



Plastic Pollution: A View on Emerging Issues

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INTRODUCTION

Plastic pollution is defined as the buildup of plastic objects and particles (for example, plastic bottles, bags and microbeads) in the Earth's ecosystem, which has a negative impact on humans, wildlife and their habitat. Plastics that pollute the environment are classified as micro, meso or macro debris. Because plastics are economical and durable, they are particularly flexible for various uses; as a result, producers prefer plastic over other materials. However, the chemical makeup of most plastics makes them resistant to many natural breakdown processes, making them slow to disintegrate. These two elements, when combined, allow vast amounts of plastic to enter the environment as unmanaged garbage, which remains in the ecosystem and travels through food webs.

DESCRIPTION

Plastic pollution can harm land, streams and the oceans. Each year, between 1.1 and 8.8 million tonnes of plastic garbage are projected to enter the ocean from coastal areas. It is predicted that there is a stock of 86 million tonnes of plastic marine trash in the global ocean as of the end of 2013, assuming that 1.4% of global plastics generated between 1950 and 2013 entered and collected in the ocean. Some academics believe that by 2050, there may be more plastic in the oceans than fish. Living organisms, particularly marine animals, can be injured by mechanical impacts such as entanglement in plastic objects, issues associated with plastic garbage ingestion or exposure to chemicals within plastics that interfere with their physiology. Degraded plastic garbage can have an immediate impact on humans by direct consumption (e.g., in tap water), indirect consumption (eating plants and animals) and disturbance of numerous hormonal processes.

As of 2019, 368 million tonnes of plastic are manufactured each year, with China producing 51% of the total. From the 1950s to 2018, an estimated 6.3 billion tonnes of plastic were manufactured worldwide, with an estimated 9% recycled and the other 12% burnt. This vast volume of plastic garbage permeates the environment and causes difficulties throughout the ecosystem; for example, studies show that 90% of seabirds have plastic debris in their bodies. Significant efforts have been made in some places to reduce the prevalence of free range plastic pollution by lowering plastic consumption, cleaning up trash and promoting plastic recycling.

By 2020, the worldwide mass of created plastic will have surpassed the biomass of all land and sea creatures combined. A May 2019 modification to the basel convention restricts the exporting and importation of plastic trash, with the goal of preventing plastic garbage from being shipped from developed countries to developing countries. This agreement has been signed by nearly all countries. On March 2, 2022, in Nairobi, 175 countries promised to negotiate a legally enforceable pact to stop plastic pollution by the end of 2024.

Because of increasing demand for protective equipment and packaging materials during the COVID-19 pandemic, the amount of plastic garbage produced increased. More plastic ended up in the ocean, particularly plastic from medical waste and masks. Several news stories indicate that the plastic industry is attempting to promote single use plastic production by capitalizing on health concerns and consumer demand for disposable masks and packaging.

Causes

- Timeline of plastic development
- The pathway by which plastics enters the world's oceans

Estimates of how much plastic waste has been produced during the last century vary. One billion tonnes of plastic waste has been dumped, according to one estimate, since the 1950s. Others claim that humans have produced 8.3 billion tonnes of plastic, of which 6.3 billion tonnes are rubbish and only 9% is recycled.

This trash is expected to include 81% polymer resin, 13% polymer fibers and 32% additives. More than 343 million tonnes of plastic garbage were generated in 2018, with post-consumer plastic waste (industrial, agricultural, commercial and municipal plastic waste) accounting for 90% of the total. The remainder was pre consumer waste from resin production and plastic product manufacturing (for example, materials rejected owing to undesirable color, hardness or processing characteristics).

Plastic packaging accounts for a sizable amount of post-consumer plastic trash. Plastic packaging is expected to account for 5% of MSW in the United States. Plastic bottles, pots, tubs and trays, plastic films, shopping bags, trash bags, bubble wrap, plastic or stretch wrap and plastic foams, such as Expanded Polystyrene (EPS), are examples of this packaging. Agriculture (e.g. irrigation pipes, greenhouse covers, fencing, pellets, mulch); construction (e.g. pipes, paints, flooring and roofing, insulants and sealants); transportation (e.g., abraded tyres, road surfaces and road markings); electronic and electric equipment (e-waste); and pharmaceuticals and healthcare

are all sources of plastic waste. The entire amount of plastic garbage produced by these industries is unknown.

Several studies have attempted to quantify plastic leakage into the environment at both the national and global levels, highlighting the difficulties in pinpointing the sources and quantities of all plastic leakage. According to one global survey, between 60 and 99 million tonnes of mismanaged plastic garbage were produced in 2015. 19-23 million tonnes of plastic garbage entered aquatic habitats in 2016. In the same year, the Pew Charitable Trusts and Systemic (2020) calculated that 9-14 million tonnes of plastic garbage ended up in the oceans.

CONCLUSION

Despite global efforts to limit plastic trash output, environmental losses are expected to rise. Without large interventions, modelling suggests that between 23 and 37 million tonnes of plastic garbage per year might enter the oceans by 2040 and between 155 and 265 million tonnes per year could be released into the environment by 2060. Under a business-as-usual scenario, such increases would most likely be attributed to a continuing rise in plastic product production, driven by consumer demand and insufficient waste management improvements. Because plastic trash already has a substantial influence on ecosystems, a rise of this scale might have devastating implications.