

# 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 ( $\mu\text{m}$ ) 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.