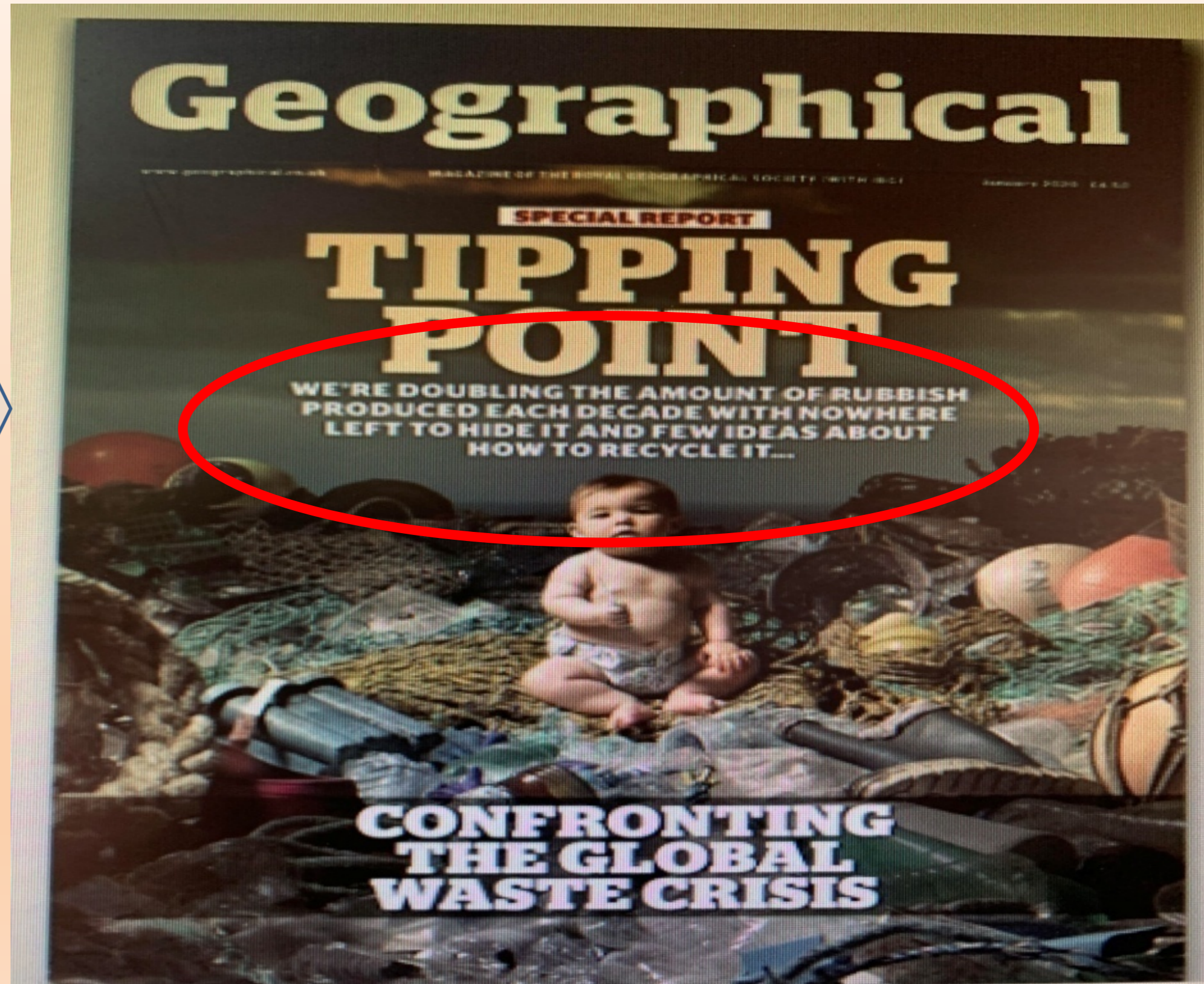


# Some Hard Truths

Confronting Global  
Waste,  
A topic of concern  
Will stay with us for the  
decade,  
**IT IS TIME TO ACT**



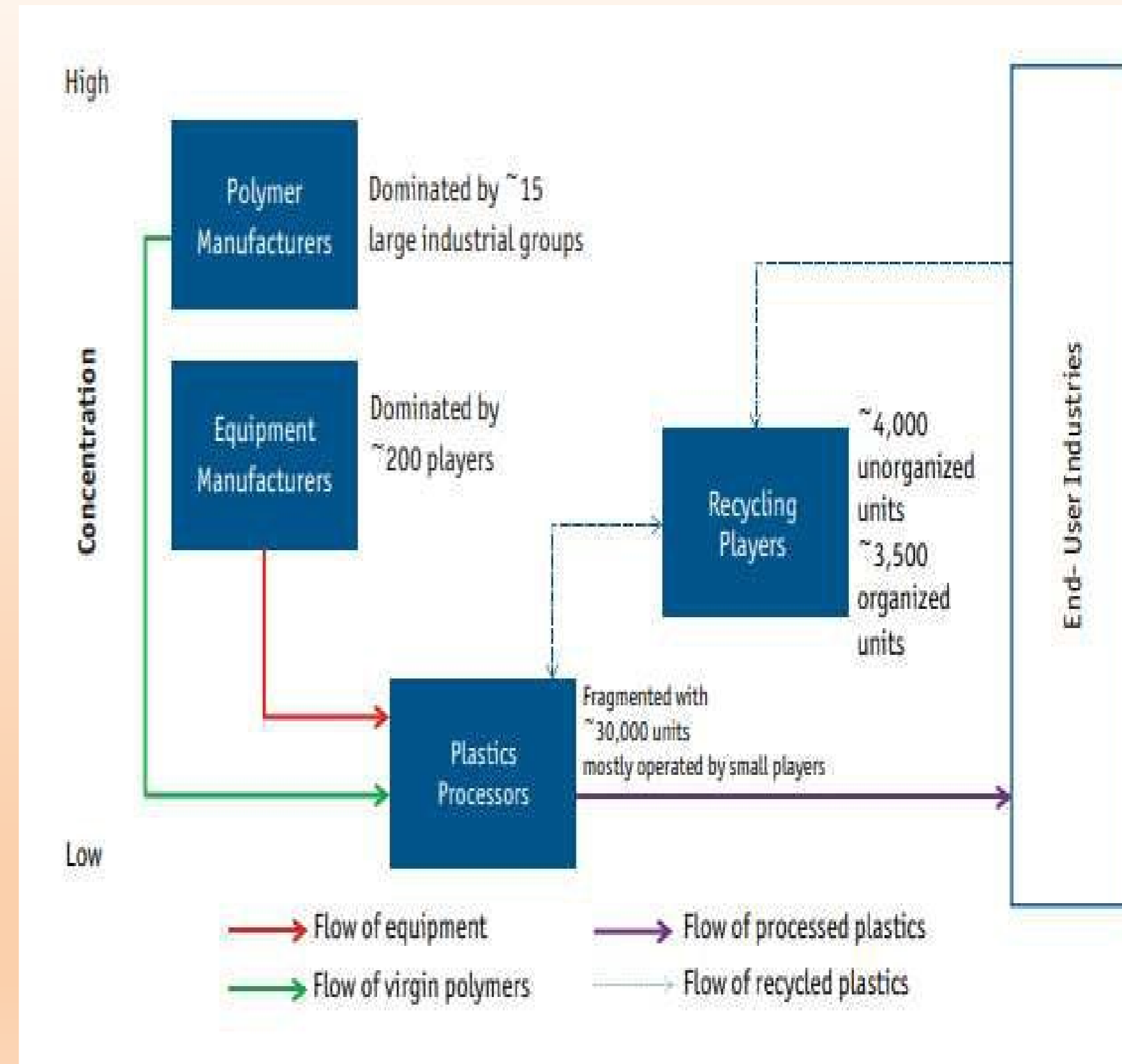
# STRUCTURE OF INDIAN PLASTIC INDUSTRY

The entire chain in the Plastic industry classified as:

