Microfiber

A microfiber is tiny fragment of the type of plastic used to make synthetic fabrics.

These fibers are shed from synthetic clothing during a washing machine cycle.

Because they are so small, microfibers aren't all caught by wastewater treatment plants; instead, many are released into the environment.

How bad is the problem?

Microfibers are emerging pollutants with widespread distribution in the environment and have adverse ecological impacts.

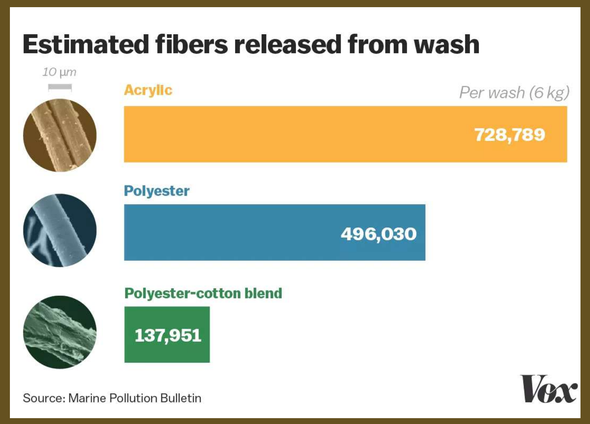
Approximately 2 million tonnes of microfibers are released into the ocean every year from various sources, of which 700,000 micro fleeces are released from each garment through domestic laundry.

Microfibers are the major marine pollutant throughout the world estimating 13 million tonnes of coastal synthetic fabric waste entering the ocean each year, out of which 2.5 million tonnes enter through adjoining rivers.

It is anticipated that, to date, 1.5 million trillion of microfibers are present in the ocean. Microfibers are mistakenly ingested by marine animals and cause hazardous effects to aquatic species.

Microfiber treatment techniques are under progress for efficient control of this pollutant.

More than ever, our clothes are made of plastic. Just washing them can pollute the oceans!.



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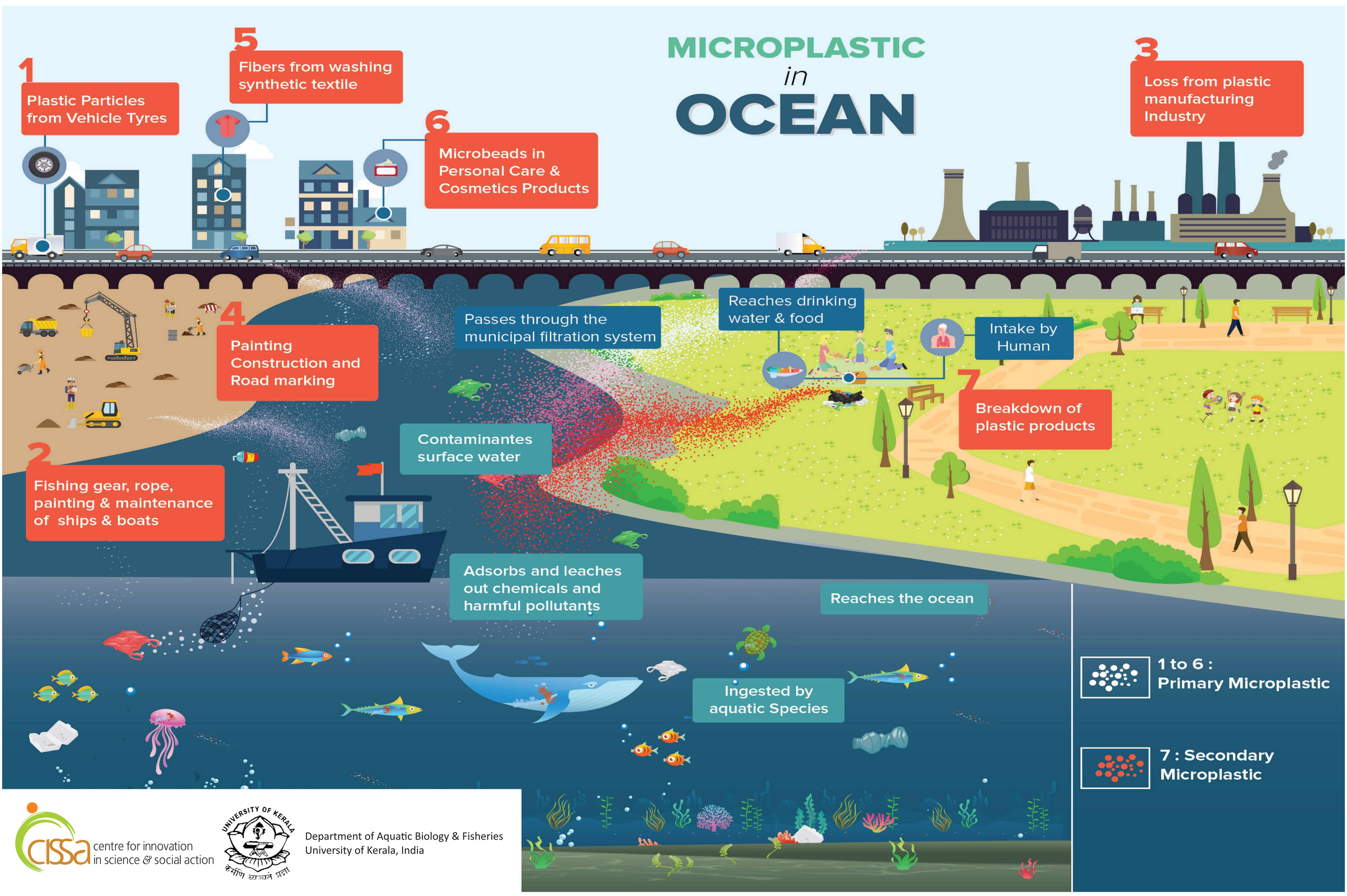
MICROPLASTIC *in* OCEAN



