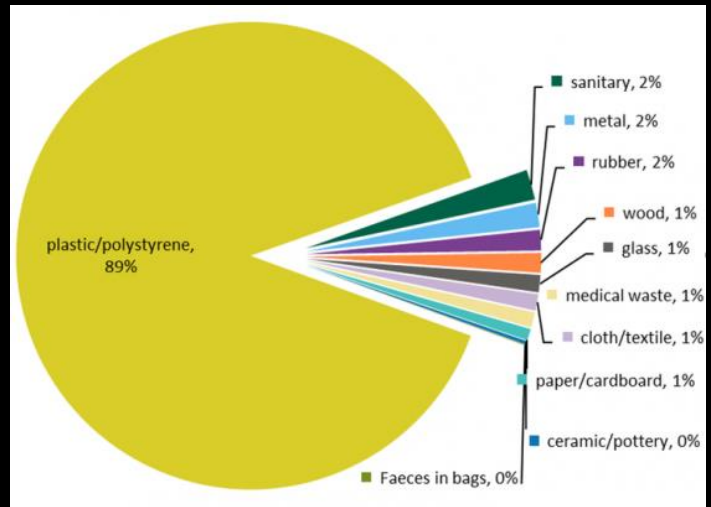


Marine Debris and Microplastics

A study on the source of marine debris had exposed that plastic materials are the most common debris making up to 89.9 % (<https://www.ospar.org>) and the term 'Microplastics' which was introduced in the mid-2000s refers to plastic particles that are smaller than 5.0 mm in size (UN Environment Programme, 2021

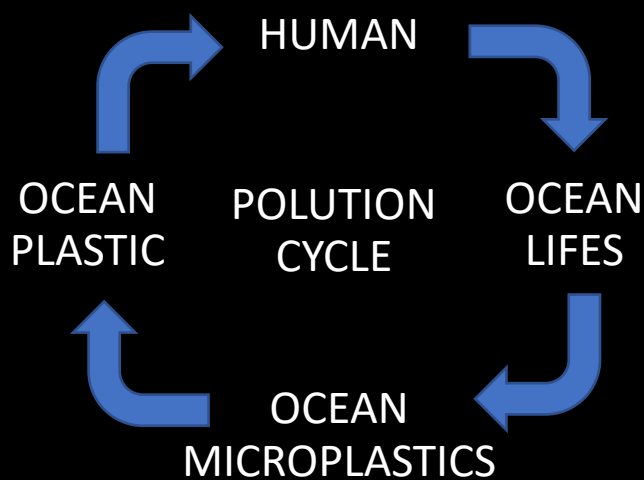


Source: eia-international.org

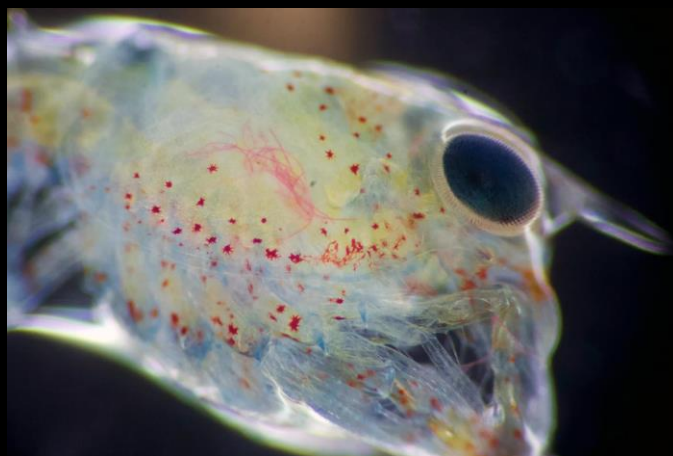
Marine debris and Microplastics are one of the most serious global issues due to its durability that could persist for years. The physical effects of plastic debris have been clearly demonstrated in marine organisms, like for example, incidence of entanglement, suffocation, and disruption of digestion in birds, fishes, mammals, turtles, and the like.

Abreo *et al.* (2016) reported the first evidence in the Philippines of plastic ingestion by the beaked whale *Mesoplodon hotaula* and confirmed the susceptibility of cetaceans to plastic ingestion. In Thailand, the number of deaths among marine endangered species in 2016 due to consuming fishing gear and plastic-based wastes was 355 and over 95 % of these are turtles and dolphins (Thaitrakulpanich, 2016). Additionally, marine debris can affect the ecosystems and biodiversity by acting as transport for invasive species or smothering benthic fauna (Todd *et al.*, 2010).

While microplastics can enter the systems of marine organisms and humans through ingestion and inhalation, they could cause adverse impacts as these are sources of toxic chemicals such as phenanthrene, mercury, cadmium, and PCBs that are persistent organic pollutants (POPs). Yong *et al.* (2020) compiled recent findings related to the potential toxicity and detrimental effects of micro- and nanoplastics (NPs), and established that ingesting microplastics/NPs could result in behavioral abnormalities in fish in terms of feeding, and movements of adults and larvae as well as reproduction in adults, and also occurrence of changes in blood cells, brain appearance, metabolites, key metabolic enzymes, and oxidative stress induced enzymes



Categorization of microplastic particles by shape
Source: Campanale *et al.* (2019)



Source: <https://www.eurekalert.org/>

Even though the long-term consequences of the accumulation of microplastics in mammals and humans are yet unclear (Yong *et al.*, 2020) but several fishery consumers are concerned that microplastics could be harmful to the consumers as these could be source of toxic poisoning. Therefore, based on food safety concerns, the contamination of microplastics in fish and fishery products could impede the sustainable development of fisheries as an important economic sector of the Southeast Asian region.

Mitigation of Debris Pollution by Fisheries Sector in Southeast Asia

The fisheries sector occupies high proportion of the marine areas. This sector could be impacted by the direct dumping. Therefore, contribution from them would form key success to combat pollution, particularly from the fishers. Many programs which fisheries communities can contribute to combating marine debris and microplastics pollution have been initiated in Southeast Asian countries. Some examples of such programs are as follows:

- Studies on abandoned, lost or otherwise discarded fishing gear (ALDFG)
- Conservative campaign on marine debris by encouraging volunteer fishers to keep all wastes produced in fishing vessels, garbage or damaged fishing gears to bring to shore, in order to prevent and mitigate direct dumping of marine debris
- Encouraging aquaculture facilities to bag their garbage and dispose them properly on land
- Setting up of a pilot fishery community to come up with useful products like building materials from plastic wastes available in the community
- Building up or improving capacity of fishery communities to be able to easily manage wastes