(A) Upstream sector: Manufacturing of polymers and

(B) Downstream sector: Conversion of polymers into plastic articles

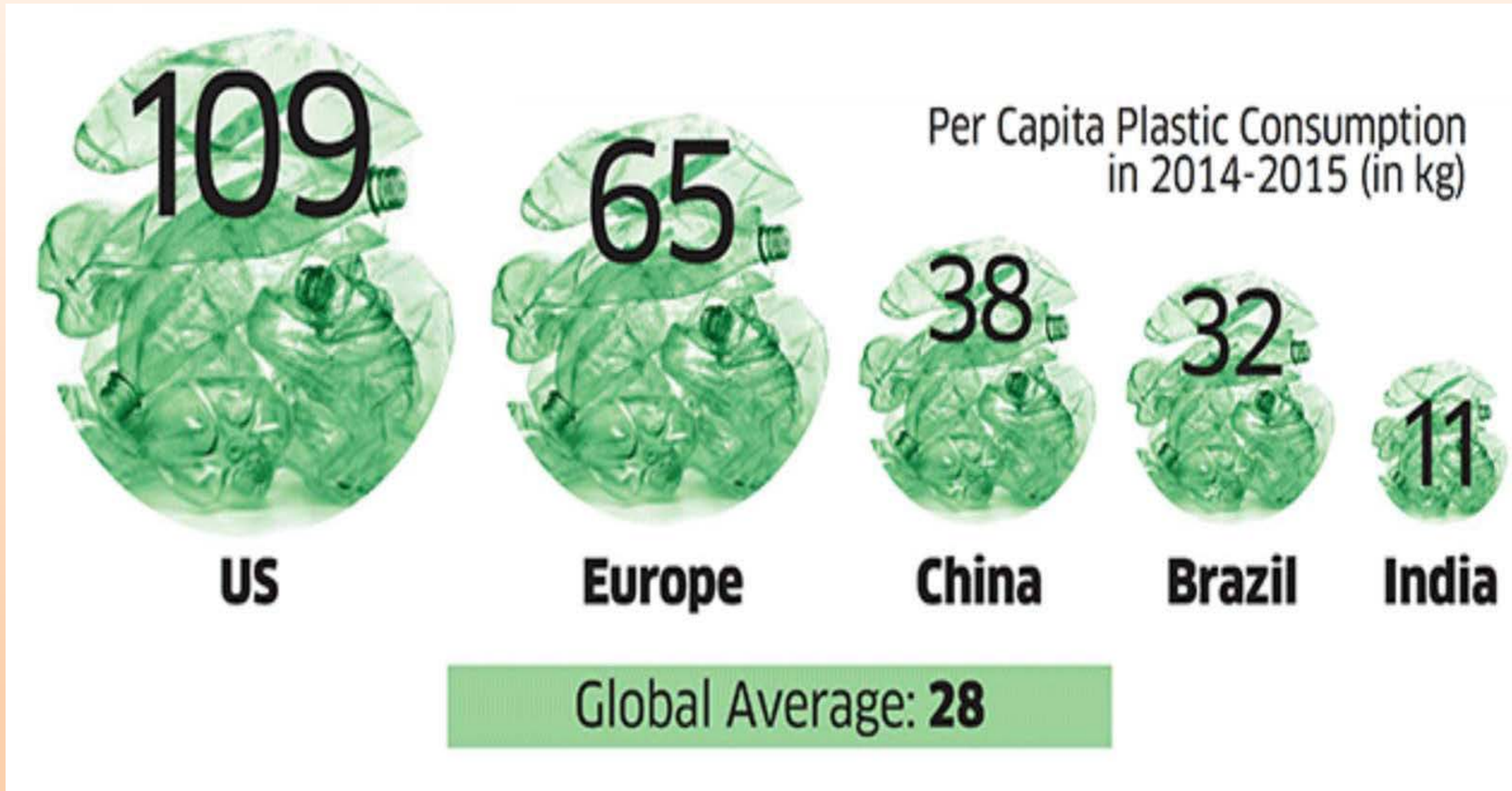
- The upstream polymer manufacturers - commissioned globally competitive size plants with imported state-of-art technology from the world leaders.
- The downstream processing industry fragmented - consists small and medium units



Source: CRISIL, Plastindia Foundation, Kanvic, TSMG Analysis

# RISE OF PLASTIC CONSUMPTION IN INDIA (Per Year)

INDIA'S PLASTIC  
CONSUMPTION  
IS A TENTH OF  
US'S

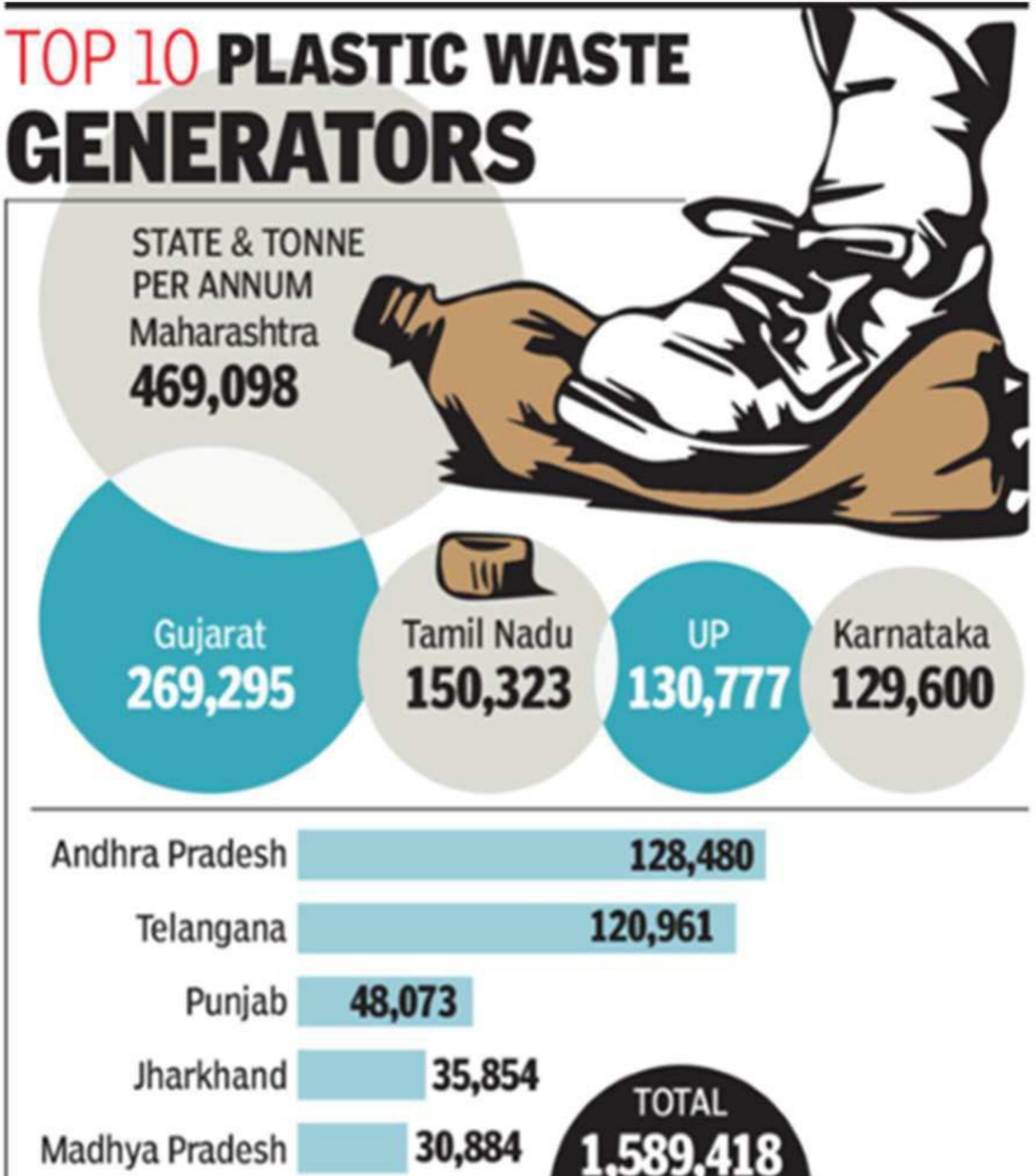


Source: AIPMA and PlastIndia, TATA Strategic analysis Source: Central Pollution Control Board