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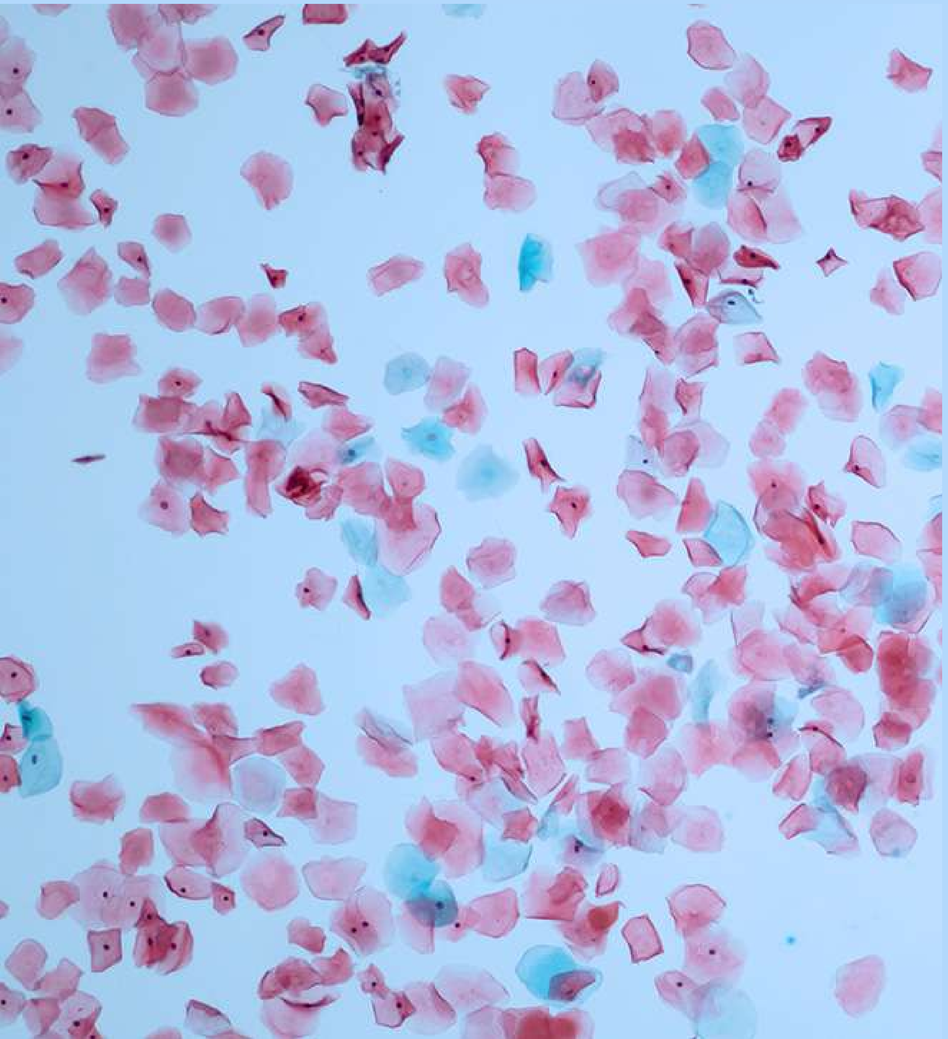
Health issues of Microplastics



