

# **Adverse Effects of Plastic Pollution on Environment**

**Dr. Vandana Rathore**

Department of Zoology  
Government Degree College, Bilaspur Rampur UP

## **Abstract:**

Various factories manufacture numerous amounts of plastic bags that people use appropriately in carrying their shopping due to their affordability and ease of use, although no consideration is placed on the harmful effects of such materials, or, in some cases, discussed seriously. The following essay focuses on how sustainable building material will reduce environmental degradation and create healthy buildings that could be sustainable to both occupants and the surrounding environment. Plastics have become an essential component in our daily lives and play a significant role in the current practices. Plastic material causes severe environmental destruction by polluting lands and seas. The introduction of guidelines for manufacturing and usage of plastics would assist in minimizing the negative impacts in our environment and health. It is clear that plastics provide many social benefits and have potential advancements in technology and medicine. Although issues regarding usage and disposal are varied, they may include waste buildup in landfills and in natural ecosystems, physical hazards for animals due to ingestion and entrapment by plastics, contamination by chemicals that may leach from plastics materials, and possible transport of chemicals in plastics to wildlife and humans.

**Keywords:** Environment, Plastic, Pollution, Effects, waste management.

## **Introduction**

Plastic has become a universal problem. On average, 24 million tons of plastic waste gets dumped annually into the world's aquatic ecosystems, which contaminate lakes, rivers, and oceans. Plastic changes the habitat and its natural processes by reducing the ecosystem's adaptation ability to climate changes, thereby affecting the livelihoods, agricultural productivity capabilities, and social welfare of millions of people. Plastics are relatively cheap, light, tough, and flexible substances resistant to corrosion, with high levels of thermal and electrical insulation. Diversity in types of polymer along with flexibility in terms of properties allows manufacturing a huge variety of items bringing numerous benefits including medical and technological innovations, energy savings, and others ( Andrady & Neal, 2009). Plastic has become an essential component of our everyday life. We start our day using plastic cups and buckets for bathing. In addition, while considering our actions in detail throughout the whole day, we utilize plastic in the form of water bottles, combs, food packing, milk packs, straws, disposable cutlery, shopping bags, gift wrap, toys, and much more. Such extensive usage has produced considerable quantities of waste.

Plastic has been so extensively used that plastic pollution has emerged as one of the environmental issues plaguing our planet. It has affected our environment, our health and well-being. This issue has been caused by us all, and it becomes our duty to act in its solution to help reduce and eventually eliminate Plastic Pollution. This would be a world without moth and rust and rich in color; a world made of artificial substances from the most widely available materials, a world in which nations are increasingly less dependent on their local natural resources, and in which man creates his requirements through magical manipulation of whatever is at his disposal (Yarsley & Couzens, 1945). It is reported that there have been instances where contamination of soil due to accidental deposition of plastic particles in soil due to the application of sewage sludge(Zubris & Richards; 2005). There have been reports of contamination of

plastics and glasses in the preparation of compost from municipal solid waste(Brinton; 2005). There are reports of plastic transport by rainwater and floods(Thompson et.al.2005).

### **Scale and Distribution of Marine Plastic Pollution**

The amount of plastic waste in the ocean is hard to understand because it builds up in patterns the show how plastic is made and used around the world and how complicated ocean transportation systems are. A trash patch called the Great Pacific trash Patch is thought to cover 1.6 million square kilometers, which is twice the size of Texas (Green Match, 2021). There is a pollution problem in all of the world's seas, and this huge accumulation zone is just the most obvious sign of it. There are similar, but smaller, accumulation zones in all of the major ocean areas.

Plastic waste in the ocean moves around in patterns that are set by ocean currents, wind systems, and the physical qualities of the different types of plastic. Garbage patches are made when surface currents gather floating trash in certain areas. Deeper currents move plastic particles through the water column and finally to the sediments on the seabed. Plastic buildup over time shows worrying patterns, with levels rising in most marine areas despite more people knowing about the problem and some attempts to reduce it. New plastic trash keeps coming in, and old trash keeps sticking around, so the amount of plastic pollution in the ocean keeps growing.

Plastic pollution levels vary across regions based on their proximity to population areas, industry activities, and the quality of their waste handling systems. The most plastic trash is usually found in coastal seas close to big cities and industry hubs. The pollution level usually goes down as you move further away from the shore. But because ocean currents can carry trash over long distances, even faraway marine places are polluted with a lot of plastic. Once thought to be clean, the Arctic seas now have plastic trash that was brought there from lower regions. This shows that marine plastic pollution affects the whole world.

The fact that plastic pollution is spread out vertically in the water column shows that marine pollution is three-dimensional. Most of the attention is on the drifting trash at the ocean's top, but plastic particles can be found all the way down to the very bottom of the ocean. Microplastics have been found in layers deep in the ocean all over the world. This shows that plastic pollution has reached even the most remote marine habitats. This vertical spread makes conditions for marine life at all depths, from seabirds that eat at the top to benthic communities that live deep in the ocean.

