

Pollution of river Ganga by microplastics

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In news- According to a new study, microplastics concentration in Ganga is higher than any other major world river. The study is based on an analysis of the stretches of the river Ganga by Delhi-based environment NGO Toxics Link.

Key findings of the study-

- It has revealed that the **highest concentration of such plastic was found at Varanasi**, comprising single-use and secondary plastic products.
- The water testing was carried out in collaboration with the **National Institute of Oceanography (NIO) in Goa**.
- The results show the presence of at least 40 different kinds of polymers as microplastics.
- The shapes and nature of the observed resins ranged from fibres to fragments, films and beads, with fragments being the predominant shape in all locations.
- Microbeads were observed in Varanasi and Kanpur, while no beads were found in Haridwar.
- The **most frequent size range observed in all the samples was <300µm**.
- Microplastics entered the Ganga through **industrial waste or packaging of religious offerings, tanneries**.
- The density of population in the three cities also added to the problem because a large chunk of pollutants got directly discharged into the river by people living on the banks.
- Varanasi showed the maximum load of microplastics in the water of the Ganga, as compared to the other two cities.
- **Assi Ghat in Varanasi had the maximum abundance** of microplastics.
- The Dohri ghat in Kanpur ranked top most among all 15

sites (five each from all three cities) from where the river water sample was collected.

Types of microplastics present in Ganga-

- The study also did an analysis of the types of microplastics present in the Ganga.
- **Ethylene Vinyl** is particularly suited for food, drugs and cosmetic packaging.
- **Polyacetylene** is used as a doping agent in the electronics industry.
- **Polypropylene** is also used in packaging, plastic sheets, fibre, fabrics, rope, etc.
- **PIP** is mainly used in footwear and baby bottles.
- **Polyamide**, commonly known as nylon, is used as a natural fibre and as metal wires in clothing and industry.
- All these and 36 other types were found in the samples.

Study recommended the strengthening of implementation of **Extended Producer Responsibility (EPR)** in Plastic Waste Management Rules since a lot of pollution in the Ganga was due to industrial waste.

What are microplastics?

- Microplastics are plastics that are **synthetic solid particles sized ranging 1 micrometre (μm) to 5 millimetre (mm), which are insoluble in water.**
- Microbeads are tiny pieces of polyethylene plastic added to health and beauty products, such as some cleansers and toothpastes.
- Untreated sewage from many cities along the river's course, industrial waste and religious offerings wrapped in non-degradable plastics pile pollutants into the river.
- The plastic products and waste materials released or dumped in the river break down and are eventually broken down into microparticles.

- Previous studies say that over 663 marine species are affected adversely due to marine debris and 11% of them are said to be related to microplastic ingestion alone.
- Not only are these microplastics toxic themselves, they also have a tendency to absorb various toxins present in water, including harmful chemicals.

The National Institute of Oceanography (NIO)

- NIO has its **headquarters at Dona Paula, Goa**, and regional centres at Kochi, Mumbai and Visakhapatnam.
- **It is one of the 37 constituent laboratories of the Council of Scientific & Industrial Research (CSIR)**, New Delhi.
- **CSIR-NIO was established on 1 January 1966** following the International Indian Ocean Expedition (IIOE) in the 1960s.
- **The principal focus of research** has been on observing and understanding special oceanographic characteristics of the Indian Ocean.