# PLASTIC WASTE GENERATION IN INDIA

Central Pollution Control Board has estimated for the 2017-18

Plastic Waste in India : **26,000 TPD : 9.4 MTA** Plastic Waste Recycled : **15,600 TPD : 5.6 MTA** Uncollected and littered : **9,400 TPD: 3.8 MTA**



Estimated Quantity of Plastic Waste Generated	15,300 MT Per Day (9% of Total MSW)
Per Capita Plastic Waste Generation	6 kg per capita per year
Plastic Collection and Recycling Rate	60% (India Leads in the world)
Recyclable Plastic composition in waste	80% (LDPE, PET, PVC, HDPE, PP, PS)
Non-Recyclable Plastic Composition in waste	20% (Alkyds, Epoxy, Non Recyclable Ester, Melamine formaldehyde, Polyurethane, Urea formaldehyde, Phenol formaldehyde, Silicons)
Cause of threat	<ul style="list-style-type: none"> <li>➤ Non-biodegradable in nature</li> <li>➤ Non segregation</li> <li>➤ Littering, burning and dumping at Landfill</li> </ul>

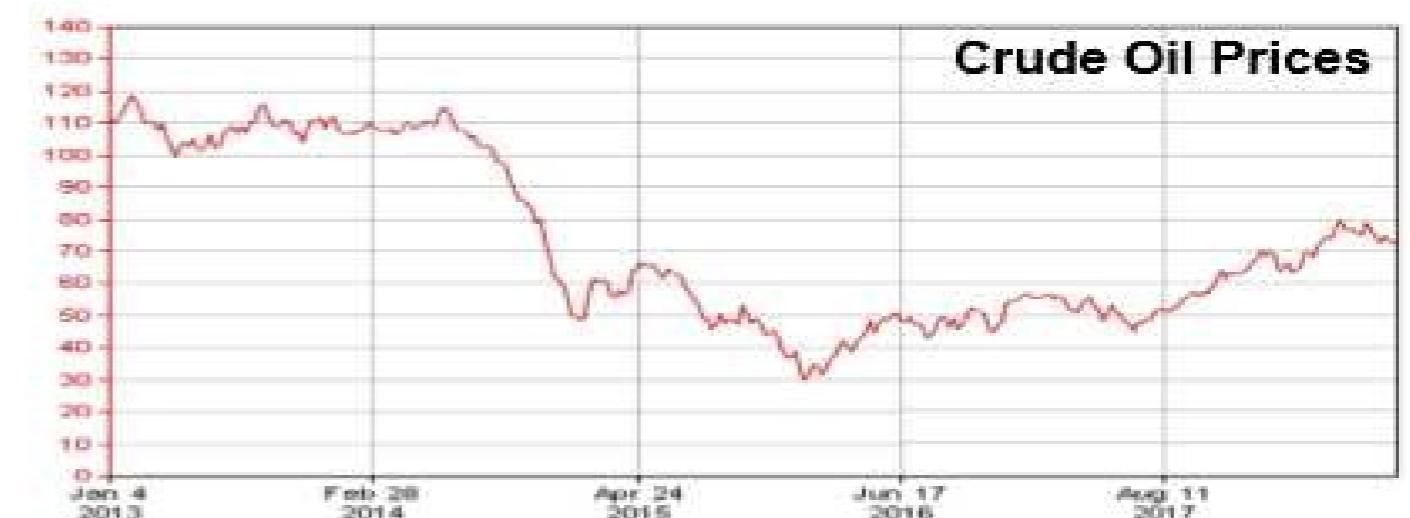
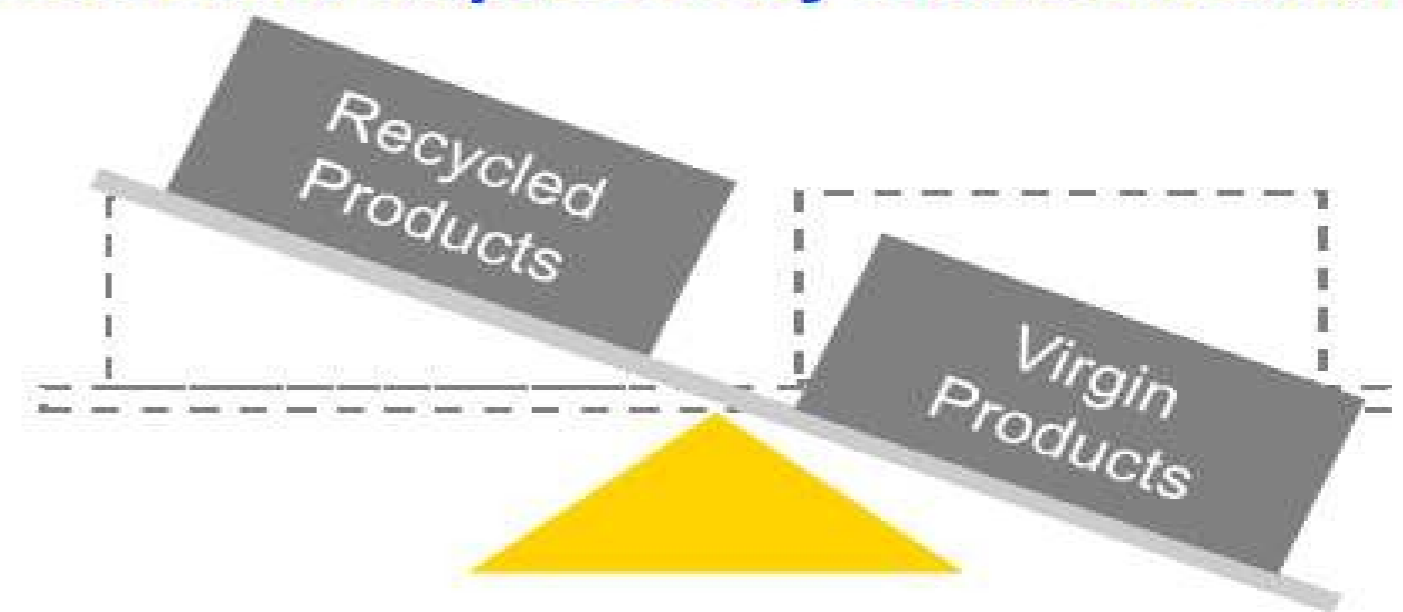
# PROBLEMS RELATING TO PLASTIC WASTE IN INDIA:

## KEY CHALLENGES

Challenges across the value chain.....

- Smaller Skilled units – low value with no incentive to collect
- Lack of awareness –littering, non segregation at source
- High cost of collection and transportation
- Manual processes lacks automation
- Absence of a comprehensive and consistent policy
- Challenges in implementation

....further impacted by market volatilities



# CURRENT PLASTIC PACKAGING RECYCLING RATE

## Recycling rates

Countries	Recycling Rates
USA	Overall ~ 25% <ul style="list-style-type: none"><li>- 9.5% recycled</li><li>- 15% energy recovery</li><li>- 75% landfill</li></ul>
EU 28 + 2	Overall recovery ratio ~ 69 %
China	22%
India	<b>60% (CPCB)</b>

Only 14% of plastics packaging is recycled globally

*.....Better Recycling rates in India*

AROUND 60% OF INDIA'S  
PLASTIC WASTE IS RECYCLED

**Total Plastic Waste  
Generated Every Day**

15,342  
tonnes



*India fares far better in plastic recycling –  
**THANKS TO THE WASTE PICKER BASED  
RECYCLING ECONOMY.....***

# MAJOR SOURCES OF PLASTICS WASTE IN INDIA

Packaging

E-Waste

Biomedical

Auto-Waste

## Top 5 Plastic Waste Producing States Of India



Figures in tonnes per annum

Source: Central Pollution Control Board Annual Report 2015-16

NDTV.com

# Regulatory Developments



**2014**

Clean India Mission  
Launch



**2016**

Plastic  
waste  
managem  
ent rules

NGT bans plastic items in towns  
located along banks of Ganga



**2017**

Increased  
focus on  
implementati  
on

**BEAT  
PLASTIC  
POLLUTION**

**WORLD  
ENVIRONMENT  
DAY**



**2018**

Multiple state  
legislation PM-  
Champion of Earth

**POLLUTED BY  
A SINGLE-USE PLASTIC**



**2022**

Commitment to  
ban single use  
of plastic

# RISING PLASTIC WASTE: NEED OF RECYCLING

PLASTIC WASTE POSES A HUGE THREAT TO MARINE ECOLOGY

SUSTAINABLE  
DEVELOPMENT

There are  
**8 million**  
tonnes of  
plastic waste  
entering the  
ocean every  
year

