

# Understanding Plastic Waste – Global and National Scenario

## Module I



# Session Overview

**Understanding Plastics - Types and Nature**

**Plastic Waste - A Global Overview**

**Plastic Waste in India**

**Single Use Plastic in India**

**Principles of Plastic Waste Management**

**Plastic Waste Management-Contribution to Sustainable Development Goals**



# Understanding Plastics - Types and Nature



# Understanding plastics - types and nature

- The “wonder material” plastic is in extensive use by everyone because of its versatility.
- The challenge is to deal with it after its use.
- Plastic waste, if not managed appropriately, leads to environmental degradation and health hazards.

## The Problem in Numbers
























(Source: <https://icrowdnewswire.com/2019/11/05/the-comfort-slipper-helping-fight-plastic-pollution-the-minimalist-comfort-slipper-made-from-between-3-5-recycled-plastic-bottles-organic-cotton-natural-rubber/>)



# Understanding Plastics - types and nature

The Society of the Plastics Industry (SPI) established a classification system to identify different types of plastics

				Recycling Potential	Economic Value
	PET	Polyethylene Terephthalate			High value plastic
	HDPE	High Density Polyethylene			
	PVC	Polyvinyl Chloride			
	LDPE	Low Density Polyethylene			Low value plastics
	PP	Polypropylene			High value plastics
	PS	Polystyrene			Low value plastics
	OTHER	Others – CDs, multi layer plastics			

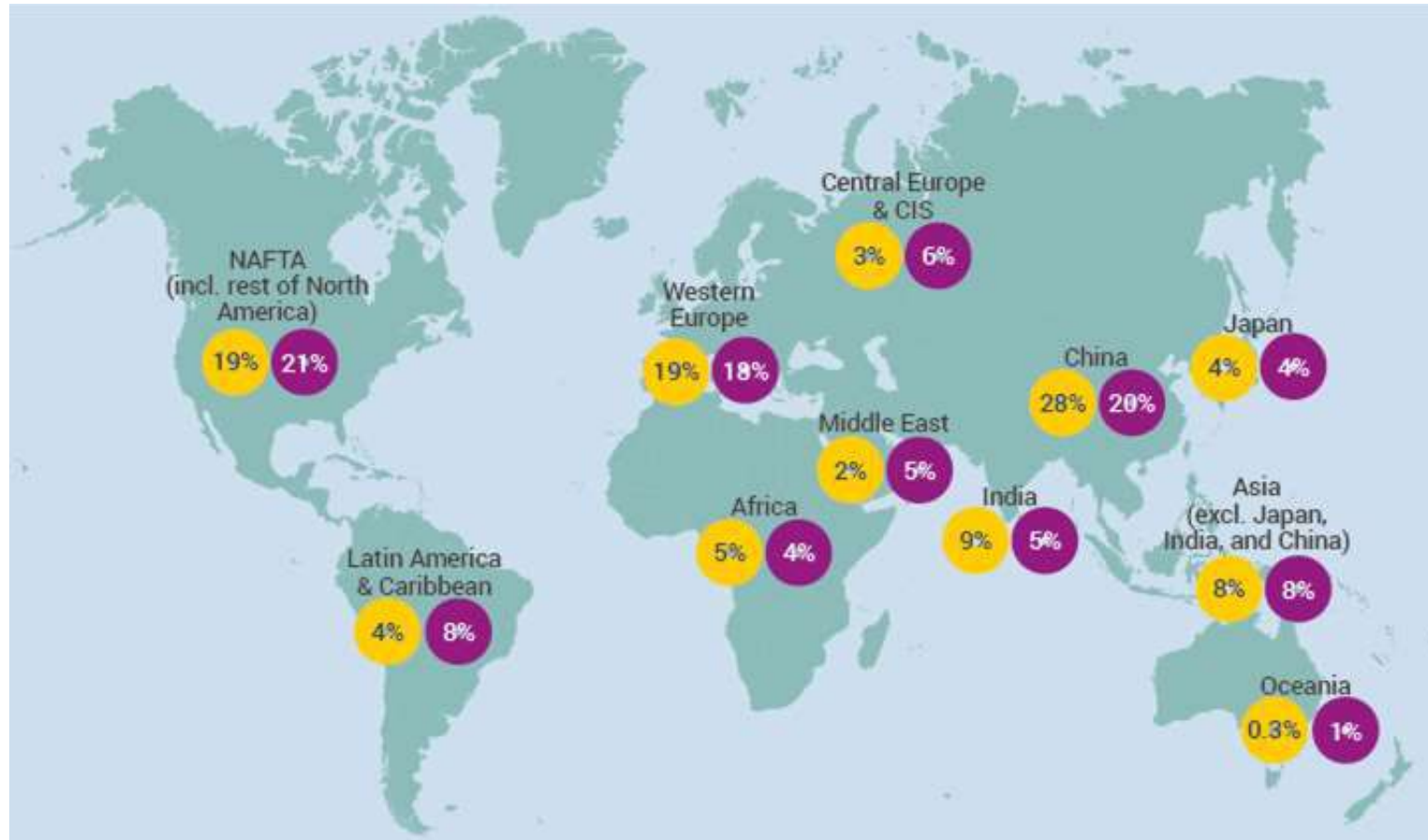






# Plastic Waste - A Global Overview



# Plastic waste generation - Global magnitude of problem



-  Percent share of total production
-  Percent share of total consumption

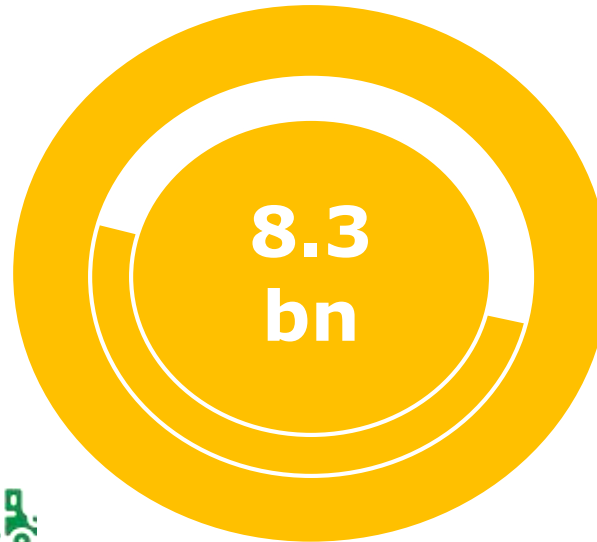
(Sources: "A circular plastics economy strategy for India - 2020" report developed by CII-ITC Centre of Excellence for Sustainable Development)



