors, light bulbs, Pyrex, and tempered glass
- **Certain Plastics (Low-Grade Plastics):** Plastic utensils, plastic straws, PVC (used in pipes and some food packaging), polystyrene (used in disposable cups and food containers)
- **Greasy or Soiled Paper:** Pizza boxes with grease, napkins, paper towels

# ***ROAD CONSTRUCTION USING WASTE BOTTLES***



# Impact of Poor Waste Management

- **Environmental Impact:** Soil, water and air pollution
- **Public Health Impact:** Diseases from improper waste handling
- **Economic Impact:** Increased healthcare and cleaning costs
- **Social Impact:** Quality of Life

# Environmental Impact

- **Soil pollution**
- **Water pollution**
- **Air pollution**
- **Loss of Biodiversity**



# Public Health Impact

- **Food Safety Concerns**
- **Respiratory Problems**
- **Disease Transmission**



# Economic Impact

- **Loss of Resources**
- **Loss of Revenue**
- **Increased Waste Management Costs**





1. **Reduce, Reuse, Recycle (3Rs)**
2. **Composting**
3. **Waste-to-Energy (WTE)**
4. **Sustainable Landfilling Practices**

# 1. Reduce, Reuse, Recycle (3Rs)

- **Reduce:** Minimizing waste generation at the source by using fewer resources, opting for sustainable products, and reducing single-use items.
- **Reuse:** Extending the life of products by reusing materials or repurposing items, such as reusing containers or donating goods.
- **Recycle:** Processing materials (like paper, glass, and metal) to create new products, reducing the need for raw materials and lowering emissions.



## 2. Composting

Organic waste, such as food scraps and garden waste, can be composted to produce nutrient-rich soil that supports agriculture and landscaping. Composting reduces the volume of waste sent to landfills, lowering methane emissions from organic decomposition in landfills.



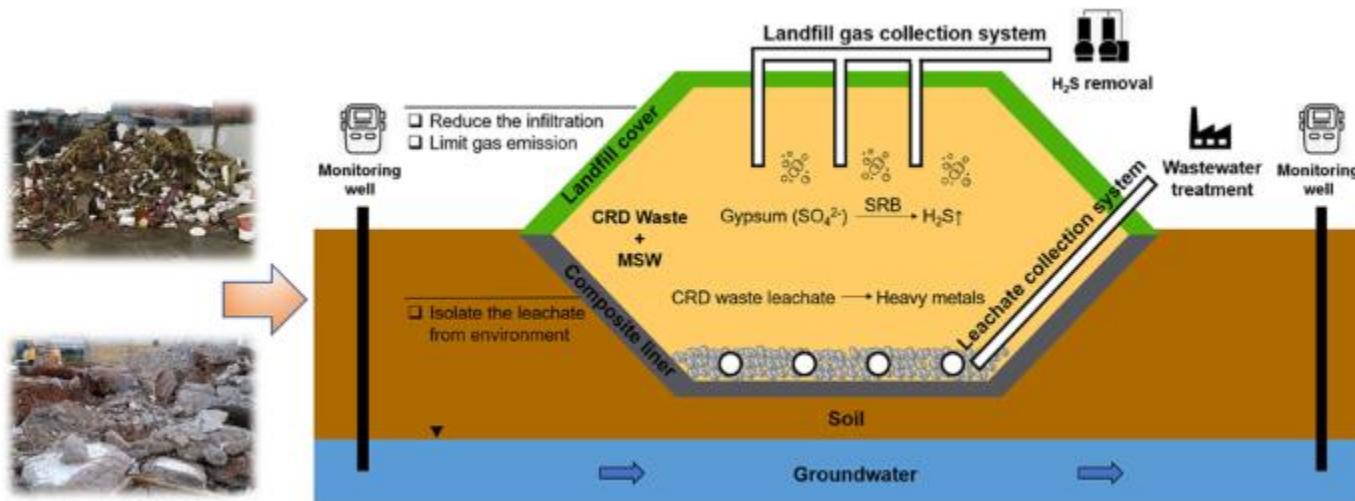
### 3. Waste-to-Energy (WTE)

Non-recyclable waste can be incinerated to produce energy, generating electricity or heat. Properly managed WTE plants can reduce landfill volume while harnessing energy from waste, although emissions must be controlled to minimize environmental impact.



# 4. Sustainable Landfilling Practices

- Where landfill use is necessary, sustainable practices include properly lined and managed landfills to prevent leachate and methane emissions. Modern landfills capture methane gas to use as energy and prevent groundwater contamination.





## **Role of Individuals and Communities**

- **Reduce, Reuse, Recycle:** How individuals can contribute
- **Segregation at Source:** Importance of sorting waste at home
- **Community Programs:** Public awareness

# Public Education

## Action Steps:

• **Medicine Collection Drives:** Launch campaigns to collect unused medicines, educating students about the importance of safe disposal.