The total plastic  
in the ocean  
amounts to  
**150  
million  
tonnes**

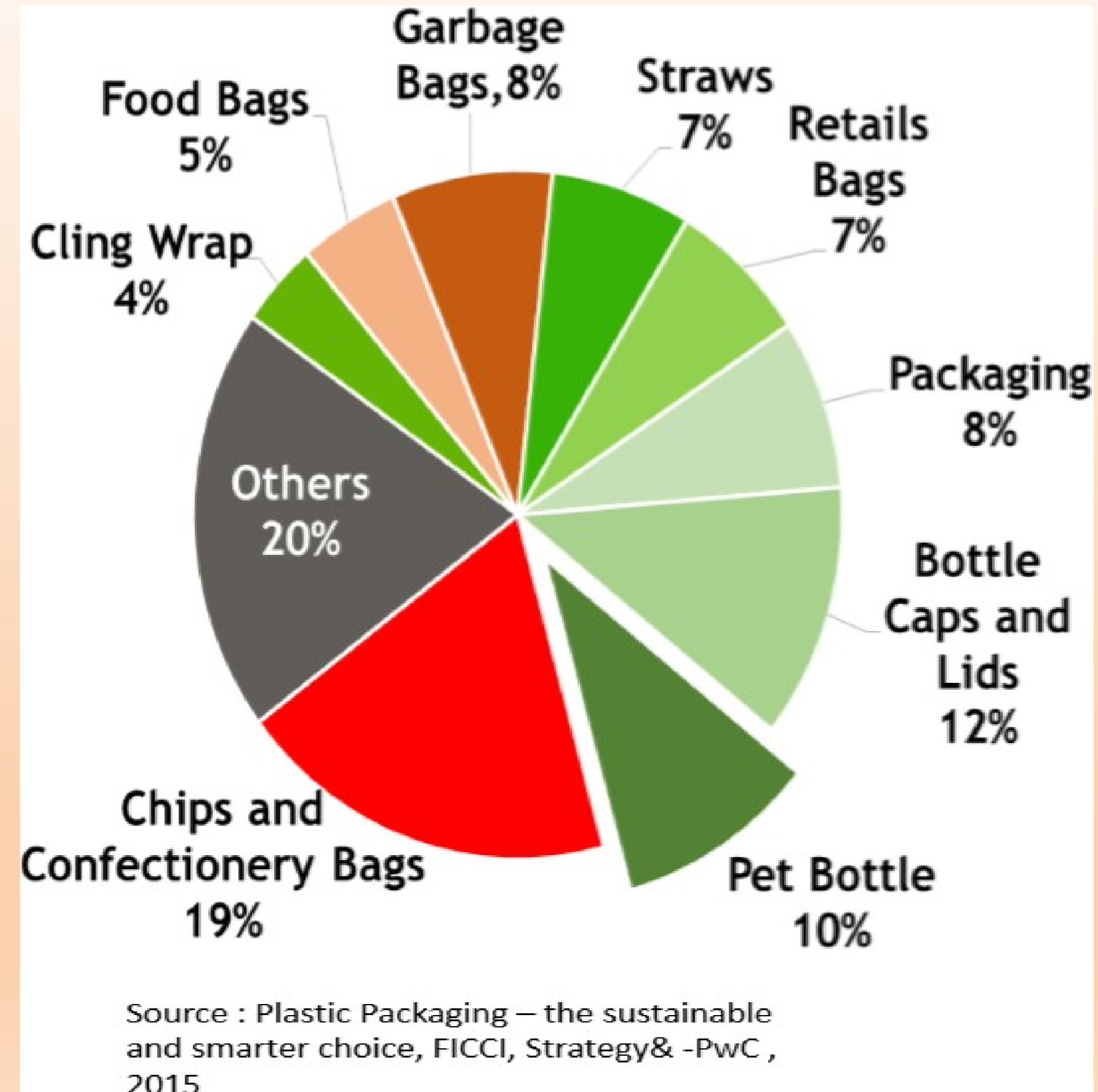
Plastic packaging  
accounts for  
**62%** of all  
items recovered  
in coastal clean-  
up efforts

In 2014, there was  
**1 kg of plastic in the  
ocean for every  
5 kg of fish, and by  
2050 there will  
be more plastic  
than fish**



# PACKAGING WASTE CONSTITUTES THE MAJOR PART OF PLASTIC WASTE IN INDIA

- Plastics Recycling rate - 60%
- PET recycling rate - 90%
- PET Composition - 10%
- Non PET recycling rate - 55-60%
- **Solutions required for :**
  - Chips and Confectionery bags-
  - Multilayer Garbage Bag
  - Food Bag
  - One time use sachets
  - Sanitary Waste/Diapers



# ENVIRONMENTAL ASPECT OF RECYCLING IN INDIA

## **Landfill sites are reduced**

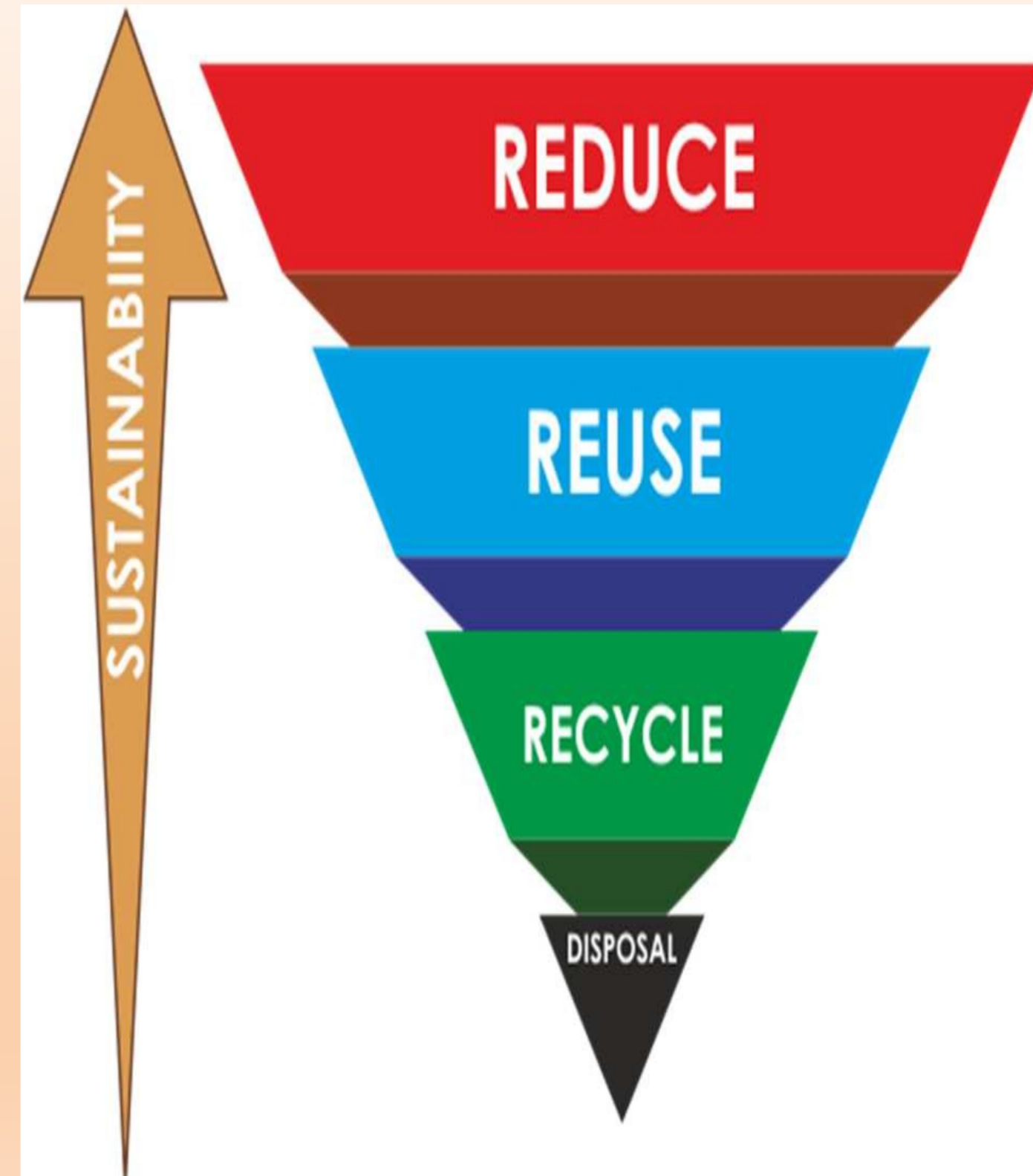
- Waste is disposed of in the landfills which causes a number of environmental problems
- Choosing to recycle materials like paper, cardboard, metal, plastic, etc., means you are keeping them away from landfills

## **Energy Consumption is Minimized**

- Making recycled plastic products requires less energy and resources as compared to making new plastic products for example.