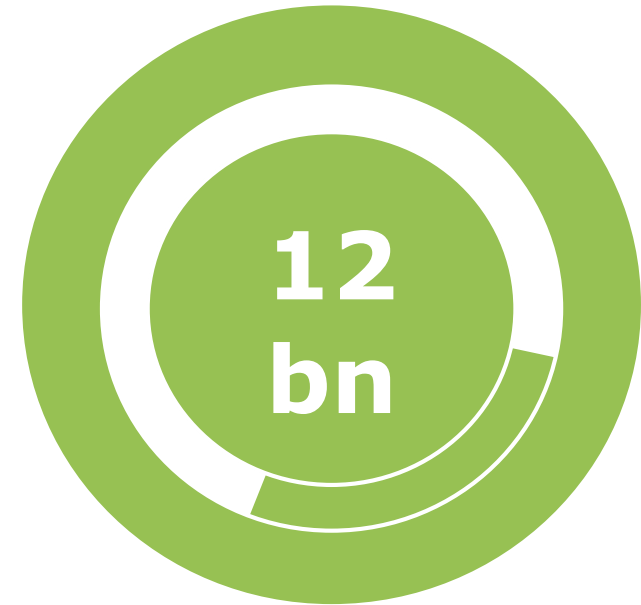
# Plastic waste generation - Global magnitude of problem



**Tonnes of plastic waste generated as of 2015**



**Tonnes of virgin plastic produced till date**



**Tonnes of plastic waste to be generated by 2050, if the current trend continues**

*(Source: "A circular plastics economy strategy for India – 2020" report developed by CII-ITC Centre of Excellence for Sustainable Development)*





# Plastic waste generation - Global magnitude of problem

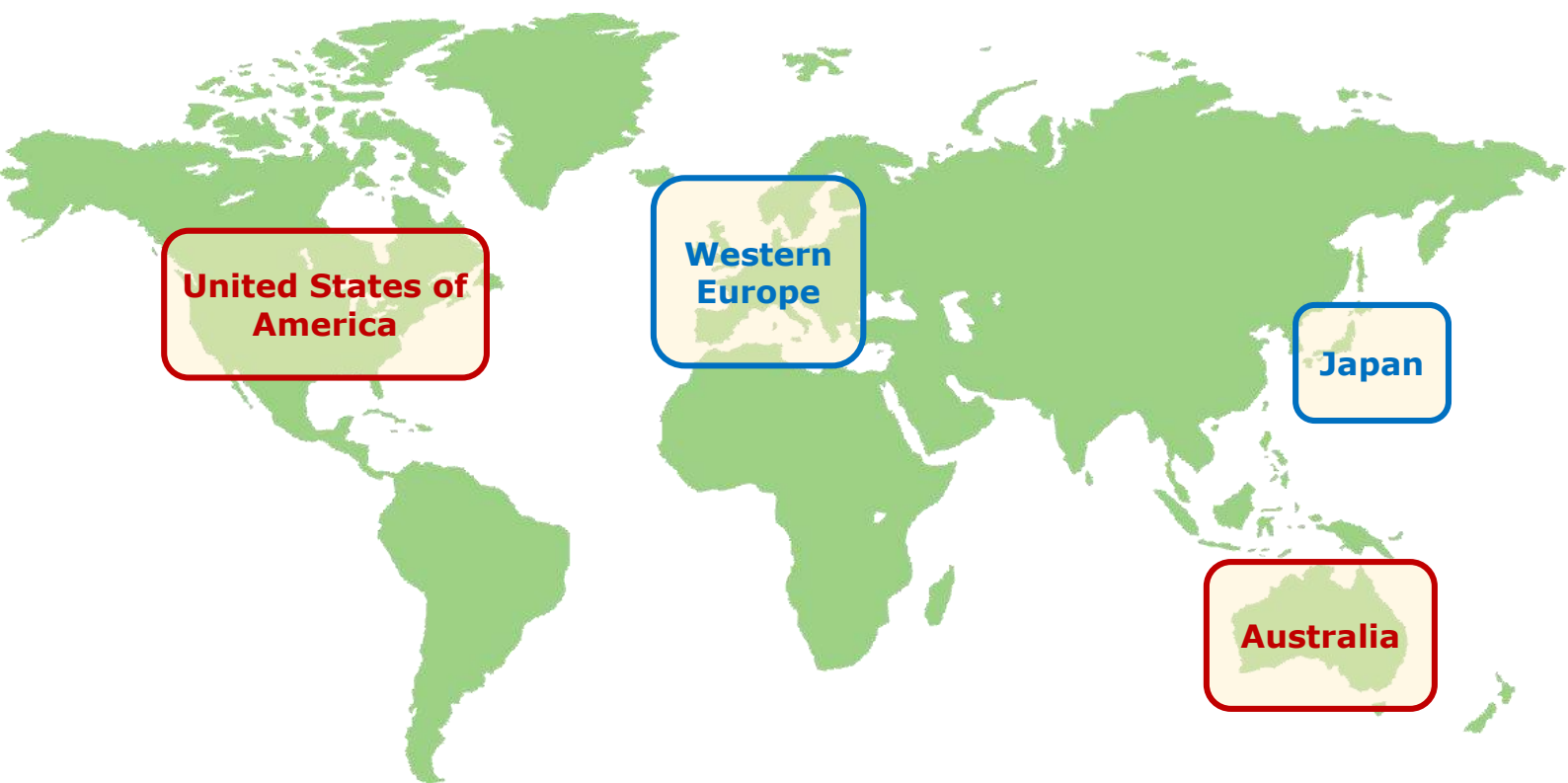


**It is evident that the capacity to manage waste generated due to the prolific use of plastics has been limited**

(Source: CII-ITC Centre of Excellence for Sustainable Development (2020). A circular plastics economy strategy for India – 2020")