• **E-Waste Collection:** Encourage the collection of electronic waste. If items weigh over 10 kg, we can arrange for pickup directly from our campus.

• **Collaboration for Impact:** Partner with other institutions to amplify our efforts and spread awareness.

**Address:** KIADB, Mulki Mangalore, Mangalore, Karnataka - 574154 [Medicare](#)

**Email:** reaelmngl@resustainability.com

**Phone:** 9900196884 Expired and unused medicines can be handed over to them. Sahas zero waste- **Free pick up at Hassan, Udupi/Mangalore, Bangalore urban and rural.**

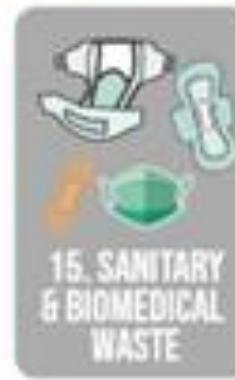
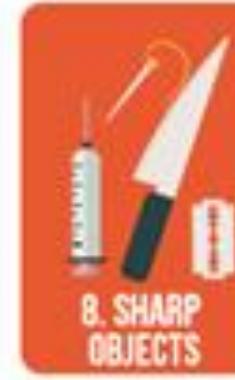
**MMR recycling Baikampady-** MMR Unit 2 Plot No.124A, Industrial Area, Baikampady, Mangalore – 575011 Karnataka, INDIA.  
Contact: +91 9901148952



## Case study

# Solid Waste management in Goa

## 16 WAYS TO SEGREGATE YOUR WASTE



# Indian Scenario

75-80% of the municipal waste gets collected and only 22-28 % of this waste is processed and treated.

Waste generation will most likely to increase from 62 million tonnes to about 165 million tonnes in 2030.



### Scenario:

- India accounts for roughly 18% the world's population and 12% of global municipal waste generation.
- India generates 62 million tonnes of waste each year. About 43 million tonnes (70%) are collected, of which about 12 million tonnes are treated, and 31 million tonnes are dumped in landfill sites.

# 3 Issues with India's Solid Waste Management

- With changing consumption patterns and rapid economic growth, it is estimated that urban municipal solid waste generation will increase to 165 million tonnes in 2030.

## Issues:

- Poor Implementation of Rules:**
  - Most metro cities are littered with garbage bins that are either old, damaged or insufficient in containing solid wastes, a 2020 research paper pointed out.

## Issues with India's Solid Waste Management

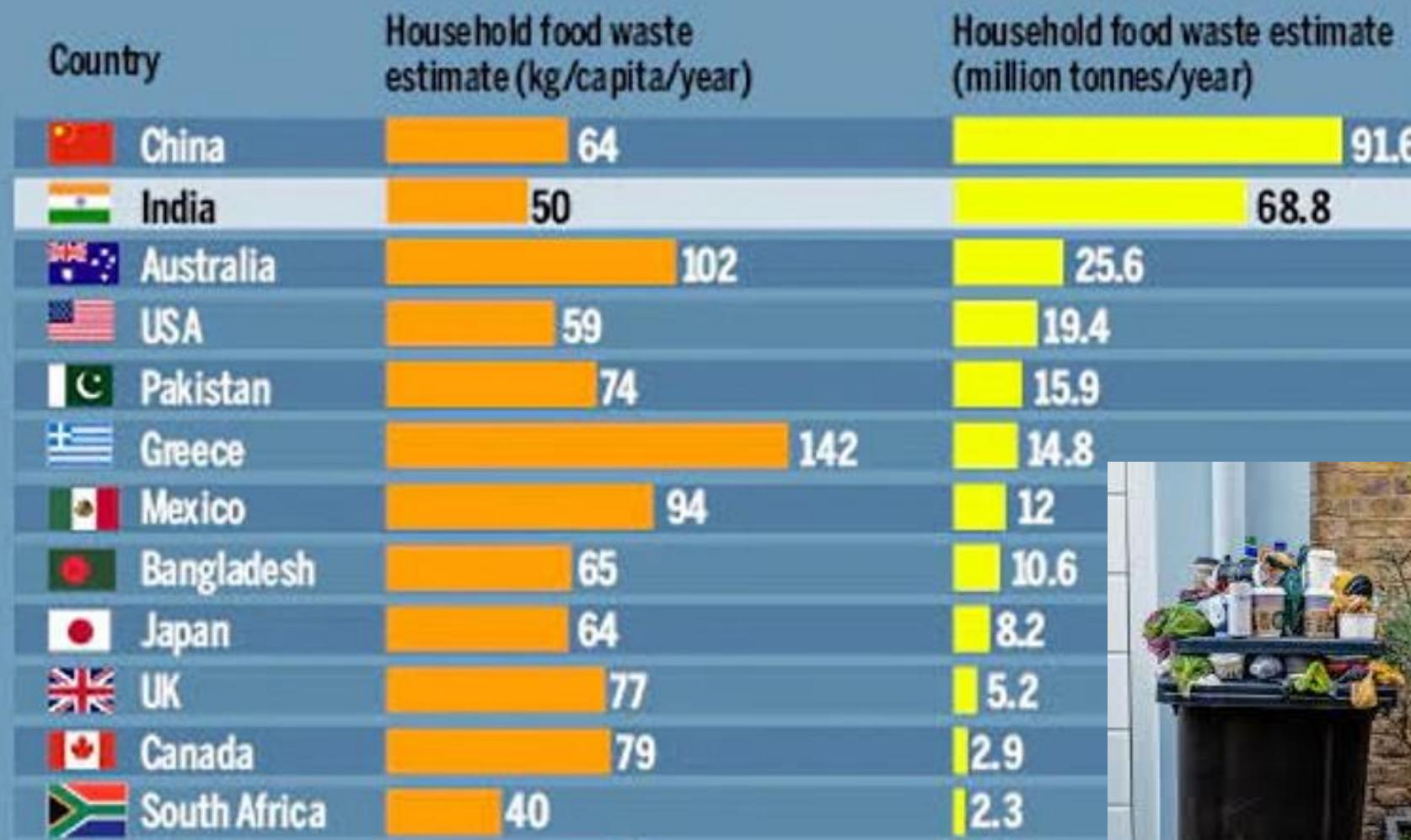
- Urban local bodies are struggling to implement and sustain rules under the Solid Waste Management Rules 2016, such as the door-to-door collection of segregated waste, studies show.
- There are designated waste collection sites under the Rules, but the implementation of rules and awareness remains low.