## **Pollution is Reduced**

- When you recycle the waste instead of sending it to the landfills, you are directly reducing the pollution that occurs as a result of landfill. Further, recycling various products leads to less carbon emissions, reducing the carbon footprint that product.



The term 'recycling' is inadequate as it does not fully convey the underlying circularity of the system. More appropriate terms are 'recyclable resource recovery', 'resource recovery' or 'reprocessing'. These terms are the circular actions needed in a circular system on an industrial scale; we are recovering resources as inputs for reprocessing into outputs to benefit society.

# What Is Recycling And What Can We Recycle?

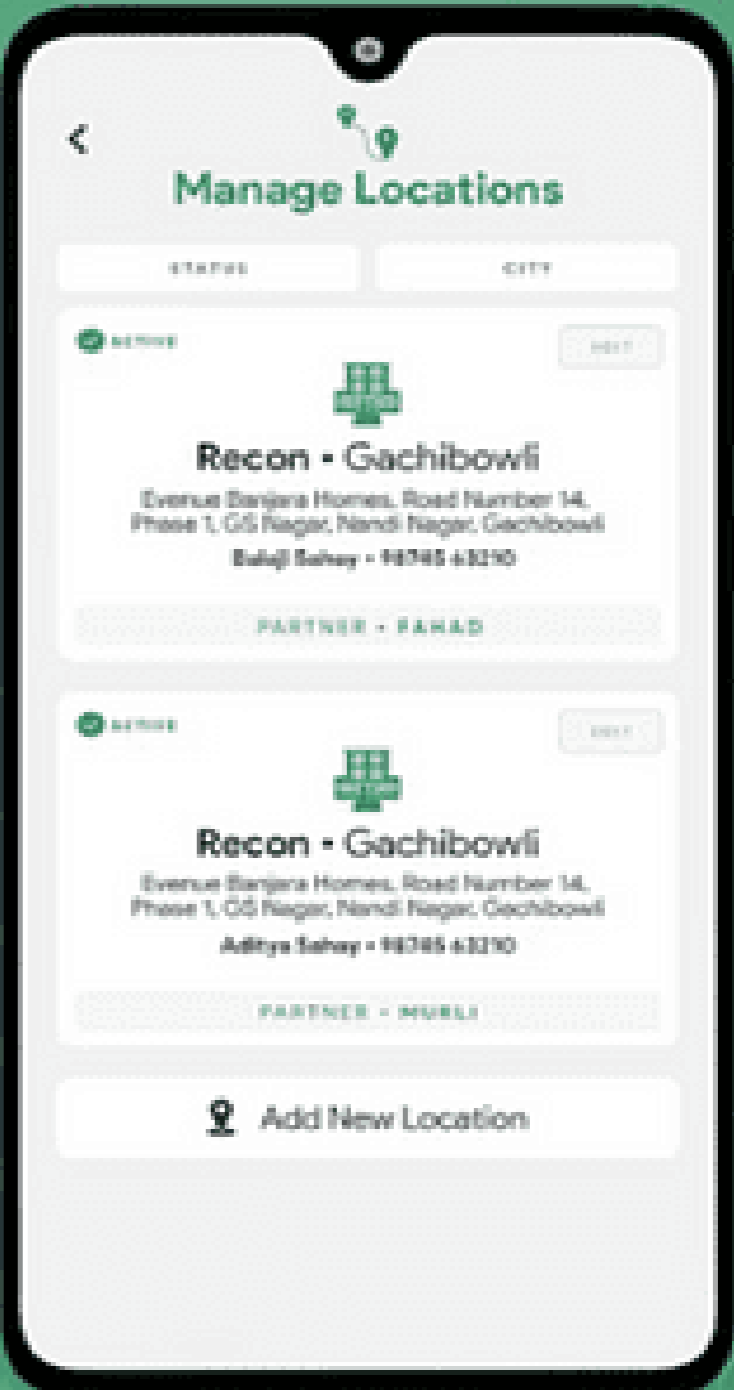
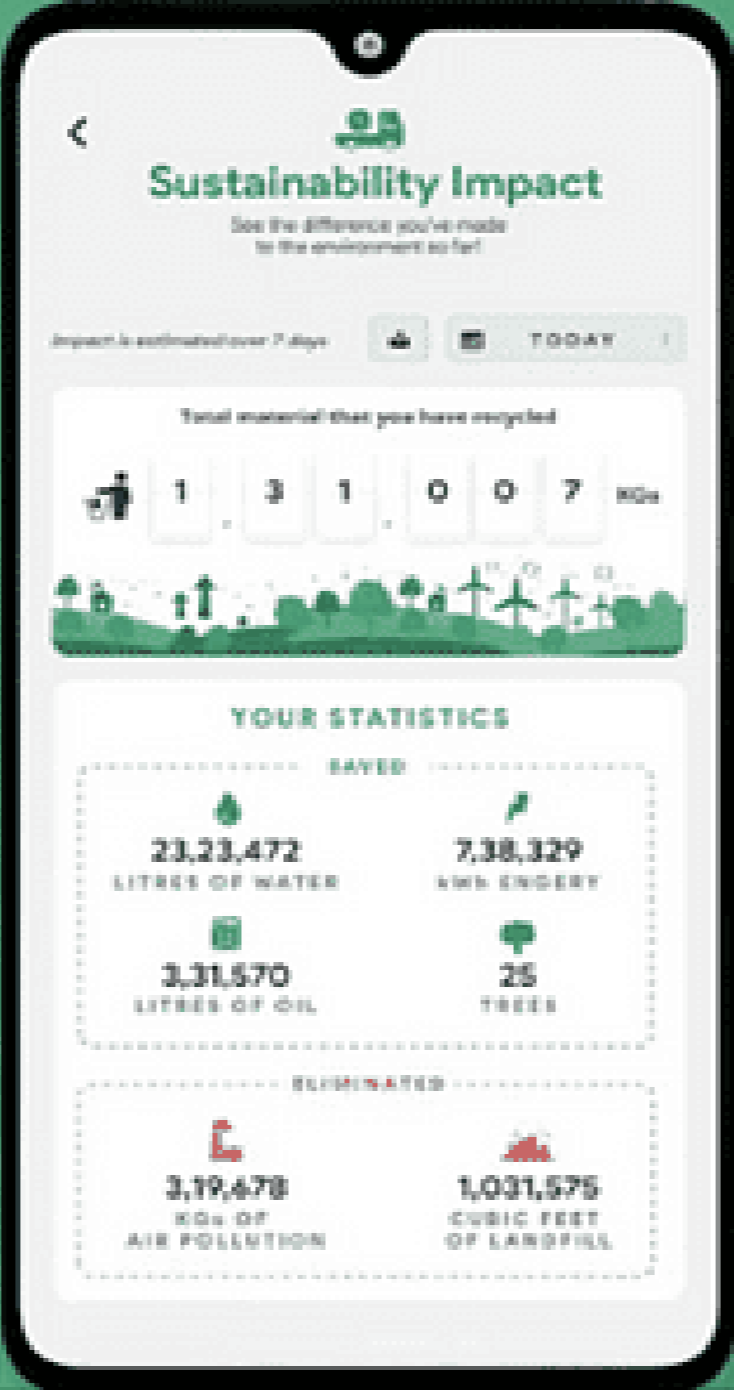
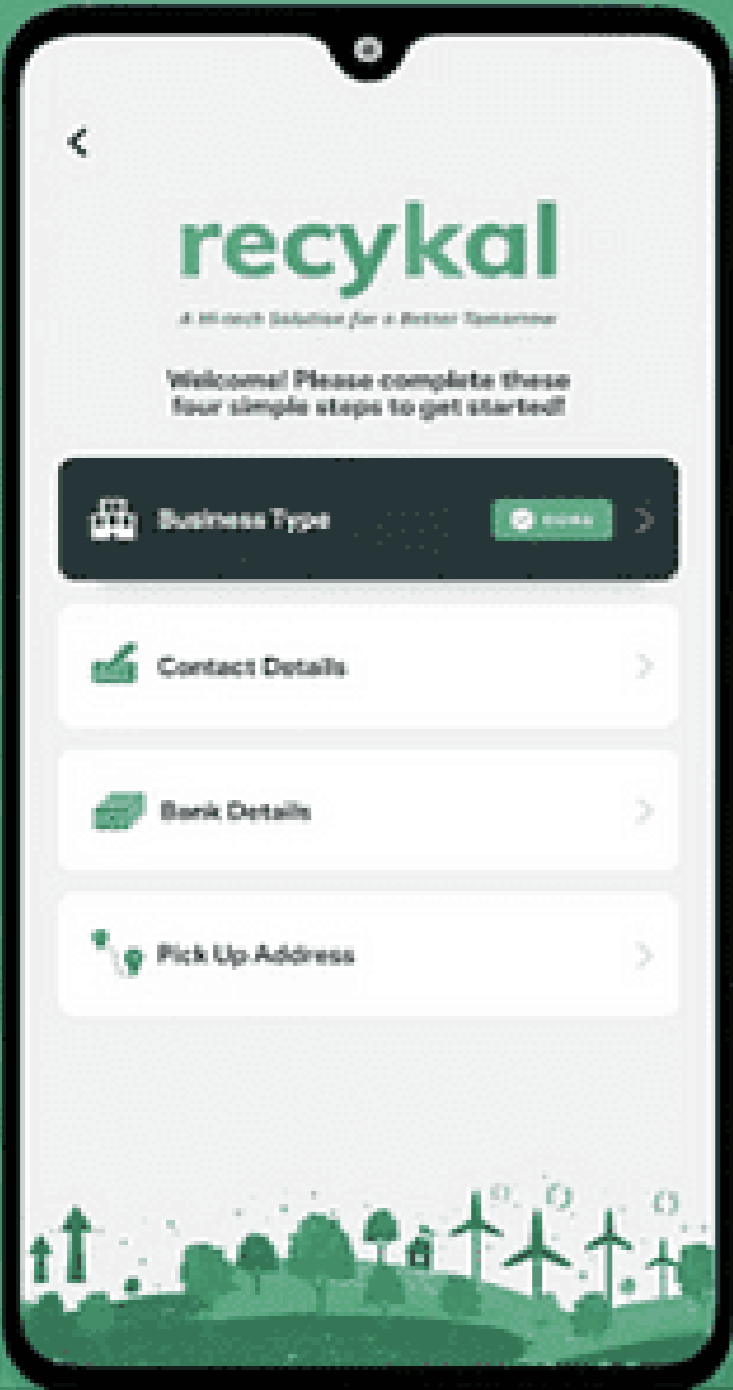