“ Concerns have been raised relating to whether the small size of the plastics may theoretically penetrate the gut and distribute in body,” adds the spokesperson. All of this has prompted the WHO

Microplastics are just beginning to make a noise in the Indian medical fraternity. “The IMA (Indian Medical Association) has not done any study on this, but we are consumed by the idea of it being a health hazard,” says IMA honorary finance secretary VK Monga. “We don’t know the magnitude of the microplastic in our body or the health hazard it can pose. Hypothetically, it can harm the intestinal lining, it can attack the useful bacteria in the body, it can harm the cardiac, neurological and hormonal systems,”

NETWORK to PROTECT the OCEAN

Suchitwa Sagaram or Clean Sea project

The fisheries department of Kerala, in association with the Fishing Boat Operators Association has launched an innovative sanitation programme called Suchitwa Sagaram or Clean Sea project involving fishermen to collect the plastic and bringing it back to shore.

Once brought from the sea, the plastic material is collected at the fishing harbour. As fish trawlers lay their nets in the sea, they end up scooping out huge amounts of plastic that get entangled in the nets along with the fish.

In the past, they would simply release the plastic junk back into the water, but now the fishermen – who have received training through the Suchitwa Sagaram initiative – are bringing that plastic back to shore.

The plastic is then cleaned with the help of women in the Kudumbasree units and the waste is fed into a plastic shredding machine, which turns it into material that is then used for road surfacing.

We need the joined action by the government, civil society ogranisations, coastal communities and citizen scientists to keep the ocean clean and make the people aware of the importance of the ocean, for now and for the future generation.

Ghost nets
Silent killers in the oceans

Abandoned, lost, or otherwise discarded fishing gear (ALDFG) is one of the most dangerous types of marine debris.

These are often called “ghost nets” as they silently kill thousands of marine organisms every day, as they get entangled in these free moving nets.

Every year they are responsible for trapping and killing millions of marine animals including sharks, rays, bony fish, turtles, dolphins, whales, crustaceans, and birds.

Ghost nets cause further damage by entangling live coral, smothering reefs and introducing parasites and invasive species into reef environments.

In addition, ghost nets affect the sustainability of well-managed fisheries by damaging boats and killing species with economic value. They also impact the beauty of shorelines, resulting in expensive cleanup costs and financial loss for the tourism and diving industry.

A drifting ghost net might eventually become so heavy due to its catch that it sinks to the bottom of the ocean. On the seabed, smaller ocean dwellers start feeding on the entangled marine animals, which, along with natural decomposition, reduces the weight of the net to the extent that it floats back up to the surface. Once the ghost net is again drifting with the ocean currents, it starts its cycle of ghost fishing, sinking and floating back up all over again. Due to the durability of modern fishing nets, this circle of devastation can continue for decades.

Why microplastics is an issue?

Microplastics undergo various processes of physical, enzymatic and microbial degradation in nature, but do not get completely broken down.

