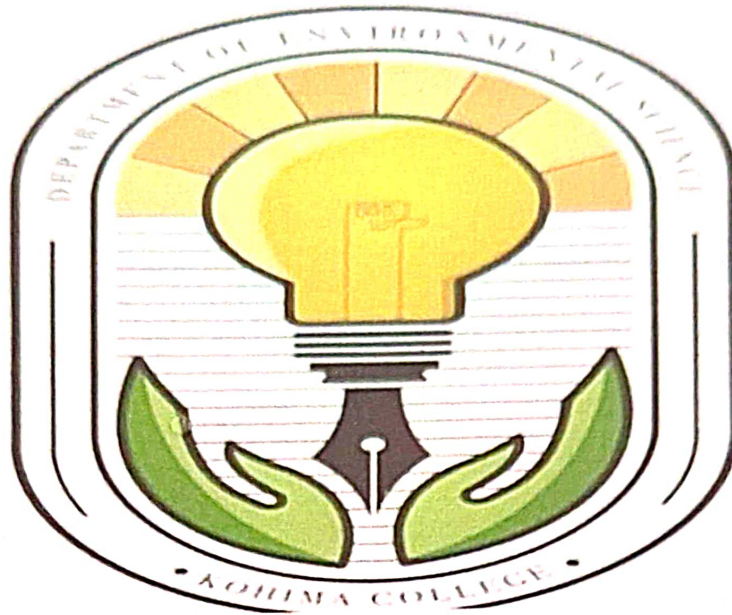


KOHIMA COLLEGE KOHIMA



PROJECT ON ENVIRONMENTAL SCIENCE  
TOPIC :PLASTIC POLLUTION AND IT'S CONTROL

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## \*INTRODUCTION\*

Plastic pollution is the accumulation of plastic objects and particles (e.g. plastic bottles, bags and microbeads) in the Earth's environment that adversely affects humans, wildlife and their habitat. Plastics that act as pollutants are categorized by size into micro-, meso-, or macro debris. Plastics are inexpensive and durable, making them very adaptable for different uses; as a result, manufacturers choose to use plastic over other materials. However, the chemical structure of most plastics renders them resistant to many natural processes of degradation and as a result they are slow to degrade. Together, these two factors allow large volumes of plastic to enter the environment as mismanaged waste which persists in the ecosystem and travels throughout food webs.

Plastic pollution is one modern day's biggest environmental issues. The wide spread use of disposable plastic to deliver single use products such as bottled water, grocery bags and shampoo bottles, has caused public outrage over the environmental disasters caused by the leftover plastic.

Plastic products have gained increasing popularity amongst consumers and retailers due to the fact that they are functional, light weight, strong, cheap and hygienic way of transporting foods and goods. Even flimsy plastic bags, which have been identified as the most prevalent post consumer waste, have popularity amongst small retailers. Unfortunately, the properties of plastic that make it so valuable make the disposal problematic.

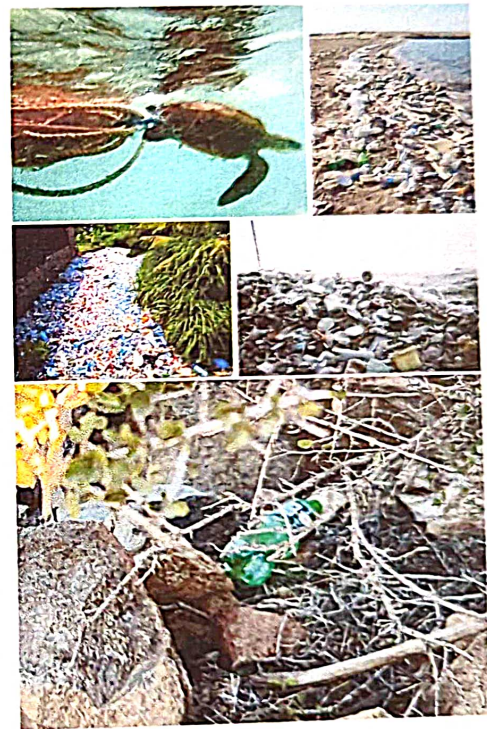
Every day, the equivalent of 2,000 garbage trucks full of plastic are dumped into the world's oceans, rivers, and lakes.

Plastic pollution is a global problem. Every year 19-23 million tonnes of plastic waste leaks into aquatic ecosystems, polluting lakes, rivers and seas.

Plastic pollution can alter habitats and natural processes, reducing ecosystems' ability to adapt to climate change, directly affecting millions of people's livelihoods, food production capabilities and social well-being.