**MADE FROM MLP.....  
COURTESY SHAKTI  
INDUSTRIES**



**Paver block and dam**





The street picker-based recycling economy, along with the various bans, have ensured India's continued efforts in battling plastic pollution. At the other end of the spectrum, the country is home to some of the most innovative thinking about plastics recycling. The informal sector which once dominated recycling is slowly getting formalized. Also Government of India and states initiating plastic recycling hubs That approach might be found here. [Banyan Nation](#), a plastics recycling start-up from the Indian city of Hyderabad, stunned the world [by winning](#) the Dell People's Choice Award for Circular Economy Entrepreneur as part of the Circulars Awards at the World Economic Forum in Davos.

## Akshar Forum School in Assam accepts plastic waste as school fees



## A garbage bin that rewards users with free WiFi!

*Two commerce graduates decided to give free WiFi to people in exchange of a cleaner surrounding with an unique initiative -- a 'WiFi Trash Bin'.*

PTI | Updated: Aug 17, 2015, 07:18 PM IST

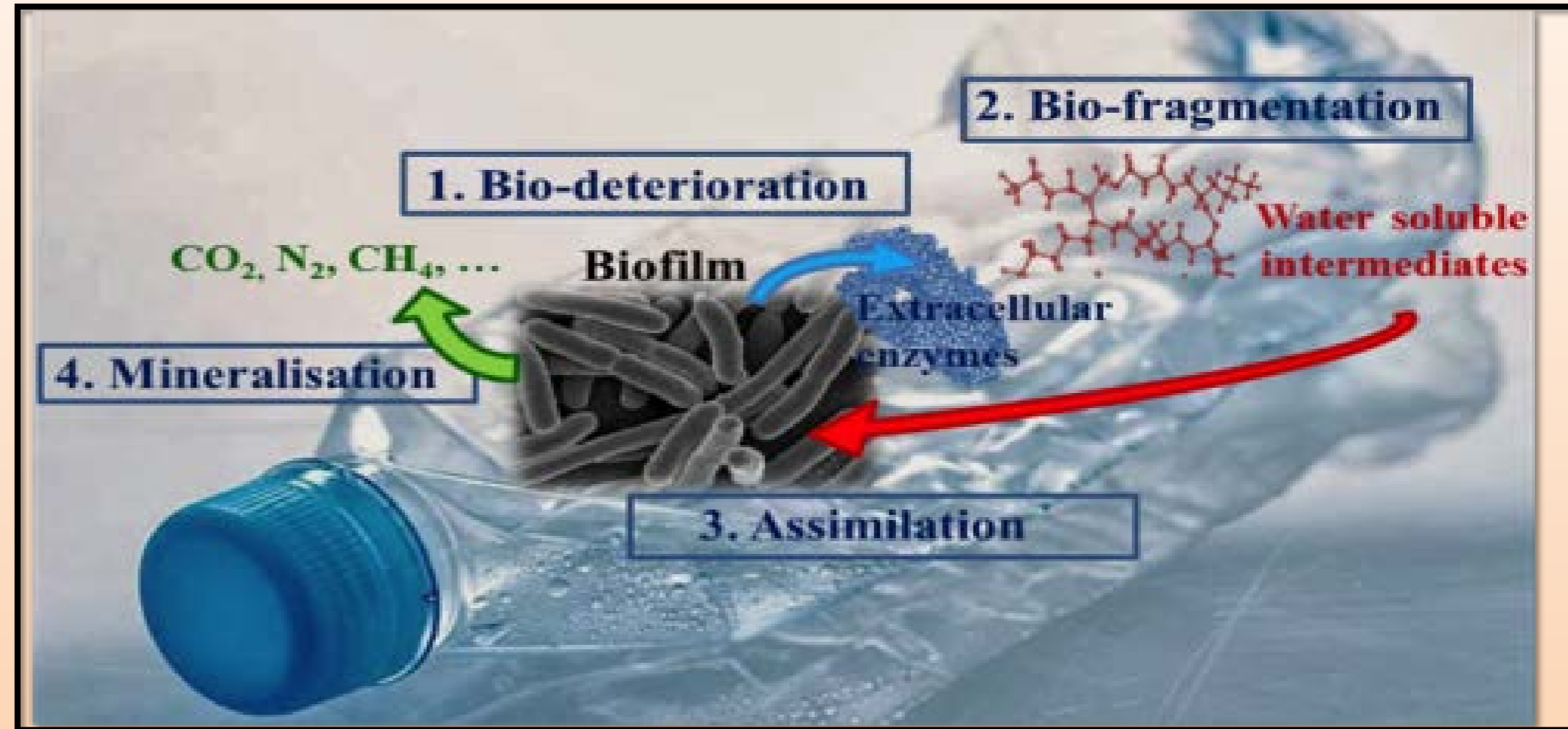


Save

A+



# Plastic - A Resource



1. Non Toxic plasticizers
2. Inbuilt decomposers in polymer layer
3. Microbes for micro plastic decomposition
4. Multi packets instead of Multi Layers
5. Bio decomposable synthetic polymers both is marine and land regions
6. Toothbrush