Omnipresent! Though it goes unnoticed and often remain microscopic, their presence is detected in tap water, bottled water and salt that we consume every day!

Microplastics can absorb extremely harmful hydrophobic organic pollutants.

Removal of microplastics from aquatic environment is extremely difficult as that could lead to the elimination of smaller microscopic organisms from the sea which are key in the food web and ecology of the oceans.

Microplastics exist in air as airborne pollutants originating from the plastic textile fiber production.

They may get into the body of even smaller organisms and may reach humans through food chain and at each trophic (feeding) level, their quantity in the body of organism increase (bioaccumulation).

IMPACTS

Pollution of the environment and accumulation of pollutants. Microplastics may carry microbial pathogens or adsorb chemical contaminants. The microplastics themselves may be manufactured with toxic additives.

The toxins, including endocrine disrupting chemicals (EDCs), persistent organic pollutants (POPs), organochlorine pesticides, carried by these microscopic plastic particles are carried over long distances by water systems and released inside the organisms, impacting further.

Easy ingestion by microscopic organisms in water and further entry into food chain and food web.

Humans can be exposed to microplastics either directly through contaminated water and cosmetics or indirectly from seafood consumption. It can lead to bacterial infections in the gum, skin or injure the cornea by sticking in the eye.

The consumption of plastics and microplastics by marine animals can lead to false satiation , starvation and death.

Marine Plastic Pollution in India

India and the rest of South Asia are the worst culprits for microplastic pollution, releasing 274 kilo tonnes of primary microplastics into the oceans, says the International Union for Conservation of Nature in its study Primary Microplastics in the Oceans: a Global Evaluation of Sources.

The seas near Kerala, Mumbai, Chennai and the Andaman and Nicobar Islands are among the worst polluted in the world. IT is a grossly neglected and researched issue in India.

A study from the Centre for Environmental Science and Engineering in Indian Institute of Technology (IIT) Bombay establishes that Indian sea salts are contaminated with microplastics.

According a study done in MG University under Prof EV Ramasamy, microplastics were found in all sediment samples of Vembanad Lake; on an average, 266 microplastic particles in every square metre.

In Daman & Diu, plastic particles were found in the stomach of a Longman's Beaked Whale. The analysis of sediment samples from a remote coral island in the Indian Ocean indicates presence of macro, meso and microplastics.

CMFRI's scientists have recovered plastic from the gut of dozens of species: mackerel near Mangalore, yellowfish tuna near Kochi and anchovies off the coast of Alappuzha, among them.

The stake net fishery of Panambukad, Vemband Lake, Kerala shows that the average catch including the marine debris ranged from 1.04 to 2.04 kg net-1 day-1 with an average of 1.34 kg net-1 day-1. The percentage of marine debris in the stake nets ranged from 42.68 to 73.4%. Plastic items formed 97% by weight and 99% by number of the total marine litter (Shylaja et al., 2018; CMFRI)

Beach litter from different maritime States and the UTs showed that Odisha coast has the lowest (0.31 g/m2) quantity and Goa coast (205.75 g/m2) the highest quantity of beach debris. Archipelagic coasts of Andamans as well as Lakshadweep recorded values higher than Kerala, Tamil Nadu, Andhra Pradesh, Odisha and West Bengal (Kaladharan et al., 2018; CMFRI)

A study covering 2,000 sq m of Menamkulam beach in the capital, as part of a national workshop on Experiential Learning with Indian Educators on Marine Debris and its Management, has found that plastics formed 89% of the 6,321 pieces of debris. Plastic collected at the beachside had 36% Styrofoam and 32% film plastic.

Studies by Thanal in Thiruvananthapuram shows that the average plastic litter index for the Kerala coast is 1.66 number of plastic pieces per sq m and 10.31 gm of plastic litter per sq m. Plastic litter along the Kerala coast has been quantified at 17,00,32,429 pieces, weighing 1,057.45 tonnes as per the study carried out in 59 sites in the coast at regular intervals of 10 km in the nine districts. Snacks are the major contributor to the plastic waste and the number of carry bags comes to estimated at 85.54 lakh.