








Plastics and its Problems

Why in news?

Plastic recycling could be a solution to growing problems of plastics.

What are plastics?

- Plastics are a group of materials, either synthetic or naturally occurring, that may be shaped when soft and then hardened to retain the given shape.
- Plastics are polymers. A polymer is a substance made of many repeating units
- Plastics can be divided into two general categories-thermoplastics and thermosets.
 - Thermoplastics are defined as polymers that can be melted and recast almost indefinitely.
 - Thermosets is a polymer that irreversibly becomes rigid when heated

POLYMER TYPES	EXAMPLES OF APPLICATIONS	SYMBOLS
Polyethylene Terephthalate (PET)	Fizzy drink and water bottles. Salad trays.	 PET
High Density Polyethylene (HDPE)	Milk bottles, bleach, cleaners and most shampoo bottles.	 HDPE
Polyvinyl Chloride (PVC)	Pipes, fittings, window and door frames (rigid PVC). Thermal insulation (PVC foam) and automotive parts.	 PVC
Low Density Polyethylene (LDPE)	Carrier bags, bin liners and packaging films.	 LDPE
Polypropylene (PP)	Margarine tubs, microwaveable meal trays, also produced as fibres and filaments for carpets, wall coverings and vehicle upholstery.	 PP
Polystyrene (PS)	Yoghurt pots, foam hamburger boxes, plastic cutlery, protective packaging for electronic goods and toys. Insulating material in the building and construction industry.	 PS
Unallocated references	Any other plastics that do not fall into any of the above categories - for example polycarbonate which is often used in glazing for the aircraft industry.	 0

What are the advantages of plastics?

- Low production cost.
- Could be molded easily.
- Lightweight, translucent, transparent, and opaque.
- Resistant to corrosion.
- Poor conductor of heat and electricity.
- Minimize the food wastage.

What are the disadvantages of plastics?

- Plastics manufacturing also involves the addition of potentially hazardous compounds like stabilizers or colorants.
- Most plastics are non-biodegradable and they might take a long time to decompose
- Plastic materials clog waterways, oceans, seas, lakes etc.

- 1 in 3 species of marine mammals have been found entangled in marine litter.
- Eating food out of plastic containers may cause cancer.
- Many animals eat plastic materials and die
- Few additives such as phthalates etc. which are added in plastics to prevent its structure may cause serious hormonal imbalance in males and females.

What is recycling of plastics?

- Plastic recycling has been described as the process of recovering scrap or waste plastics and reprocessing the material into useful products
- The two methods of recycling of plastics are
 - **Traditional Recycling** - The traditional recycling method involves melting plastics and processing them into new plastic products
 - **Advanced Recycling** - Advanced recycling is a process through which the effect of chemicals breaks down plastic material.
 - This method consists of three other techniques. These techniques include *pyrolysis*, *chemical recycling*, and *gasification*

What are the reasons for low rate of plastic recycling?

- **Segregation** - Unsegregated plastic waste being ended up in landfills and water systems.
- Lack of segregation of plastic waste at a local community level.
- Segregation of plastic at household level has remained largely unsuccessful.
- **No market** - For plastics recycling for 5 types of plastics except Polyethylene terephthalate, high-density Polyethylene (HDPE).
- **Virgin plastics** - Being cheaper than recycled plastics
- **Multi-layered plastics** - The plastics having multilayer are hard for recycling
- **Lightweight flexible packaging** - This industry is booming but it is non-recyclable

What are the efforts taken by India to mitigate plastics pollution?

- Since July 1, 2022, India has banned the manufacture, import, stocking, distribution, sale, and use of single-use plastic items with low utility and high littering potential.
- **Plastic Waste Management Amendment Rules, 2021** - prohibits identified single use plastic items by 2022
- Thickness of plastic carry bags increased from 50 to 75 microns from 2021 and to 120 microns with effect from the 2022
- **Plastic Waste Management Amendment Rules, 2022**- The guidelines provide a framework to Strengthen the circular economy of plastic packaging waste
- Promote the development of new alternatives to plastic packaging
- Provide the steps for moving towards sustainable plastic packaging by businesses

What is the way forward?

- To create a viable market for plastics other than
- To use eco-friendly products like bamboo, jute, coconut etc.. to replace plastics
- Use of circular model economy

The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

Quick facts

- Around 85% of plastic packaging worldwide ends up in landfills.
- Plastic production set to triple globally by 2060
- only 9% of annual plastic waste recycled

References

1. [The Hindu Business Line | Plastics](#)
2. [The Indian Express | Recycling Of Plastics](#)