# PLASTICS RECYCLING / RECOVERY (2018-19)

- ❖ **Number of Organised Recycling Units : 100+ (42 in PET Recycling)**
- ❖ **Number of Unorganised Recycling Units : 10000+**
- ❖ **Manpower – Direct 100,000+**
- ❖ **Manpower – Indirect (includes Waste Pickers) : 1-1.5 Million**
- ❖ **Est. Quantum of Plastics Recycled : ~6 MMT**

## EST. % OF PLASTICS RECYCLED 2018-19

Summary	Qty in MMT
Commodity Plastics Consumption in 2018-19	15.71
Quantity entering Waste Stream from 2018-19 Consumption ( ~42%) within one year*	6.60
Quantity entering Waste Stream from previous 5 years to 2018-19	2.00
Total Quantity of Waste Plastics (2018-19)	8.60
Quantity recycled in 2018-19 (~70%)	6.02
<i>*remaining 9 million tons are in long term usage</i>	

*~6 million Tons Recycled in 2018-19 which is ~70% on Waste Stream*



The recycled [#OceanBoundPlastic](#) products Lucro makes are high-quality, cost-competitive and good for the world. We strive to achieve perfection ev ...see more



lucro-products-made-from-ocean-bound-plastic-waste

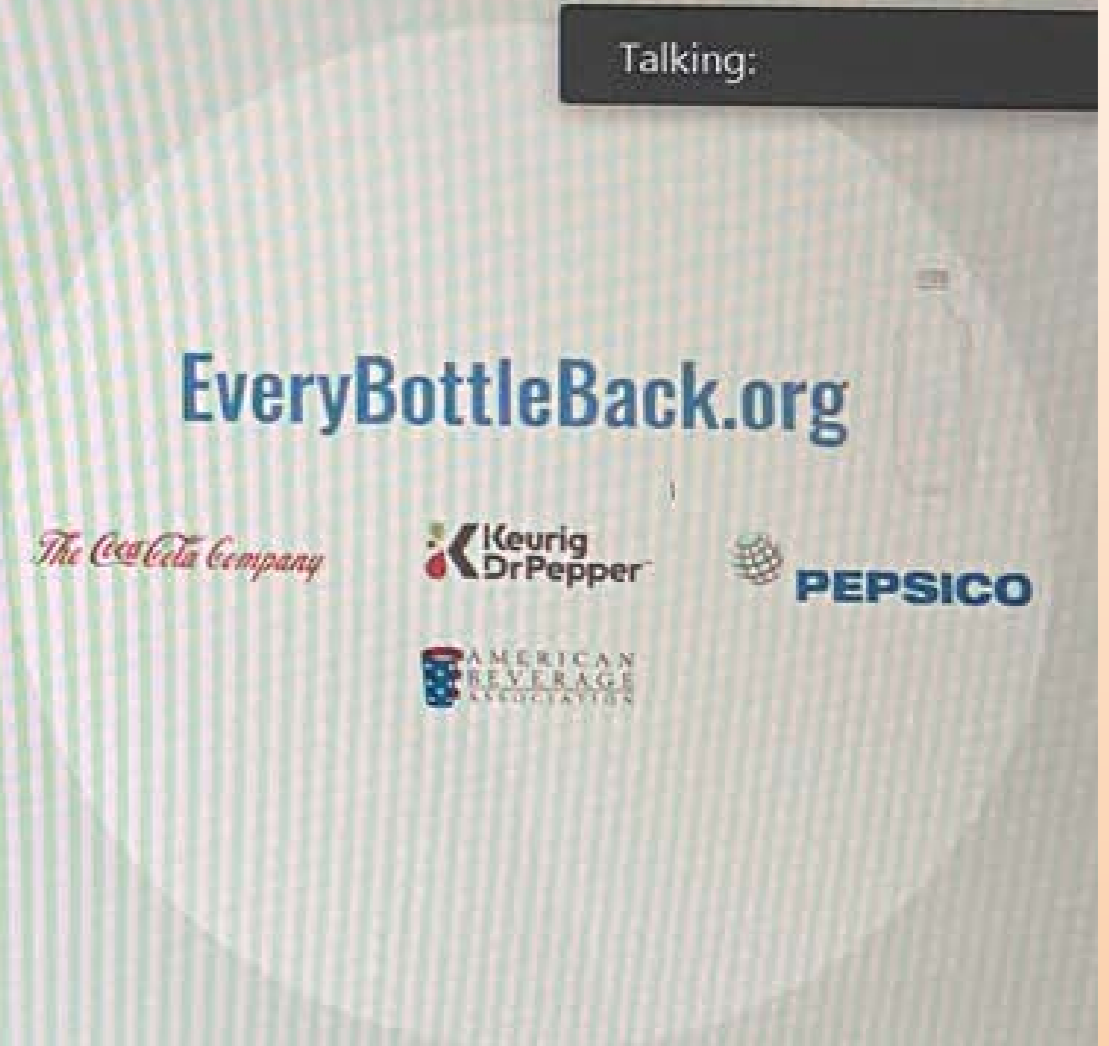
# The tides are shifting. There is a desire for change



**Consumer** demand for responsible plastic use options



**Legislative** push for new plastic waste



**Market** pull from large brand owners and FMCG companies

Talking:

# Design for Recycling

The objective of the Design for Recycling Guidelines for Plastic bottles is to encourage packaging designers, converters and customers to integrate certain criteria during the development phase of a new product in order to facilitate Recycling at high rates.



# EXTENDED PRODUCER RESPONSIBILITY (EPR)- REGULATION IN INDIA

- Lead Acid Batteries since 2000
- E Waste Management Rules, 2011, 2016
- Plastic Waste Management Rules, 2016

## Issues:

- Lack of understanding around EPR- what would work for India with a large rural base
- No consistent long term strategy around CE and EPR
- Lack of infrastructure for collection and recycling, largely informal, can't be tracked
- Not much clarity on the roles and responsibilities of different stake holders
- Inadequate monitoring, provision for penal action



# ECONOMIC ASPECT OF RECYCLING IN INDIA



## Financial Benefits

- Make money selling recyclables
- Community Financial Benefits



## Resource Conservation

- Proper utilization of plastics leads to lesser production demand



## Job Creation

- Sector is ripe with work opportunities for middle-class people and those with limited education
- Green jobs are essential for our economy and have an equally significant hand in making our planet a better place to live on



## Saves Energy

- Use of recycled materials reduce the energy consumption



## Builds Community

- People work together, Communicate, Share ideas, Support each other

# RECYCLING PROCESS AND TECHNIQUES

## ADOPTED IN INDIA

COLLECTION

SORTING

SHREDDING

CLEANING

MELTING

REUSING





**How unpopular  
plastic turned saviour  
in Covid-19 fight**



# 72 nations to adopt Indore's waste-to-energy model

Resolution Passed By The United Nations

Times News Network

Indore: In Swachh Bharat Mission, Indore leads rest of the world follows. Following the footsteps of Swachh city, 72 Asian and African countries are now replicating the bio-methanation model for treatment of wet waste into bio-CNG.

A resolution in this regard was passed in a conference of International Forum for Sustainable Asia and Pacific held recently in Tokyo. The conference was hosted jointly by United Nations (Asia Pacific Region) and government of Japan on Sustainable Technologies.

Indore Municipal Corporation (IMC)'s waste management consultant Asad Warsi was invited as a technical expert to give a presentation about technical features of bio-methanation plant that was set up in Indore for producing bio-CNG out of wet waste generated in city daily.