### Informal Workers:

- There is an urgent need to frame and implement a uniform waste-picker welfare law that recognises and integrates them into the waste management chain.
- It must include basic provisions related to mandatory identity cards, access to waste for collection, segregation, and sorting, PPE to minimise occupational hazards, right to basic necessities like water, sanitation and facilities for clean living, and health insurance.

# INDIAN HOUSEHOLDS SECOND-HIGHEST IN FOOD WASTAGE IN THE WORLD

Indian households accounted for 7.4% of the entire 931 million tonnes of food wasted in the world in 2019. Globally, a household on average wasted 74 kg food each year. In India, it was lower at 50 kg per household (68.8 mn tonnes a year). In comparison, the US wasted 59 kg per household (19.4 mn tonnes) and China 64 kg per household (91.6 mn tonnes).



# CHALLENGES

1. Inadequate Segregation at Source
2. Insufficient Infrastructure and Technology
3. Limited Funds and Poor Planning
4. Low Public Awareness and Participation
5. Informal Sector Challenges

# CHALLENGES

## **1. Inadequate Segregation at Source**

Most households and businesses do not separate waste into wet, dry, and hazardous categories. This makes collection, recycling, and composting difficult, leading to mixed waste being dumped in landfills.

# CHALLENGES

## **2. Insufficient Infrastructure and Technology**

Many cities lack modern waste-processing plants, efficient collection systems, and scientific landfill sites. Existing landfills are overfilled and operate like open dumps.

# CHALLENGES

## **3. Limited Funds and Poor Planning**

Urban Local Bodies (ULBs) often face financial constraints and lack long-term planning. Waste management projects sometimes remain incomplete due to budget limitations.

# CHALLENGES

## **4. Low Public Awareness and Participation**

Citizens often litter, burn waste, or dump garbage openly due to lack of awareness, poor civic sense, or absence of strict enforcement of waste rules.

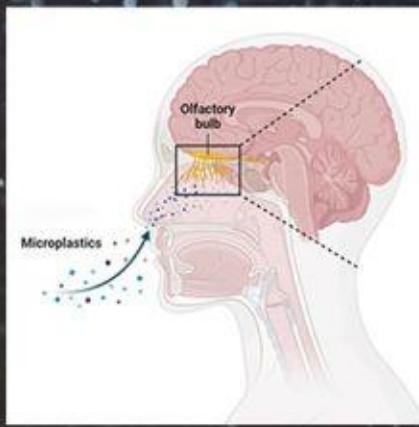
# CHALLENGES

## **5. Informal Sector Challenges**

Waste pickers play a major role in recycling, but they work without safety gear, regular wages, or government support. Integration of this informal sector into formal systems remains a challenge.



New research:  
**Microplastic pollution  
entering the brain**

A photograph of a young child with blonde hair, wearing a yellow shirt, covering their nose and mouth with their hands. The background is dark with small, glowing blue particles scattered around.

**PLASTIC  
SOUP**  
FOUNDATION

# CONCLUSION

**"Waste isn't waste until we waste it."**

**"Think before you throw; every piece counts!"**

**"Be a part of the solution, not the pollution!"**

**"Embrace the 3 R's: Reduce, Reuse, Recycle—because the Earth deserves better future."**



# THANK YOU

St Aloysius University