# Plastic waste management scenario – Developed countries



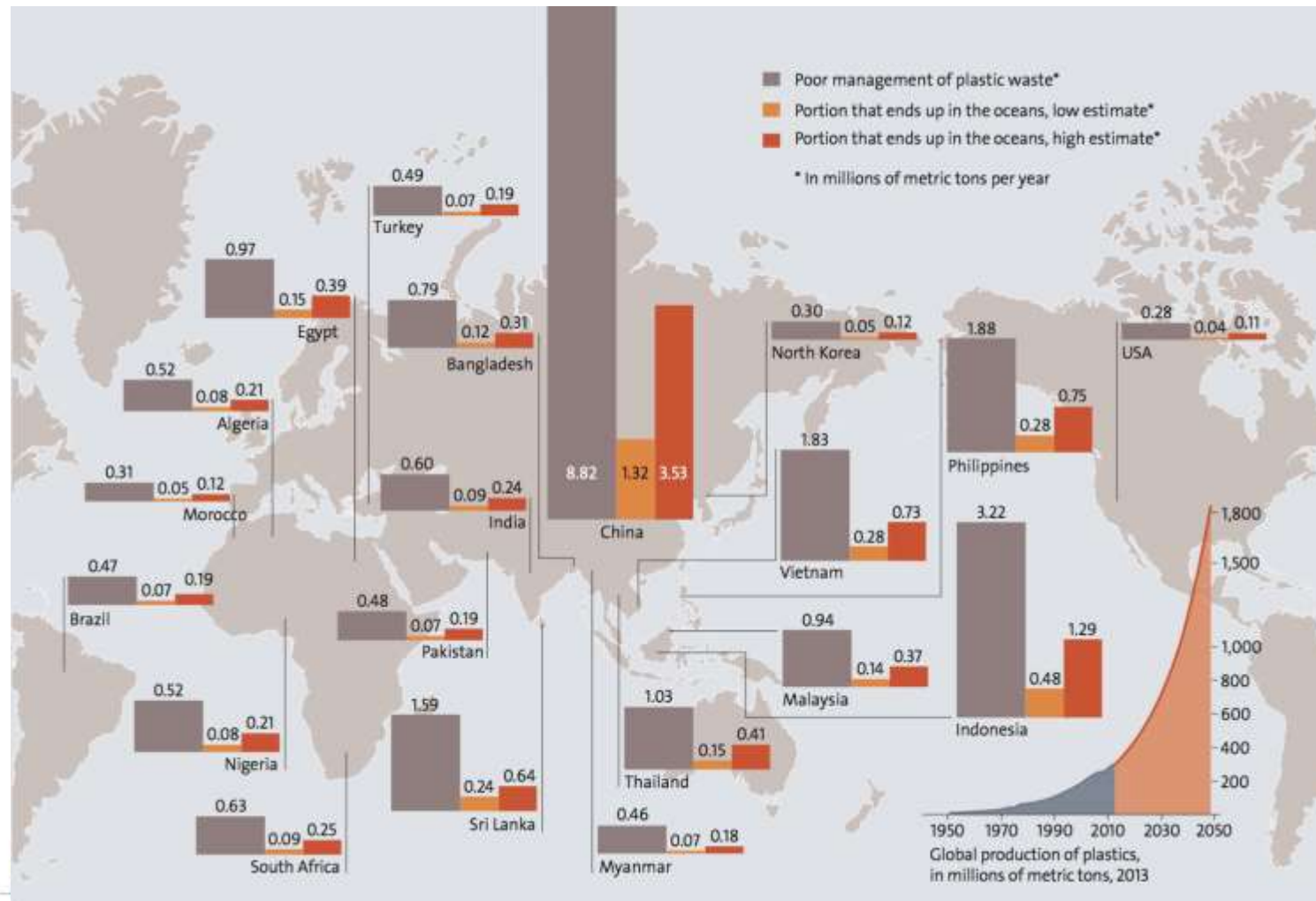
Recycling Rate	Observations
30 %	<ul style="list-style-type: none"><li>• Regulations encouraging recycling through Extended Producer Responsibility (EPR)</li><li>• Consumer responsibility models combined with good traditional waste management infrastructure like landfill and energy recovery</li></ul>
<10 %	<ul style="list-style-type: none"><li>• Limited regulatory impetus and focus on traditional waste management methods i.e. landfill and incineration</li></ul>

(Map: <https://www.pngegg.com/en/png-bohd1/download>  
Source: <https://journals.openedition.org/factsreports/5102>)



# Plastic waste management scenario – Developing countries

## Leakage of plastics waste from 20 countries (in million metric tonnes/year)



- Collection is not systematic
- Informal networks are well developed and organized
- Countries in this category can attain recycling rates in the order of 20%
- Major portion of waste ends up in the ocean, via informal dumps and rivers

(Source :

- "A circular plastics economy strategy for India – 2020" report developed by CII-ITC Centre of Excellence for Sustainable Development
- d'Ambrières, W. (2019) Plastics recycling worldwide: current overview and desirable changes. Field Actions Science Reports [Online], Special Issue 19. Available at <http://journals.openedition.org/factsreports/5102>
- <https://journals.openedition.org/factsreports/5102>,



# Plastic Waste in India



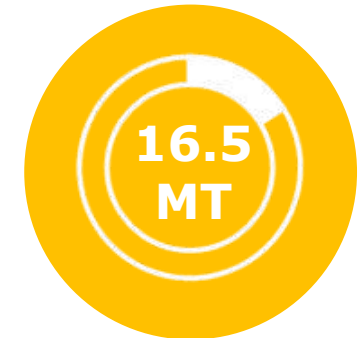


# Plastic waste in India

**Plastic waste generated annually = 11 kg/capita**

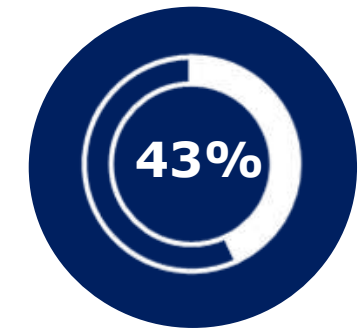
- The annual per capita consumption in India - 20 kg by 2022\*.
- Plastic contributes to 8%\*\* of the total solid waste.
- Collection efficiency - 80.28% \*\*
- Only 28.4%\*\* is treated and remaining disposed in landfills or open dumps.

**India consumes**



**of plastic annually**

**Out of this**



**is used for packaging  
and is single-use in  
nature**

(Sources:

- TERI. Factsheet on plastic waste in India. Available at: <https://www.teriin.org/sites/default/files/files/factsheet.pdf>,
- [https://sustainabledevelopment.in/wp-content/uploads/2020/06/1589884216Manage-Plastics-Report\\_web.pdf](https://sustainabledevelopment.in/wp-content/uploads/2020/06/1589884216Manage-Plastics-Report_web.pdf),
- MoHUA (2019). Plastic Waste Management-Issues, Solutions & Case Studies.  
<http://164.100.228.143:8080/sbm/content/writereaddata/SBM%20Plastic%20Waste%20Book.pdf>)

\*The Ministry of Petroleum and Natural gas estimates.

\*\*As per CPCB report as on 2014





# Single Use Plastics (SUPs) in India

**More than 20 states and union territories have announced a complete or partial ban on single-use plastics as a strategy to prevent it.**

## Why BAN....?

- Made from fossil fuel with very small life cycle
- Huge carbon footprint
- High quantity usage and waste production currently
- Non-biodegradable
- Only small percentage is recycled – difficult to segregate in Indian context
- Causes health issues – hormone disruption & cancer
- Pollutes environment – leaches toxins
- Kill animals and birds – through marine pollution
- Enters our food chain



# Single Use Plastic in India



# What are Single Use Plastics?

- **No comprehensive definition in India**
- Each state has a different definition of the term

Disposable plastics, are commonly used for plastic packaging and include items intended to be used only once before they are thrown away or recycled.