THE INDORE PROTOTYPE		CITY SET-UP
<b>ADVANTAGES</b>		Two Units Already Operational Choithram Mandi 8 tonne/day Kabitkhedli 15 tonne/day
<ul style="list-style-type: none"> <li>Most sustainable zero waste model for wet waste management</li> <li>It fulfils the need of cost effective technologies of partner countries</li> </ul>	<ul style="list-style-type: none"> <li>UN, with help of Japan govt, will install one plant of 50 tonne capacity in each country</li> </ul>	One Proposed At Trenching Ground 50 tonne/day
<b>PLAN OF ACTION</b>		<ul style="list-style-type: none"> <li>After that, it will be up to respective nations to carry on with initiative or develop it further</li> </ul>

Warsi said that at least one biogas plant with 50 tonne capacity each would be set up in each of these countries by UN with help of the Japanese government.

Speaking about major features that prompted the international forum to pass the resolution, Warsi said that Indore's biogas model was found to be one of the most sustainable, cost effective zero waste model for wet waste management. Besides, its operation and monitoring are also foolproof.

Warsi told TOI, Countries like Bhutan, Nepal, Bangladesh, Japan, Malaysia, Iraq, Maldives, Oman, South Korea are on the list. Warsi said that at least one biogas plant with 50 tonne capacity each would be set up in each of these countries by UN with help of the Japanese government.

## Bhopal's plastic recycling model showcased at World Bank HQ

JamaL.Ayub@timesgroup.com

Bhopal: Bhopal's 'plastic management recycling project', which has been adopted as a model by the Central Pollution Control Board (CPCB), was demonstrated on Tuesday at the Global Environment Facility (GEF) council at the World Bank headquarters in Washington DC.

As part of the project, plastic waste of nearly 7/8 Mts (for plastic less than 40 Microns) is picked, segregated and reused. Bhopal-based Syed Imtiaz Ali, who introduced the facility with the help of BMC under the Swachh Bharat Mission, made a presentation at the conference which had representatives from 165 countries.

"The city's success story is being looked at in terms of plastic waste management, a problem the entire world is



Global Environment Facility CEO & chairperson Naoko Ishii receives a product sample from Bhopal delegation

facing," Ali told TOI. The project's main plant is located at the old BMC dumpyard in Bhanpur. Technical expertise for the project is provided by the UN Development Programme. "Fourteen per cent of Bhopal's waste is plastic. We should aim to reduce plastic use and reuse all of the

output," Ali said. Prabhjot Sodhi from UNDP-India was also present on the occasion.

"I feel proud that this initiative from India is being appreciated by other countries. Developing countries like India need to take the lead in sustainable development. Cities like Bhopal need to im-

prove and set an example for sustainable development," said Ali. Non-recyclable plastic is being put to use by the BMC. Around 2,200 rag-pickers have been enrolled for plastic waste collection.

Sarthak NGO's project director Ali said that the output is being utilised by cement manufacturers as alternate fuel for combustion. Processing of 40 micron plastic bags beyond 1100 degrees Celsius releases unintentionally produced POPs. Co-processing in cement kilns leaves no residue. Around 32,000 MT has been sold to cement plants. The processed plastic has also been used in about 1,900 km of road construction.

According to estimates, around Rs 50 crore worth of such material has been utilised. Much of the material has also been utilised in rural road development.



### 10,000+ students took part in SUPER

This month's SUPER (Students United Program to Encourage Recycling) Program turned out to be a massive hit with 10,000+ students taking part from St. Ann's group of institutions. Really glad to see the future generation learn ways to manage waste responsibly and contribute their part to save the environment.

**The plastics recycling market in India is estimated to grow at a rate of 6.5% to attain a market size of US \$53.72 billion by the end of 2023**

Dr.



# Technology Modification

**Legal Framework**

**Policies**

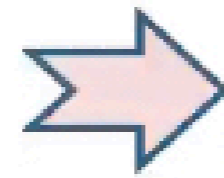
**Geographi  
c/Climatic  
Conditions**

**Social  
Conditions  
and Culture**

**Market Forces**

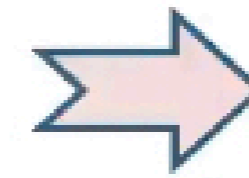
**Input MSW**

- Quantity
- Quality
- Exposure



**Processing Technology**

- Mechanical works
- Civil works
- Process
- Automation level
- Space needs

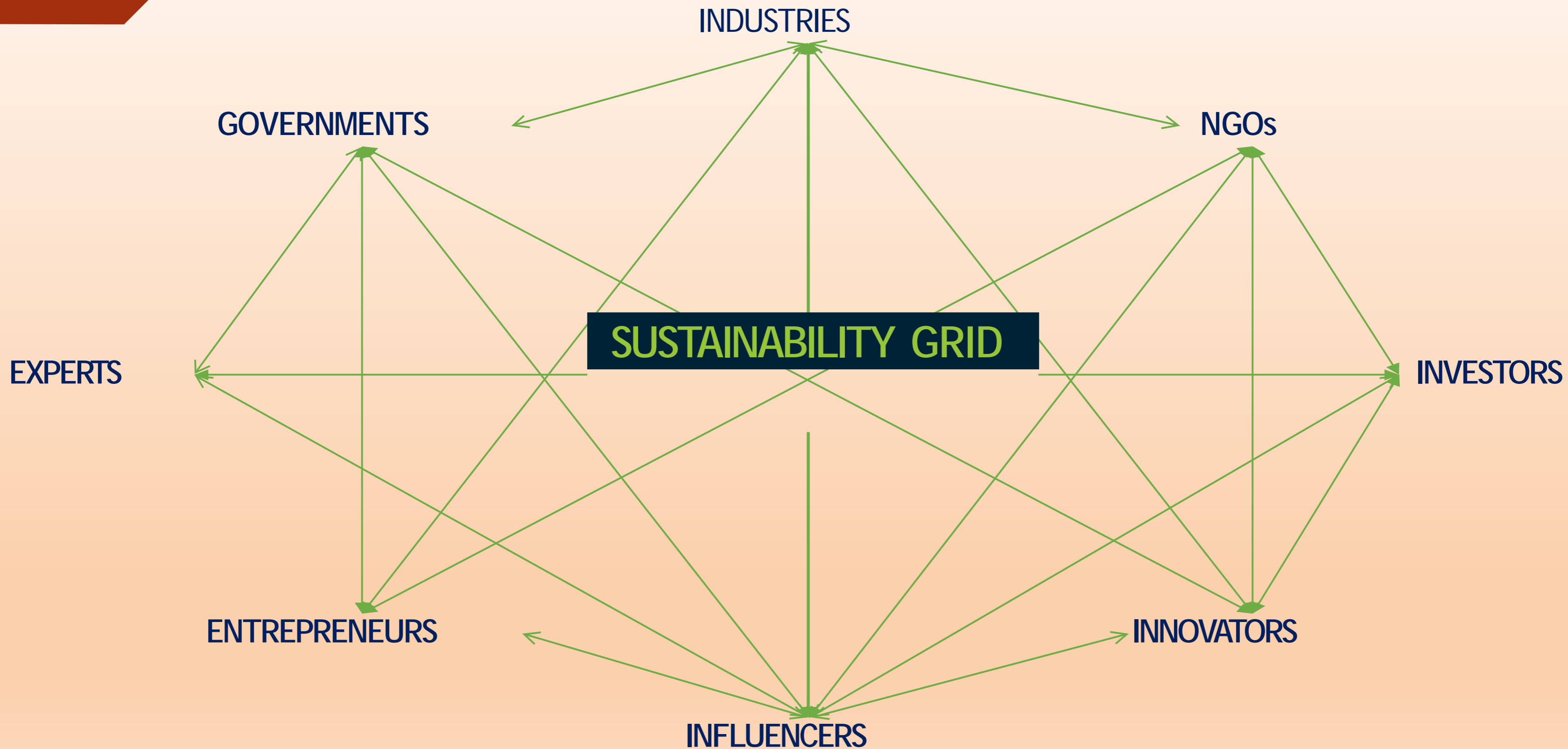


**Output**

- Product type and quality
- Residue quality
- Environmental norms

**Developed Countries**

**Indian  
(Local)  
Scenario**



# Conclusion



Let's come together to help spearhead India as a global leader in circular economy

**Thank  
you**

