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.	1 PET
High Density Polyethylene (HDPE)	Milk bottles, bleach, cleaners and most shampoo bottles.	2 HDPE
Polyvinyl Chloride (PVC)	Pipes, fittings, window and door frames (rigid PVC). Thermal insulation (PVC foam) and automotive parts.	3 PVC
Low Density Polyethylene (LDPE)	Carrier bags, bin liners and packaging films.	4 LDPE
Polypropylene (PP)	Margarine tubs, microwaveable meal trays, also produced as fibres and filaments for carpets, wall coverings and vehicle upholstery.	5 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.	6 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.	7 O

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 expect 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

IAS PARLIAMENT
Information is Empowering
A Shankar IAS Academy Initiative