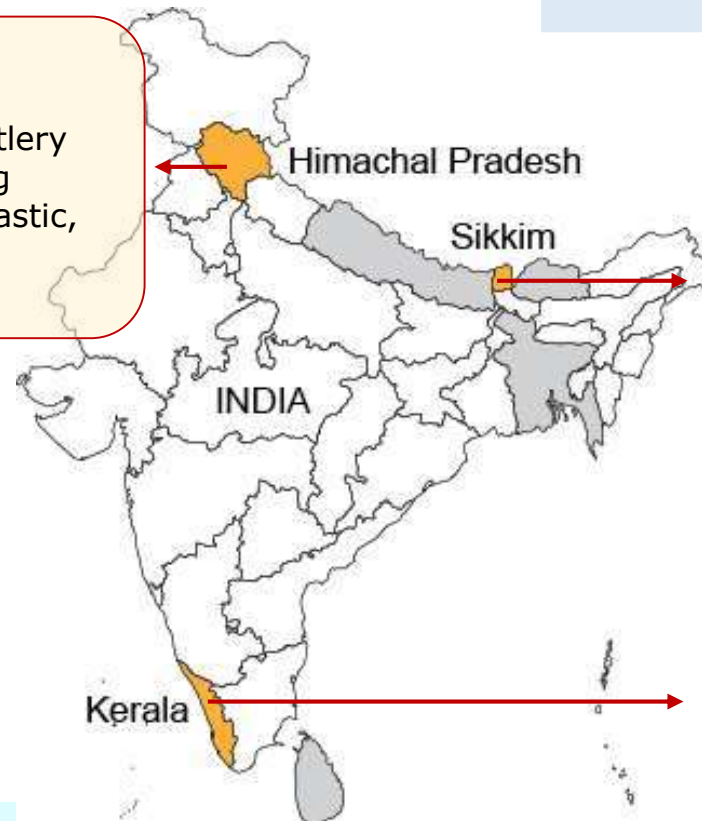
*Defined by UN Environment*

**Year:** 2011

**Banned SUP Products:**

Thermocol cutlery, additional plastic cutlery such as spoons, bowls, katories, stirring sticks, forks, knives, straws made of plastic, food packages

**Key Action:** Penal action instituted



**Year:** 2016

**Banned SUP Products:**

Water bottles, disposable items such as cups, plates, spoons, containers and similar items made from PS foam

**Key Action:** Ban on use of packaged drinking water bottles and use of water dispenser or reusable bottle encouraged

**Year:** 2020

**Banned SUP Products:**

Plastic carry bags, non-woven carry bags, plastic flex banners, flags, and buntings, plastic, plates, cups, straws, spoons, bottles, pouches, plastic sheets, plastic cling films, plastic beads and decorations. *(not applicable on milk pouches and food-grade plastic of more than 50 microns, agricultural product medical packets, raincoats, tarpaulin sheets and pens)*

**Key Action:** Ban on manufacturing, sale and storage of single-use plastic products and penalty imposed

(Source of Map: <https://d-maps.com/>)





# What are Single Use Plastics? (Contd.)

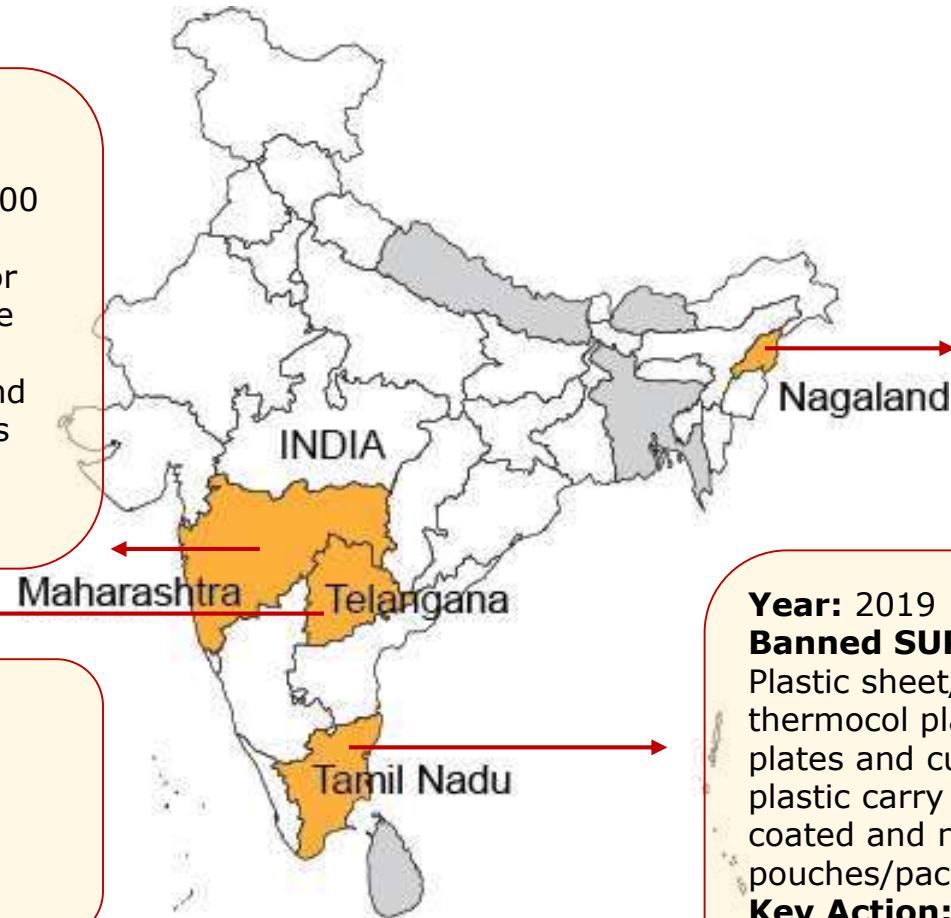
**Year: 2018**

**Banned SUP Products:**

Drinking water PET bottles of below 200 ml, plastic mineral water pouches, plastic shopping bags with or without handles, single-use disposable items made of thermocol-like cups, plates, saucers, spoons and straws and single-use plastic decoration materials

**Key Action:**

Penal action instituted



**Year: 2019**

**Banned SUP Products:**

Plastic carry bags, plastic cutlery and decorative items made of Styrofoam (thermocol), polythene, nylon, poly-vinyl-carbohydrites, poly-propylene and polystyrene

**Key Action:**

Ban on manufacturing, storage, supply, sale of indicated products.

