



## General Studies-3; Topic: Conservation, environmental pollution and degradation

### Marine Plastic Pollution

#### Introduction

- Over 300 million tons of plastic are produced every year for use in a wide variety of applications.
- At least 8 million tons of plastic end up in our oceans every year, and make up 80% of all marine debris from surface waters to deep-sea sediments.

#### Plastic Pollution

- Plastic pollution threatens food safety and quality, human health, coastal tourism, and contributes to climate change.
- It also threatens ocean health, food safety and quality, human health, coastal tourism, and contributes to climate change.

#### What is the Issue?

- Floating plastic debris are currently the most abundant items of marine litter.**
- Plastic has been detected on shorelines of all the continents, with more plastic materials found near popular tourist destinations and densely populated areas.
- The main sources of marine plastic are land-based, from urban and storm runoff, sewer overflows, inadequate waste disposal and management, industrial activities, construction and illegal dumping.
- Under the influence of solar UV radiation, wind, currents and other natural factors, plastic fragments into small particles, termed microplastics or nanoplastics.

#### Threat to Marine Environment

- Plastic pollution is the most widespread problem affecting the marine environment.
- Marine species ingest or are entangled by plastic debris, which causes severe injuries and deaths.
- Marine wildlife such as seabirds, whales, fishes and turtles, mistake plastic waste for prey, and most die of starvation as their stomachs are filled with plastic debris.

- Floating plastics also contribute to the spread of invasive marine organisms and bacteria, which disrupt ecosystems.

## Impacts on food and health

- Invisible plastic has been identified in tap water, salt and are present in all samples collected in the world's oceans, including the Arctic.
- Several chemicals used in the production of plastic materials are known to be carcinogenic and interfere with the body's endocrine system, causing developmental, reproductive, neurological, and immune disorders in both humans and wildlife.
- When marine organisms ingest plastic debris, these contaminants enter their digestive systems, and overtime accumulate in the food web.
- The transfer of contaminants between marine species and humans through consumption of seafood has been identified as a health hazard, but has not yet been adequately researched.

## Other Impacts

- If plastic waste is incinerated, it releases carbon dioxide into the atmosphere, thereby increasing carbon emissions.
- Plastic waste damages the aesthetic value of tourist destinations, leading to decreased tourism-related incomes.
- It leads to major economic costs related to the cleaning and maintenance of the sites.

## International Efforts

- Global concern and public awareness regarding the impact of plastic on the marine environment are currently increasing.
- **The United Nations Environment Program (UNEP) considers plastic marine debris and its ability to transport harmful substances as one of the main emerging issues affecting the environment.**
- At the 2015 G7 summit in Bavaria, Germany, the risks of microplastics were acknowledged in the Leaders' Declaration.
- **Legal efforts have been made at the international and national levels to address marine pollution.** The most important are
  - the 1972 Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (or the London Convention),
  - the 1996 Protocol to the London Convention (the London Protocol), and
  - the 1978 Protocol to the International Convention for the Prevention of Pollution from Ships (MARPOL).
- However, compliance with these laws is still poor, partly due to limited financial resources to enforce them.

## Way Forward

- There is an urgent need to explore the use of existing legally binding international agreements to address marine plastic pollution.
- **Recycling and reuse of plastic materials** are the most effective actions available to reduce the environmental impacts of open landfills and open-air burning.
- Support for **research and innovation to develop new products to replace single-use plastics** are also necessary to prevent and reduce plastic pollution.
- Sufficient litter and recycling bins can be placed in cities, and on beaches in coastal areas.
- Governments, research institutions and industries also need to work collaboratively **redesigning products in order to reduce microplastics waste** from pellets, synthetic textiles and tyres.
- This will **require solutions which go beyond waste management, to consider the whole lifecycle of plastic products, from product design to infrastructure and household use.**