Plastic Pollution

December 28, 2018

Manifest Pedagogy

Plastic is a primary pollutant which affects the environment in many aspects. The types of plastics and their ill effects are important for prelims and the Plastic Waste Management rules, 2016, and amendment rules, 2018 are to be studied for mains. The innovative ways to solve the plastic menace along with the efforts put by Central Government and State Government are important.

In news

Ban of plastic in many states

Placing it in syllabus

Environmental conservation

Static dimensions

1. Plastic and its types
2. Harmful effects of plastic
3. The Plastic Waste Management Rules, 2016

Current Dimensions

The Plastic Waste Management (Amendment) Rules, 2018

Content

Plastic is an essential component of many items, including water bottles, combs, and beverage containers.

Plastics can be divided into two major categories:

1. **Thermoset or thermosetting plastics**

Once cooled and hardened, these plastics retain their shapes and cannot return to their original form. They are hard and durable. Thermosets can be used for auto parts, aircraft parts and tyres. Examples include polyurethanes, polyesters, epoxy resins and phenolic resins.

2. **Thermoplastics**

Less rigid than thermosets, thermoplastics can soften upon heating and return to their original form. They are easily moulded and extruded into films, fibres and packaging. Examples include polyethylene (PE), polypropylene (PP) and polyvinyl chloride (PVC). Let’s look at some common plastics.

The types of thermoplastic include:

- **Polyethylene Terephthalate** (PETE or PET) – this plastic is one of the most commonly used on the planet example- all plastic bottles and containers. PET is well-known for spreading the poisonous antimony. According to a survey the antimony present in a water bottle is 100 times more than it is present in the groundwater level. People who have been exposed to antimony for a longer period of time have showed signs of respiratory distress and skin diseases.
- **High-Density Polyethylene (HDPE) –** It was first used for pipes in storm sewers, drains, and culverts. Today, this plastic is used for a wide variety of products. Like PET, it is also considered “safe,” but has been shown to leach estrogenic chemicals dangerous to foeti and juveniles.
- **Polyvinyl Chloride (PVC) –** PVC is one of the oldest synthetic materials in industrial production. It has been called the “poison plastic” because it contains numerous toxins and is harmful to our health and the environment. Dioxins are formed when PVC is burnt.

Dioxins are human carcinogens and are one of the harmful chemical substances that have been tested.

- **Low-Density Polyethylene (LDPE)** – LDPE was the first polyethylene to be produced, making it the godfather of the material. Packaging and containers made from LDPE make up about 56% of all plastic waste, 75% of which comes from residential households. LDPE is very difficult to recycle and has shown signs of releasing nonylphenol when exposed to sunlight.
- **Polypropylene (PP)** PP actually has a high heat tolerance and as such, does not seem to leach many of the chemicals other plastics do. E**xamples**include bottle tops, bottles, and fittings.
- **Polystyrene or Styrofoam (PS)** – Since polystyrene is lightweight and easy to form into plastic materials, it also breaks effortlessly, making it more harmful to the environment. Beaches all over the world are littered with pieces of polystyrene, endangering the health of marine animals. Polystyrene can leach styrene, a suspected carcinogen, especially in the presence of heat.
- **Miscellaneous plastics** (Includes: Polycarbonate, polylactide, acrylic, acrylonitrile butadiene, styrene, fiberglass, and nylon

Micro plastics and issues surrounding it

Micro-plastics are those super tiny beads (typically around 1 millimetre), that can be found in body and facial scrubs, as well as other personal care products.

Problems with micro plastics are:

1. **Cosmetic Plastic Exposure-** micro plastic can have hormone disrupting effects on the body, which can lead to thyroid problems, infertility, and an increased risk of cancer.
2. **Wildlife contamination-** Micro-plastics make their way

into rivers, lakes, and oceans when discarded, polluting wildlife. It can have toxic consequences for animals, and can contaminate the fish we consume.