Changes in weather trends, changes in the flow of the ocean, and human actions all have an effect on where and how much plastic pollution is there. Plastic trash from the coast can be moved around by storms and spread out in marine systems. Changing current patterns with the seasons can also change where trash builds up. Long-term studies show that plastic pollution is usually getting worse, though the rate of improvement varies by region and relies on how waste is handled and what policies are in place.

### **Chemical Pollution and Toxic Effects**

A complex mixture of harmful compounds is introduced into marine habitats by marine plastic pollution, which is a problem that goes beyond physical contamination. Many chemical additives are added to plastic materials throughout the production process to improve qualities including color, flexibility, flame resistance, and UV stability. These chemicals, which include colorants, plasticizers, flame retardants, and antioxidants, can either directly enter marine life through touch or ingestion, or they can seep into saltwater from plastic waste. The initial use, age and history of environmental exposure of the plastic waste. The additive packages found in consumer plastics may differ from those found in industrial or specific applications, resulting in a varied chemical signature in plastic pollution. Plastic materials chemical characteristics may change as a result of weathering and deterioration in plastic pollution. This might increase the bioavailability of embedded additives or lead to the formation of new harmful chemicals.

The initial use, age and history of environmental exposure of the materials all have a substantial impact on the chemical makeup of marine plastic waste. The additive packages found in consumer plastics may differ from those found in industrial or marine-specific applications, resulting in a varied chemical

signature in marine plastic pollution. Plastic materials chemical characteristics may change as a result of weathering and deterioration in marine settings. This might increase the bioavailability of embedded additives or lead to the formation of new harmful chemicals.

**Polyethylene terephthalate plastic-** This plastic is one of the most widely utilized. It is used in various items, from water bottles and product containers to baby wipes, clothing, bedding and mattresses. For instance, in Western Europe, the consumption of polyethylene terephthalate plastics is 38 million tons per year, primarily utilized to produce plastic packaging, household and household products, electrical and electronic items (Hannequart, 2004).

**Polypropylene-** Polypropylene ( pp) has the lowest density among standard plastics, PP has excellent chemical resistance and can be processed through many processing methods such as injection molding and extrusion. Polypropylene is a polymer produced catalytically from propylene. The great advantage is its resistance to high temperatures, which makes it especially suitable for objects such as bowls ,funnels ,buckets, bottles, ballons and instrumental glasses that must be sterilized (clean) frequently for use in clinical settings. Propylene molecules polymerize into very long polymer molecules or chains.

**Polystyrene-** Polystyrene (PS) consists of styrene monomers obtained from liquid petrochemical products. It consists of a long chain of hydrocarbons with phenyl groups attached to alternate carbons atoms. Currently, most polystyrene waste is disposed of in landfills and is not recycled due to problems encountered in the separation and purification of polystyrene. As a hard, solid plastic, it is often used in products that require clarity, such as food packaging and laboratory items. In combination with various dyes, additives or other plastics, polystyrene makes home appliances, electronics, auto parts, toys, flower pots, garden tools and more.

**Polyvinyl Chloride (PVC)-** Polyvinyl chloride, a heat-resistant plastic, is used for packaging fruit juice and edible oil, among other products. Polyvinyl Chloride is described as highly hazardous since it has components that include heavy metals, dioxins, and phthalates. Plastic bags containing phthalates are flexible because of the presence of phthalates in the bag. PVC has been linked to causing conditions such as chronic bronchitis, congenital disorders, genetic mutation, cancer, skin diseases, energy generation, fishing and aquaculture (Sivan, 2011). There are economic impacts in the form of reduced tourism revenues, impact on tourist-related activities, and damage to the marine environment. Plastic bags not only threaten the existence of marine organisms but also agricultural land. Disposing of plastic bags in farmland affects crop production in such farms. They are responsible for dilapidation of the air and agricultural land, which has, by accident, resulted in depletion of natural resources like oil (Matagi,2002).

## **Conclusion**

Among the most ubiquitous and complicated environmental problems that exist today is the issue of plastic pollution, which impacts all the components of the ecosystems and threatens the very foundations of the survival mechanisms. Evidence suggests that the problem of plastic pollution is indeed one that poses a threat not only to marine diversity but to the proper functioning of ecosystems as well. In light of the environmental permanence of plastics, the benefits of any prevention measure may not become clear immediately, whereas the effects of inaction might accumulate. For this reason, the fight against plastic pollution will require dedication spanning several decades. Sustained efforts will require the formation of monitoring systems, which will enable tracking trends and adjusting plans accordingly. Studies related to the production of plastics worldwide and the ensuing environmental pollution problems show that plastic pollution is an enormous environmental problem. The impacts of plastic wastes on marine animals, humans, and the environment in general are not a matter of public interest and demand action that is needed for saving the ecosystem and its living creatures. Despite being quite effective in everyday

activities, the toxic substances utilized in plastic production should be under strict control in order to avoid any harm to the environment and people's health. The minimization of the community's contact with toxins found in plastic waste leads to a better chance of having a healthier environment and society. Thus, the state should have strong measures to enforce environmental legislation aimed at evaluating plastic production, utilization, and disposal processes.

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