**Year: 2019**

**Banned SUP Products:**

Single use plastics

**Key Action:**

Prohibit sale and use of SUPs within municipal limits

**Year: 2019**

**Banned SUP Products:**

Plastic sheet/film for food wrap, dining table cover, thermocol plates and cups, plastic-coated paper plates and cups, plastic tea cups, plastic tumbler, plastic carry bags of all sizes/thicknesses, plastic-coated and non-woven carry bags, water pouches/packets, plastic straws and plastic flags.

**Key Action:**

Ban on manufacturing, storage, supply, sale of indicated products.

(Source of Map: <https://d-maps.com/>)



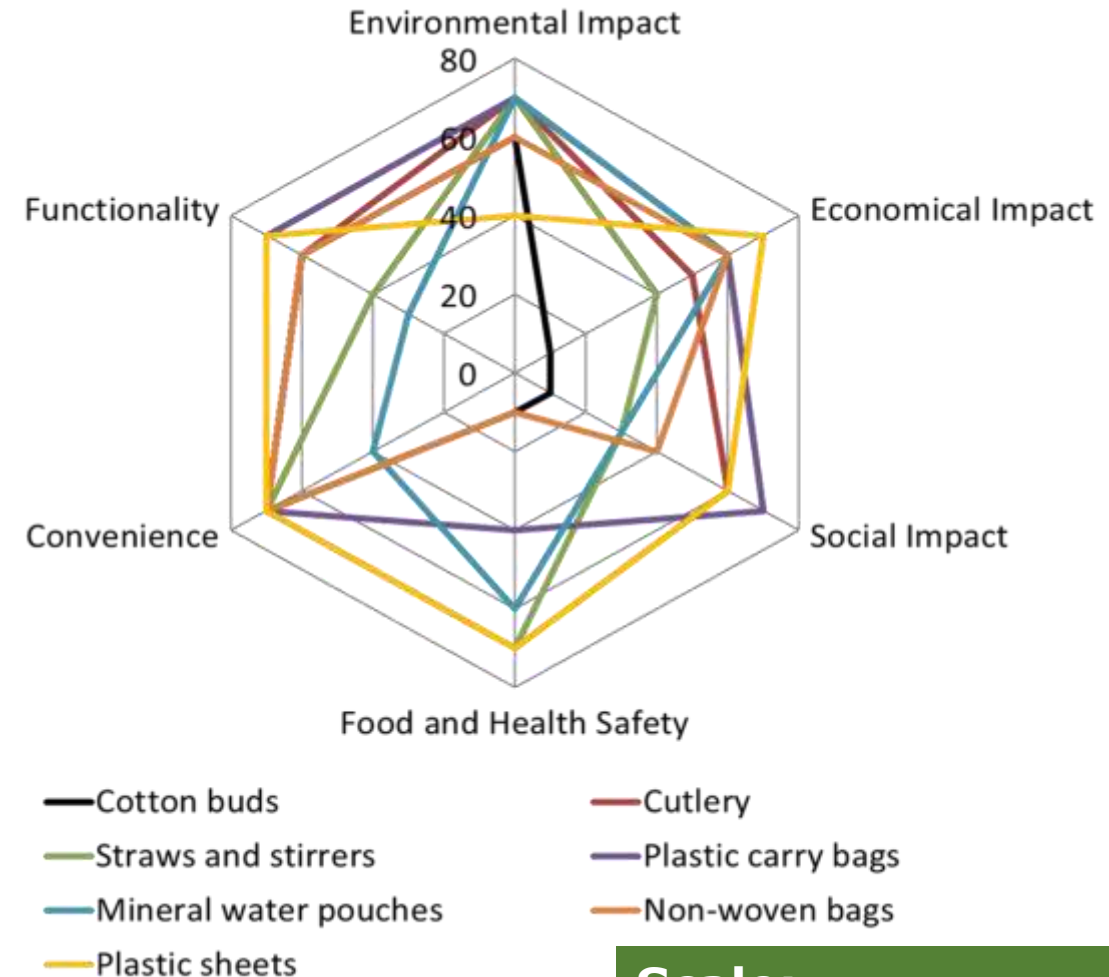
# Basis of implementing ban / Phase-out of SUPs

Phase-out or ban of specific products to be decided primarily through on a comparative analysis between SUPs and simultaneous alternative based on following parameters

- Functionality of the product
- Convenience for user
- Food and health safety
- Social impact
- Economic impact
- Environmental impact (EIA, LCA, carbon Footprint)

**When the alternatives outweigh SUPs on the above parameters, it is suggested to that SUPs**

(Source: <https://www.aipma.net/Industry-Update/May2019/INDUSTRY-PERSPECTIVE-ON-SUP.pdf>, Retrieved November 2019)