UNEP's body of work demonstrates that the problem of plastic pollution doesn't exist in a vacuum. The environmental, social, economic and health risks of plastics need to be assessed alongside other environmental stressors, like climate change, ecosystem degradation and resource use.

Plastic pollution



## **Objectives on control of plastic pollution**

The objectives of controlling plastic pollution are multifaceted and aim to address the environmental, social, and economic impacts of plastic waste. Key objectives include:

### **1. Environmental Preservation:**

- **Ecosystem Health:** Minimize the detrimental effects of plastic pollution on aquatic and terrestrial ecosystems, preserving biodiversity and ecological balance.

- **Water Quality:** Prevent contamination of water bodies by reducing plastic waste, which can have severe consequences on marine life and overall water quality.

## 2. Human Health Protection:

- **Reduced Exposure:** Mitigate human exposure to harmful chemicals present in plastics by limiting the production and disposal of plastic products.
- **Safe Food Chains:** Prevent the entry of micro plastics into the food chain, safeguarding human health from potential risks associated with plastic ingestion.

## 3. Resource Conservation:

- **Energy and Raw Materials:** Reduce the demand for fossil fuels used in plastic production and conserve non-renewable resources by promoting alternatives and recycling.
- **Waste Management:** Alleviate the burden on waste management systems by decreasing the volume of plastic waste, thus promoting more sustainable waste disposal practices.

#### 4. **Climate Change Mitigation:**

- **Greenhouse Gas Emissions:** Address the contribution of the plastic life cycle to greenhouse gas emissions, focusing on reducing emissions associated with plastic production, transportation, and disposal.

#### 5. **Social and Economic Sustainability:**

- **Livelihoods:** Protect livelihoods dependent on healthy ecosystems, such as those of communities engaged in fishing and tourism.
- **Cost Savings:** Reduce the economic costs associated with cleaning up plastic pollution, healthcare expenses related to plastic-related health issues, and damage to infrastructure caused by plastic waste.

## 6. Promotion of Circular Economy:

- **Recycling and Reuse:** Encourage the development and adoption of circular economy principles, emphasizing recycling, reusing, and reducing single-use plastics.

- **Innovation:** Stimulate innovation in the design, production, and consumption of plastics, fostering the creation of more sustainable materials and products.

## 7. International Cooperation:

- **Global Collaboration:** Facilitate international cooperation and agreements to address the trans boundary nature of plastic pollution, recognizing that it is a global issue requiring collective action.

## 8. Public Awareness and Education:

- **Behavioural Change:** Raise public awareness about the environmental impacts of plastic pollution, aiming to change consumer behaviour and promote responsible consumption habits.

- **Education:** Educate individuals and communities about the importance of waste management, recycling, and sustainable practices to reduce plastic pollution.

By pursuing these objectives, the goal is to create a more sustainable and resilient future, minimizing the adverse effects of plastic pollution on the environment, human health, and economies.



## Causes of plastic pollution

Plastic pollution arises from various human activities and environmental factors. Some primary causes include:

1. **Single-Use Plastics:** Widespread use of single-use plastics, such as bags, bottles, and packaging, contributes significantly to pollution. These items are often discarded after a short lifespan, ending up in landfills or water bodies.

2. **Improper Waste Disposal:** Inadequate waste management practices, including littering and improper disposal, lead to plastic waste entering rivers, oceans, and other ecosystems. Insufficient

recycling infrastructure exacerbates the problem.

3. Microplastics: Degradation of larger plastic items into tiny particles, known as microplastics, occurs through natural processes and human activities like abrasion and breakdown. Microplastics then contaminate soil and water, posing threats to aquatic life and ecosystems.

5. Industrial Discharges: Industries that produce or use plastics may release pollutants into the environment through improper disposal or accidental spills. This can introduce harmful chemicals and plastics into water bodies.

6. Inadequate Recycling: Despite efforts to promote recycling, a significant portion of plastic waste is not properly recycled. Lack of awareness, limited recycling facilities, and economic factors contribute to this issue.

7. Overreliance on Plastics: Modern lifestyles heavily rely on plastic products due to their convenience and versatility. Excessive consumption and production of plastics contribute to the accumulation of plastic waste in the environment.

8. Poor Regulation and Enforcement: Weak regulations, inadequate enforcement of existing laws, and

lack of global coordination contribute to the persistence of plastic pollution. Stricter measures are needed to control the production, use, and disposal of plastics.

## EFFECTS OF PLASTIC POLLUTION

1. **Harm to Marine Life:** Plastic pollution poses a significant threat to marine animals. Sea turtles, seabirds, fish, and marine mammals often mistake plastic debris for food and ingest it. This can lead to internal injuries, digestive blockages, malnutrition, and ultimately death. Additionally, marine animals can become entangled in plastic debris such as fishing nets, lines, and packaging materials, leading to injuries, suffocation, and drowning.

