

The focus of Environmental Information, Awareness, Capacity Building & Livelihood Programme (EIACP) scheme is to disseminate environmental information to decision makers, policy planners, scientists and researchers across the world.

CERC-EIACP, Programme Centre - Resource Partner to MoEF&CC works on the thematic mandate of 'Environment Literacy- Eco-labelling & Eco-friendly Products'. This bi-monthly e-bulletin features latest of Environment, developments and innovations.

Covalent Triazene Framework (CTF)

Plastic pollution is increasingly problematic due to its recognized harmful impact, particularly with the emergence of micro plastics, a newer issue whose detrimental effects are now being comprehended. Korean researchers have developed a promising remedy called covalent triazene framework (CTF), a highly porous material with significant surface area. This innovation has the capability to capture and retain molecules, reportedly eliminating more than 99.9% of micro plastics in just 10 seconds. It holds promise as a versatile and cost-effective technology that could be widely implemented. However, completely eliminating micro plastics remains a significant challenge, especially as society has yet to transition away from larger plastic usage. Nonetheless, these advancements offer a glimmer of hope in addressing this intricate environmental problem.

Source: <https://newatlas.com/environment/high-efficiency-water-filter-99-9-microplastics-10-seconds/>

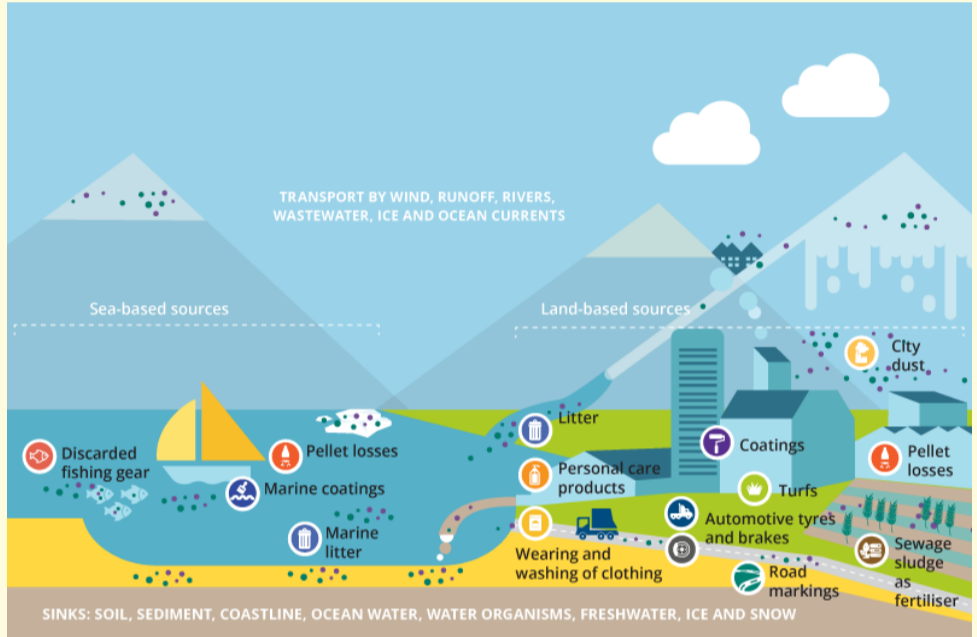
Micro-plastics

Green Issue

In our Green Alert Vol.10 issue 3, we delved into various kinds of plastic and the predicament of plastic pollution. Expanding on that discussion, our focus now shifts to comprehending the fate of plastic once it's disposed of in our trash bins, ultimately reaching landfills or potentially even oceans.

Plastics fragment into micro plastics, smaller particles below 5mm in size. Micro plastics come from various sources. Some are deliberately manufactured for products like exfoliating scrubs, cosmetics, and industrial abrasives. Others are a product of breakdown or fragmentation of discarded plastic items due to exposure to sunlight, wind, rain.

Recent research highlights their extensive presence across environments like air, deep oceans, mountain peaks. This pervasive distribution signifies their near universal prevalence. Furthermore, they create environments conducive to high concentrations of bacteria, surpassing those found in an equivalent volume of water. When micro plastics come into contact with water, especially in aquatic environments, they create a surface for microorganisms like bacteria to attach and grow. These microorganisms form a thin layer called a bio-film on the surface of the micro plastics. Micro plastics also have a tendency to attract and amass contaminants such as chemicals and fertilizers already existing in the water.



Source: Illustration by the Collaborating Centre on Sustainable Consumption and Production (CSCP) for the European Topic Centre on Circular Economy and Resource Use (ETC/CE) and the EEA <https://www.eea.europa.eu/publications/microplastics-from-textiles-towards-a>

Aquatic environment bear the brunt of this crisis, with marine life ingesting these particles, mistaking them for food. Numerous studies have unveiled compelling evidence regarding the accumulation of micro plastics in diverse marine organisms, including shrimps, fishes, and even pelagic birds. As these smaller organisms are consumed by larger predators, the accumulated micro plastics within their bodies become more concentrated due to bio-magnification. The process continues as larger predators consume smaller ones, resulting in an increased concentration of micro plastics in organisms higher up the food chain.

Notably, many of these creatures constitute a significant portion of the diet for millions of people. Micro plastic particles have been observed in the tissues or digestive systems of fish found in locations such as Tuticorin, Port Blair, and Chennai. Additionally, corals in the Gulf of Mannar have been observed carrying these particles within their bodies, while crabs along the Jakhau, Okha, and Veraval coasts of Gujarat, as well as mussels and clams in Pondicherry, have also been found to harbor micro plastics.

Given the evidence gathered from the Eastern, Western, and Southern coastlines of India, it is reasonable to speculate that the majority, if not all, of marine animals likely contain micro plastic particles within their bodies. Corals, recognized as crucial habitats for a myriad of marine animal species, often referred to as the "rainforests of the sea," are also amassing micro plastic particles. This accumulation poses a threat to coral reefs, potentially leading to the deterioration of one of the planet's most bio diverse ecosystems. Such degradation could profoundly impact the survival of species reliant on corals, either directly or indirectly.

This issue requires careful consideration due to the emerging impact of plastics on human health. A collaborative effort between research teams from the Netherlands and America investigated the effects of micro plastics on the health of the placenta, amniotic fluid, and the developing fetus. Their findings revealed a slight impact on the gene responsible for hormone production and metabolism in the placenta. Similarly, another study conducted by researchers from the Netherlands and the UK highlighted the adverse effects of chemicals released from micro plastics on lung health. Additionally, a separate research team from the Netherlands and France examined the impact of micro and nano plastics on the brain, observing their ability to traverse the blood-brain barrier and access the brain.

Currently, there appears to be no definitive solution to completely eliminate micro plastic pollution because consumers continue to face challenges in halting the use of single-use plastics. To address micro plastic pollution, our initial focus should be on acting responsibly and prudently in our plastic usage. This approach could, at the very least, help reduce the release of micro plastics into the environment. Resolving the issue of plastic pollution requires a joint effort from both consumers and the governments across the world.

Plastics, recognized as enduring environmental pollutants, share the same persistence with micro plastic particles. These minute particles take anywhere from 100 to 1000 years to degrade completely. Will you be putting a cut on your plastic usage?

Use plastic wisely if strictly needed. Otherwise go for the alternatives like Cotton bags, Jute bags and others.



Sources:
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Eco-Tips

Let's work together to address the impending challenge posed by micro plastic pollution.

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