**Scale:**

High -  $\geq 70$

Medium - 40-60

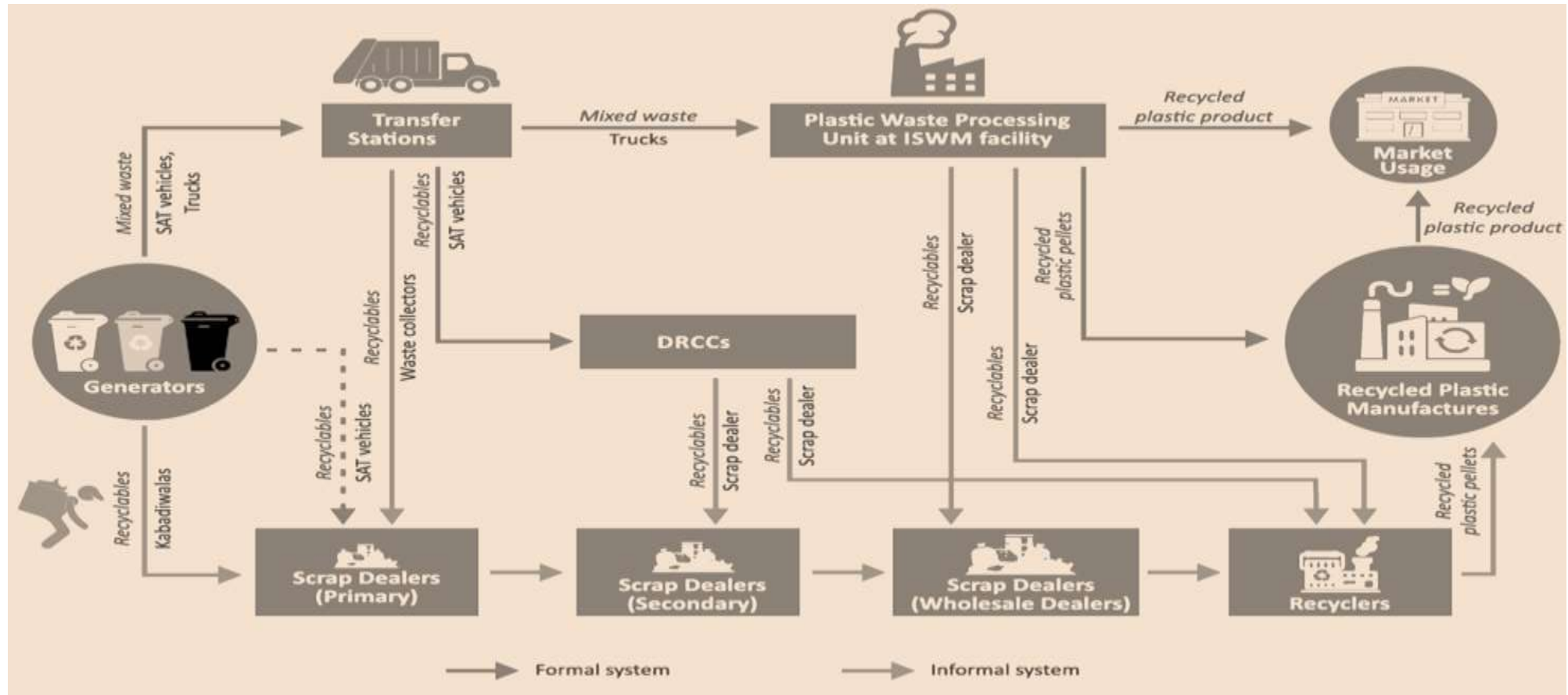
Low - 10-40

Negligible -





# Plastic waste management value chain in Indian Cities



(Source: Developed by ICLEI –SA as part Enhancing Circular Economy Perspectives - Plastic Waste Management Strategy and Action Plan for Greater Hyderabad Municipal Corporation (GHMC) project)



# Principles of Plastic Waste Management



# Approach towards sustainable PWM - Waste management hierarchy

Most Preferred

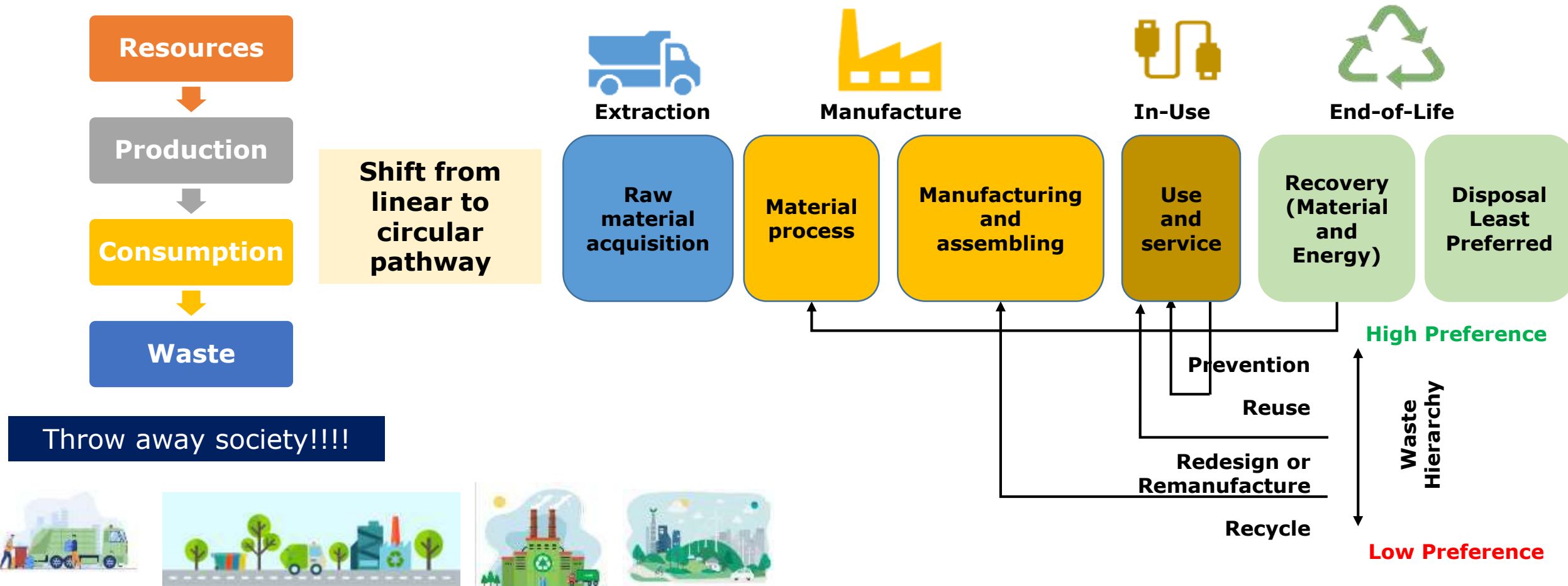


Least Preferred



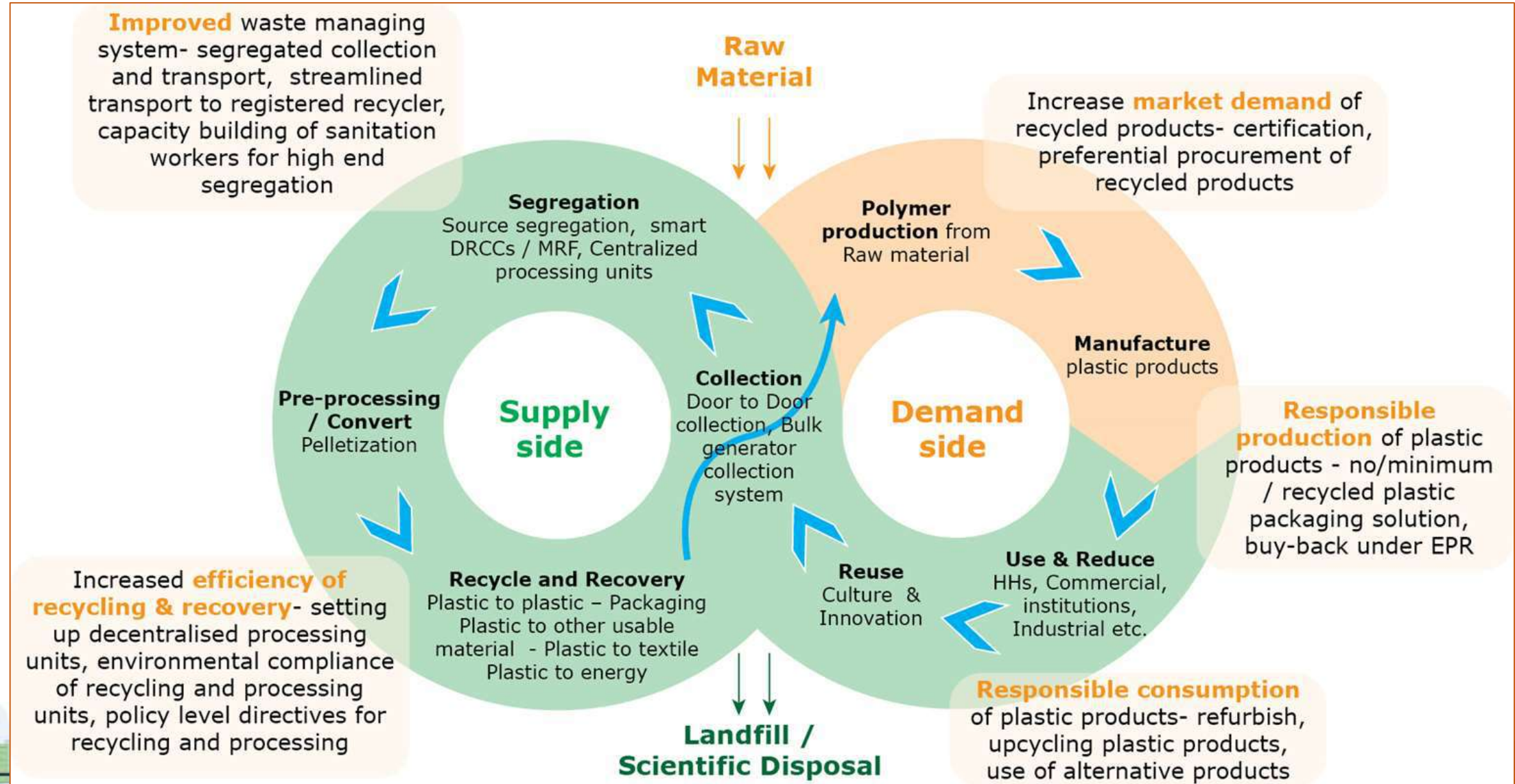
# Approach towards sustainable waste management