2. **Disruption of Food Chains:** Plastic pollution can disrupt marine food chains and ecosystems. When marine animals ingest plastic, it can accumulate and magnify through the food chain, potentially affecting larger predators, including humans who consume seafood.

3. **Habitat Destruction:** Plastic pollution can damage and alter marine habitats such as coral reefs, mangroves, and seagrass beds. Plastic debris can smother and suffocate these habitats, reducing biodiversity and disrupting important ecological functions.

4. **Contamination of Water and Food Sources:** Microplastics, tiny plastic particles less than 5mm in size, contaminate water bodies, including oceans, rivers, and lakes. These microplastics can also enter the food chain when marine animals ingest them, leading to potential health risks for humans who consume seafood contaminated with microplastics.

5. **Risks to Human Health:** Plastic pollution poses health risks to humans through the ingestion of contaminated seafood and water, as well as through exposure to toxic chemicals leaching from plastics. Some chemicals found in plastics, such as phthalates and bisphenol A (BPA), have been linked to adverse health effects, including hormonal disruptions, reproductive problems, and developmental issues.

6. **Environmental Degradation:** Plastic pollution contributes to environmental degradation by clogging waterways, polluting beaches and coastlines, and releasing harmful chemicals as plastics break down over time. Plastic waste also contributes to greenhouse gas emissions when incinerated or when plastic debris interacts with sunlight and water to produce greenhouse gases such as methane and ethylene.

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The Indian government has implemented several policies to reduce plastic pollution. Here are some key measures:

- **Ban on Single-Use Plastics:** A nationwide ban came into effect on July 1, 2022, prohibiting the manufacture, sale, distribution, and use of specific single-use plastic items. This ban targets items with low utility and high littering potential, including plastic bags below 120 microns, cutlery, cups, plates, straws, and certain packaging materials [measures to eliminate single use plastic products pollution].
- **Extended Producer Responsibility (EPR):** This policy puts the responsibility on producers, brand owners, and importers for the collection, processing, and disposal of plastic waste generated from the products they manufacture or import [innovative ways in which india is tackling plastic pollution]. This incentivizes them to design products with minimal plastic or use recycled plastic content.
- **Plastic Waste Management Rules:** The government has formulated Plastic Waste Management Rules that outline regulations for plastic manufacture, use, collection, and disposal. These rules are regularly updated to address emerging challenges [Plastic Waste Management in India 2024].
- **Swachh Bharat Abhiyan:** This national cleanliness and sanitation mission, launched in 2014, includes initiatives to improve plastic waste collection and segregation. These efforts involve door-to-door collection, setting up community bins and plastic waste collection centers [Plastic Waste Management in India 2024].
- **Promotion of Alternatives:** The government encourages the use of eco-friendly alternatives to plastic, such as cloth bags, steel cutlery, and paper straws. Additionally, research and development are being supported to find sustainable bio-degradable options.

### Reducing Plastic Use:

Promote reusable alternatives: Encourage the use of reusable shopping bags, water bottles, and coffee cups instead of disposable plastic ones.

Support bans on single-use plastics: Advocate for policies that ban or restrict the use of single-use plastic bags, straws, and cutlery.

Choose products with less packaging: Look for products with minimal packaging, or packaging made from recycled materials.

### Improving Waste Management:

Invest in better waste collection and recycling infrastructure: Ensure proper waste collection systems are in place, especially in areas lacking proper infrastructure.

Encourage recycling: Promote recycling initiatives and educate people on proper waste sorting and disposal.

Develop technologies for plastic waste processing: Support research on improved methods for recycling various plastic types and biodegradation of plastics.

### Raising Awareness:

Public education campaigns: Educate people about the environmental and health impacts of plastic pollution.

Promote responsible waste disposal: Spread awareness about proper waste disposal habits to prevent littering.

Corporate responsibility: Encourage businesses to adopt sustainable practices, such as using recycled materials in packaging and reducing plastic use in their products.



In conclusion, plastic pollution is a pressing environmental issue with far-reaching consequences for our planet, wildlife, and health. Throughout this project, we've explored the devastating impacts of plastic pollution and the urgent need for action. From clogging waterways and harming marine life to contaminating food chains and leaching toxins into the environment, the consequences of plastic pollution are vast and alarming. However, there is hope. By implementing effective control measures such as reducing single-use plastics, promoting recycling and waste management initiatives, and advocating for policy changes, we can collectively make a positive impact. It's imperative that individuals, businesses, and governments take responsibility and work together to address this global challenge. Together, let's strive for a future where plastic pollution is a thing of the past, and our planet thrives in a cleaner, environment."