3. **Gingivitis-** Micro-beads in toothpastes can get trapped on the gum line, retaining bacteria and leading to gingivitis, gum disease, and other infections.
4. **Contaminated sea salt-** Micro-plastics can make their way into sea salt found in grocery stores, adding to the plastic body burden.

Not only they are chemical particles that come in close contact with your skin, which can absorb toxins, but they also create huge problems for wildlife, fish, and the environment.

Magnitude of the problem in India

- The per capita consumption in India is still low compared to more developed countries. According FICCI, Indians consume 11 kg of plastic per year in comparison to 109 kg by an average American. But this figure is estimated to rise in the coming years. To avert a crisis would require vision, political will and the nerve to pull off a balancing act.
- India alone generates about 4354 tonnes of plastic waste every day.
- Even though there is a complete ban on coloured polythene bags in India, one can find them in abundance in almost every part of the country.

The Plastic Waste Management Rules, 2016

These rules aim to:

- Increase minimum thickness of plastic carry bags from 40 to 50 microns and stipulate minimum thickness of 50 micron for plastic sheets also to facilitate collection and recycle of plastic waste
- Expand the jurisdiction of applicability from the

municipal area to rural areas, because plastic has reached rural areas also

- To bring in the responsibilities of producers and generators, both in plastic waste management system and to introduce collect back system of plastic waste by the producers/brand owners, as per extended producers responsibility
- To introduce collection of plastic waste management fee through pre-registration of the producers, importers of plastic carry bags/multilayered packaging and vendors selling the same for establishing the waste management system
- To promote use of plastic waste for road construction as per Indian Road Congress guidelines or energy recovery, or waste to oil etc. for gainful utilization of waste and also address the waste disposal issue; to entrust more responsibility on waste generators, namely payment of user charge as prescribed by local authority, collection and handing over of waste by the institutional generator, event organizers.
- An eco-friendly product, which is a complete substitute of the plastic in all uses, has not been found till date. In the absence of a suitable alternative, it is impractical and undesirable to impose a blanket ban on the use of plastic all over the country. The real challenge is to improve plastic waste management systems.

The Plastic Waste Management (Amendment) Rules, 2018

- The amended Rules lay down that the phasing out of **Multilayered Plastic (MLP)** is now applicable to MLP, which are "non-recyclable, or non-energy recoverable, or with no alternate use."
- The amended Rules also prescribe a **central registration system for the registration of the producer/importer/brand owner.**

- The Rules also lay down that any mechanism for the registration should be automated and should take into account ease of doing business for producers, recyclers and manufacturers.
- **The centralized registration system will be evolved by Central Pollution Control Board (CPCB)** for the registration of the producer/importer/brand owner. While a national registry has been prescribed for producers with presence in more than two states, a state-level registration has been prescribed for smaller producers/brand owners operating within one or two states.

Environment day theme of this year and its importance

- India was the global host of 2018 World Environment Day.
- With "Beat Plastic Pollution" as the theme for this year's edition, the world is coming together to combat single-use plastic pollution.
- "Beat Plastic Pollution", the theme for World Environment 2018, urges governments, industry, communities and individuals to come together and explore sustainable alternatives and urgently reduce the production and excessive use of single-use plastic polluting our oceans, damaging marine life and threatening human health.

Link with Ghost fishing (already posted on Manifest 11)

Solutions

- **Waste-to-energy (WTE) plants** that incinerate municipal wastes to produce energy have been hailed as a solution to the gargantuan problem. Apart from several state and city-level governments, the Centre also plans to invest in 100 such plants by 2020. But such plants would contribute to air pollution, besides derailing plastic waste management efforts.

Since India’s waste has high organic content, its calorific value is typically lower than what is required to run WTE plants. In other words, to make WTE plants effective, plastic content with higher calorific values has to be increased in the municipal waste.

- **Substitution of plastic with other biodegradable materials** such as reused cotton or paper.

Test yourself: Mould your thoughts

Explain the types of plastics and their ill effects. How effectively will the Plastic Waste Management Rules, 2016 and amendment rules, 2018 solve plastic pollution?