- The strategy should consider shifting from linear to circular pathway integrating the concept of waste management hierarchy





# Evolving PWM strategies across circular economy pathway





# Plastic Waste Management - Contribution to Sustainable Development Goals (SDGs)

Holistic PWM can reduce environmental pollution, leading to lesser health risks.

3 GOOD HEALTH AND WELL-BEING



Technological practices of PWM for collection, segregation, recycling and processing can foster small- and large-scale business contributing to economic growth

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



8 DECENT WORK AND ECONOMIC GROWTH



1 NO POVERTY



Managing plastic waste can generate livelihood opportunities for informal sector addressing poverty

Sustainable PWM value chain and infrastructure can promote technological, management, and financial innovations in industry



# Plastic Waste Management - Contribution to Sustainable Development Goals (SDGs) (Contd.)

Holistic PWM can contribute to mitigation of emissions through energy recovery and recycling

Holistic PWM with sustainable value chain leads to reduction in waste leakage to marine environment, that can otherwise affect aquatic life

PWM strategies such as 6Rs, shift to alternatives, redesigning for recycling can lead to responsible consumption and production

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION



14 LIFE BELOW WATER



17 PARTNERSHIPS FOR THE GOALS



International partnerships and collaboration can promote sustainable PWM



# India's commitment towards SDG 14



SDG 14.1 target: By 2025 prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

## Key initiatives taken to achieve the target

- The Indian Prime Minister made several announcements about completely phasing out single-use plastics in India. Most recently, on 2 October, Mr Modi urged India's citizens to give up single-use plastic by 2022.
- 18 states/UTs have imposed complete ban on plastic carry bags/products.
- 5 states have imposed the partial ban on plastic carry bags/products at religious/historical places.



# India's commitment towards SDG 14



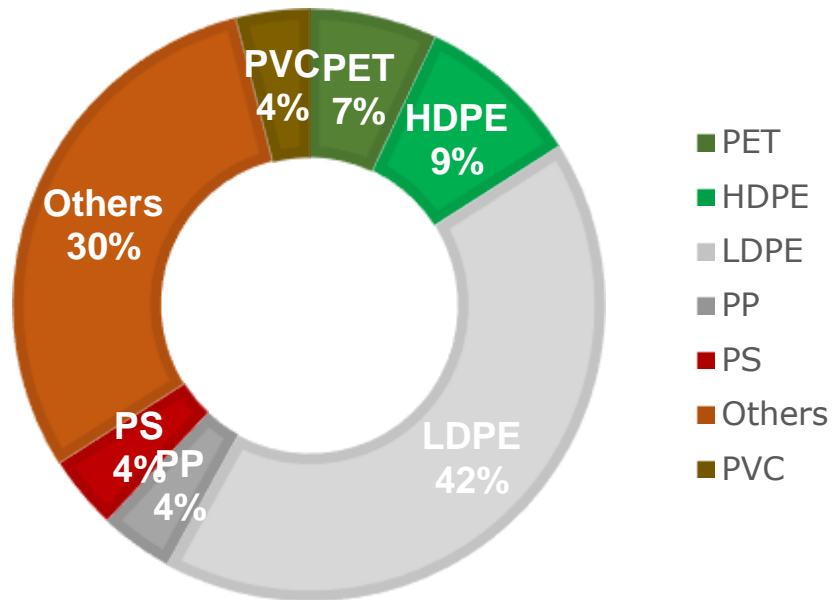
## Key initiatives taken to achieve the target

- India pledged to ensure area around 100 historic monuments plastic free (upto 500 m. around a historic area)
- Plastic Waste Management Rules 2016, followed by 1st amendment in 2018 and expected amendment in 2021.
- Guideline Document Uniform Framework for Extended Producers Responsibility (Under Plastic Waste Management Rules, 2016)
- Guidelines on use of Plastic Waste in Road Construction (Provisional), 2019
- Indian Road Congress Guidelines for the Use Of Waste Plastic In Hot Bituminous Mixes (Dry Process) In Wearing Courses (IRC:SP: 98-203), 2013
- Guidelines on Usage of Refuse Derived Fuel in Various Industries, 2018
- An agreement between UNEP and BCCI (The Board of Control for Cricket in India) signed to reduce waste generated during cricket matches.

