



## Plastic Pollution Threatens Biodiversity and Human Health

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The degradation of diverse ecosystems worldwide by man-made plastic has become a serious problem. Chemicals released from plastic and nano plastic waste can cause physiological changes in organisms and various chronic diseases including cancer. Every nation and ecosystem in the globe is plagued by plastic pollution, including the poles, the deep-sea floor, and Mount Everest's top. Every year, the world's ecosystem receive 51% of this trash. In Bangladesh, daily plastic garbage production is 80,000 tons, with 36% of that material being recycled, 39 percent being landfilled, and the remaining 25 percent being directly added to the environment as pollutants. Timely legislation, rigorous adherence to the law, and raising public knowledge about the negative effects of plastic pollution and what can be done about it are all necessary to prevent plastic pollution.

Alexander Parkes discovered the first man-made plastic called parkesine in 1855 by reacting plant cellulose with nitric acid. Then in 1907, Leo Baekeland invented a fully synthetic plastic called Bakelite. The term "plastic" was first used by him. Nylon was a commercially successful synthetic thermoplastic polymer invented by DuPont Corporation. As plastic is cheaper, user-friendly and long-lasting than any chemically made product, almost all products and parts of products required at all levels of life are being made from plastic. As a result, the use of plastic is spreading rapidly worldwide and subconsciously we are contaminating the water, land and atmosphere with plastic pollution. Although 10 percent of these non-decomposable plastic wastes are burned and destroyed, the remaining 90 percent have endangered the world environment in various ways.

If the current trend continues, the production of plastic products in the world will almost double by the year 2031. The interaction of non-biodegradable plastic waste with UV rays and other environmental factors results in the release of micro and nano plastic particles and various harmful chemicals such as bisphenol

A, phthalates, bisphenol, organotin, per- and polyfluoroalkyl substances and brominated foam retardants into the environment. These plastic nanoparticles and harmful chemicals can alter the DNA and RNA molecules in the cells of humans and other organisms, causing cancer or nervous system damage and reproductive failure. Microplastics accumulate in the bodies of marine animals and fish and enter the human body through the food chain.

The worst pollution from plastic waste is coming from plastic or polythene bags. Every minute, 1 million plastic bags are discarded globally. Plastic bags are not biodegradable. In the air are released 150 kilograms of carbon dioxide and 2 gigajoules of heat when a tonne of jute sacks is thrown. On the other hand, burning a ton of plastic bags releases 63 giga joules of heat and 1340 tons of carbon dioxide into the air. Plastic pollution has a particularly negative impact on the marine environment. As a result, 100,000 sea birds and 100,000 marine animals including giant whales die every year. The amount of plastic trash that enters the ocean every day, according to scientists, is 8 million pieces. This has resulted in the oceans becoming home to vast regions of accumulated plastic trash. The largest patch of plastic waste in the world, currently the Pacific Ocean covers 1.6 million square kilometers. Other seas and oceans have also developed similar plastic trash piles. In addition to the ocean floor, around 88% of the water's surface is also tainted by plastic waste.

Climate change and environmental pollution are two major challenges to human existence on Earth. Long-term detrimental effects on soil, water, atmosphere, wildlife, biodiversity, and human health are being caused by the addition of biodegradable plastic products, by-products, particles, or molecules released from plastic products to the environment. Growing opposition to the production and use of polybags that pollute the soil, water, and air has been voiced by the general people worldwide as a result of the climate movement due to rising environmental consciousness in both

the developing and developed worlds. Use reusable fabric, jute, or hard plastic bags in place of single-use thin polythene. In the laundry, polythene bags should be completely discontinued, and reusable cloth bags should be introduced. It is time to cease selling milk and other liquids in plastic bottles and start requiring their use instead. It's time to start following the common practice in the industrialized world of collecting each household's individual polythene and plastic waste. In this regard, it is important to raise public awareness through electronic, print, and other mass media as well as social media on the negative effects of plastic pollution as well as its sources.

Plastic pollution is a serious issue that threatens the environment, biodiversity, economy, and public health on a global scale. As the harmful effects of plastic are known, alternatives to plastic are being sought. To prevent plastic pollution, the technology of making biodegradable plastic using natural polymers has been discovered. Commercial recycling by consciously disposing of plastic waste, use of jute products as alternatives to plastic, use of cloth, paper or reusable bags instead of single-use polythene and inclusion of information about plastic pollution in the school curriculum are considered effective measures. For one thing, it appears that 10-13 percent of global warming is attributed to the burning of plastic waste. Considering these harms, the World Health Organization has recommended the use of eco-friendly jute sacks or bags for packaging food grains and sugar.

There are different types of plastic products and the materials used in their preparation. If it was possible to separate the biodegradable and non-biodegradable waste at source in our country, then waste management would be much easier. If all kinds of polythene and plastic waste are collected separately from each house, it is possible to recycle them and produce new ones. It is time to cease selling milk and other liquids in plastic bottles and start requiring their use instead. Companies or organizations that sell soft drinks water bottles and other plastic products, should take back those products after use. The old plastic products kept in the collection must be made into new plastic products in the recycling process. As a result, public health and the environment will be protected from plastic pollution. In this case, civil society, government and private organizations and plastic product manufacturing companies must work together.

The natural resource that supports the nation's blue economy, the Bay of Bengal, is now seriously harmed by plastic pollution. Plastic products could be charged more heavily to safeguard the

environment and the general people. Polythene should no longer be produced, advertised, or sold in our nation at all. Jute or chaat bags and cloth bags should be made available more frequently as an alternative to polythene. People should be encouraged to use jute products as an alternative to plastic. Cellulose, hemicellulose, and lignin are the major ingredients of jute yarn. Therefore, jute waste easily decomposes in the environment and increases soil fertility. To increase the use of jute and jute products, jute products have been designated as the "product of the year 2023" by the government. Employing golden bags made from Bangladesh's golden fibers rather than plastic and other jute products will help the government, civil society, and the media in their joint effort to inspire patriotism among the populace. The government can support manufacturers by providing subsidies for the manufacturing of jute goods to make them widely accessible.

Similar to past scientific breakthroughs, the discovery of plastic was unexpected and helpful. However, the mismanagement of plastic waste has put humanity in dire danger today and endangered the existence of humans and other creatures on Earth. Environmentally harmful plastic products or polythene bags have become a headache not only in Bangladesh but all over the world. Recently, several nations throughout the world have started to reject synthetic bags and other harmful products for the environment. Using natural fibers as much as possible. To better comprehend the scope and character of plastic pollution in our nation and to clean up the contaminated environment, interdisciplinary, coordinated research at the national level is required. We must move swiftly to stop plastic pollution alongside wealthy nations by enacting legislation that forbids the use of plastic products.