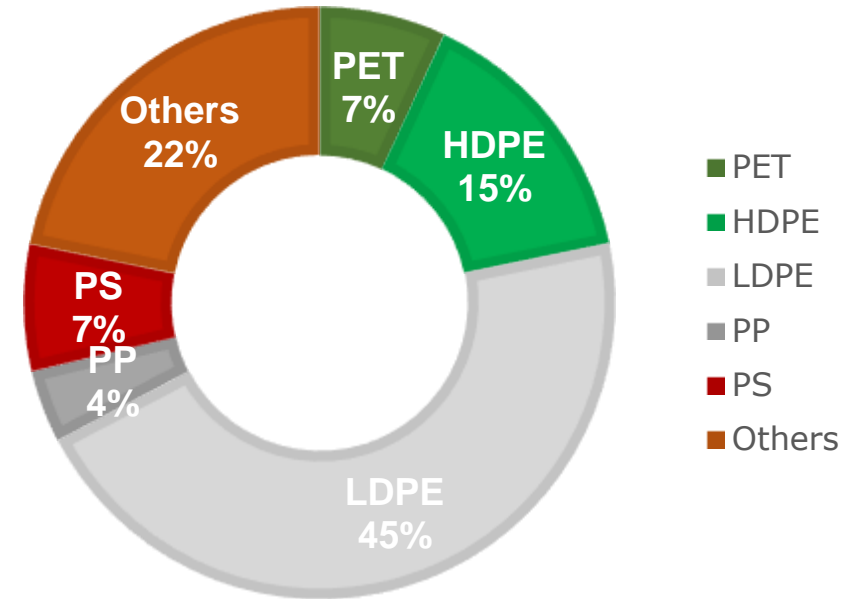


# Sources of plastic waste in cities - Example of Hyderabad

**MIG & HIG**



**LIG**

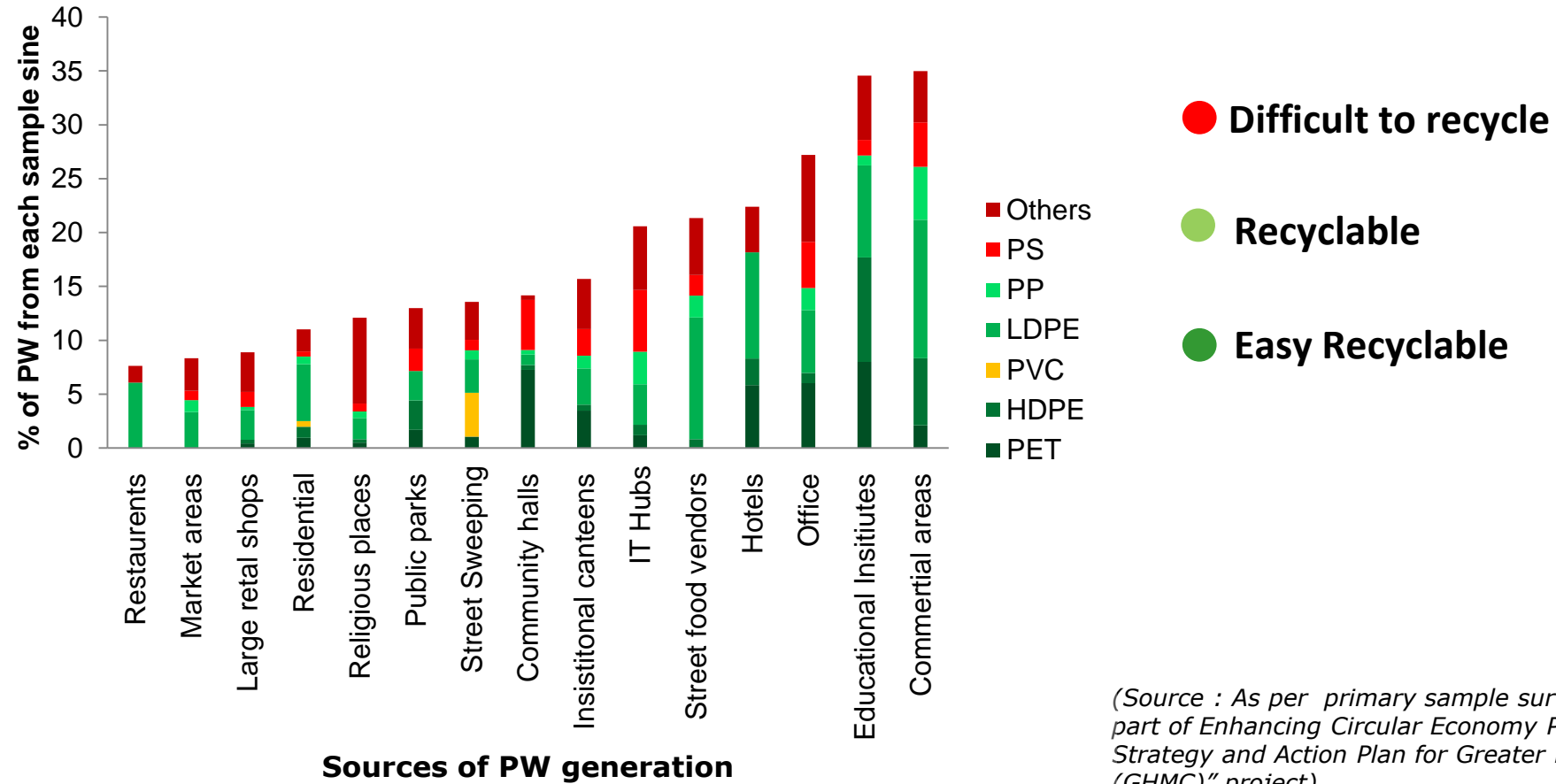


(Source : As per primary sample survey conducted by ICLEI –South Asia as part of Enhancing Circular Economy Perspectives - Plastic Waste Management Strategy and Action Plan for Greater Hyderabad Municipal Corporation (GHMC) project)





# Sources of plastic waste in cities - Example of Hyderabad (Contd.)



(Source : As per primary sample survey conducted by ICLEI -South Asia as part of Enhancing Circular Economy Perspectives - Plastic Waste Management Strategy and Action Plan for Greater Hyderabad Municipal Corporation (GHMC)" project)



# Exercise I (15 mins): To understand the sources of plastic waste in cities

Make teams of 3 to 5 members each

- List down the main sources of plastic waste within the city
- Divide list to high value and low value plastics in terms of recycling potential/economic value
- Identify bulk generators of plastic waste in your city



# Exercise II (15 mins)- To understand circularity

Make teams of 5 or more members each with different back grounds

- Define single use plastics for your city or state
- Identify measures that you can take in your city to promote the 6Rs – identify at least 1 measure for each R.



# END OF MODULE I







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### Disclaimer

The Training Modules on developing 'Plastic Waste Management Strategy and Action Plan for Urban Local Bodies(ULBs)' is prepared by ICLEI-Local Governments for Sustainability, South Asia under the contract- Development of Knowledge, Training and Capacity Building Materials on Plastic Waste Management based on the activities of GHMC, supported by the IGES Centre Collaborating with UNEP on Environmental Technologies (CCET). The views expressed in this document do not necessarily represent the official decision or stated policy of the United Nations Environment Programme. The citing of trade names in this document does not constitute any endorsement.

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