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# ENVIRONMENTAL DEGRADATION BY USE OF PLASTIC AND LAW ENFORCED FOR SUSTAINABILITY OF ECOSYSTEM

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## Abstract

In this modern world, people use plastic bags to carry things that are bought from shops such as food and clothes. The use of plastic products has been a part of human life and in their routine activities. Though plastic bags are hazardous to the environment they are commonly used the people around the world. Plastic waste which we consider urbanization has resulted in many deleterious environmental effects including clogging of the drains, rivers, and streams, animal choking, soil pollution, and disfigurement of the landscapes. As a result of these effects, some national governments have banned the use of plastic bags for shopping. Taking into account the effects caused by using plastics on agricultural production many countries formulated the law to control the use of plastics, such as South Africa implemented a law to restrict the manufacturing and usage of plastic bags, and many European countries as well as Japan limited the production and use had levied fee. Since plastic can be harmful to the environment, solutions are required to limit, reduce, and minimize the use of this material for succoring environmental preservation. However, altering an ingrained habit of using plastics is difficult among mankind. Establishing certain law and enforcement policies is considered an alternative to the problem to protect the environment from increased plastic waste. This paper was aimed at exploring issues revolving around the custom of using plastic materials among people and investigating the concept of law enforcement as a solution to limit and reduce the use of plastic.

**KEYWORDS:** plastics waste, environment depletion, law, policy, and eco-system.

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## INTRODUCTION

At the beginning of the 20<sup>th</sup> century, plastic emerged and started to develop in the 1930s, with polyethylene. For plastic, the Second World War was a revolution and after the war, the companies started to manufacture it for the use of consumer goods. The term plastic originated from the Greek term “plastikos” which means to grow or form<sup>i</sup>. The real meaning of the term “Plastic” is “malleable”. Recently it has emerged as polymers for a category of materials. Its diffusion in society brought several socio, economic, and environmental advantages. Plastics are concocted of synthetic organic polymers which are widely used in various applications ranging from water bottles, clothing, food packaging, medical supplies, electronic goods, construction materials, etc. In three scores, plastics became an indispensable and versatile product with a wide range of properties, chemical composition, and applications. Though, plastic was initially assumed to be harmless and inert, after many years of plastic disposal in the natural environment have led to diversified problems. Environmental pollution that endangers the ecosystem, plastic waste is now acknowledged widely to be a major environmental disaster, especially in the aquatic environment where there is a biophysical breakdown of plastics that will last long, with deleterious negative effects on wildlife and limited solution to remove plastic.

Research on the monitoring and impacts of plastic waste is still at the infant stage, but so far, the reports are perturbed. In and around the surroundings of humans plastics made of petrol-based polymer are present in high quantity. Plastics have various toxic components among them which can reach out to have adverse effects on the ecosystem are phthalates, poly-fluorinated chemicals, Bisphenol A (BPA), brominated flame retardants, and antimony trioxide<sup>ii</sup>. Plastics that are used

to manufacture electronic goods and their electronic waste i.e., e-waste have become a serious global environmental and public health concern due to their bulk production and the presence of insufficient management policies in several countries. Recently in India to control the use of plastics the Ministry of Environment, Forest, and climate change implemented a law. According to the environment protection act 1986, sections 3, 6, and 25 brought forward an amendment in July 2022. The law is to prohibit the manufacture, import, stocking, distribution, sale, and use of single-use plastic products from July 1, 2022.

## TYPES OF PLASTICS AND THEIR USES

Plastics can be divided into different types according to their composition of materials. Here follows some of its types, properties, and how they are used.

### Polyethylene Terephthalate (PET)

Polyethylene Terephthalate (PET) is the chemical name of Polyester. It is a kind of plastic that is clear, strong, smooth, transparent, and relatively thin. PET is produced by the polymerization of ethylene glycol and terephthalic acid. The low softening temperature of PET approximately 70° C (160° F) prevents it from being used as a container for hot foods. It is used in fibers for clothing, containers for liquids and foods, and thermoforming for the manufacturing of disposable cups, containers, lids, trays, blisters, clamshells, and other products for the food, and medical industries. Commonly, PET is manufactured for single use only.

### High-density polyethylene

High-density Polyethylene (HDPE) is the most common plastic which is used worldwide. High-density polyethylene is a hydrocarbon polymer that can be produced

from ethylene via a catalytic process. Because its heat-resistant products made of high-density polyethylene are long-lasting and easy to maintain. Food-stored containers made of HDPE do not get contaminated by the polymer, making it quite safe for humans. It is a major element in making refrigerators, detergent bottles, toys, milk containers, varieties of plastic grocery bags, etc.

### **Polyvinyl Chloride (PVC)**

Worldwide Polyvinyl Chloride (PVC) is the third most produced synthetic polymer of plastic. PVC has two basic forms they are rigid and flexible plastics. The rigid form of plastic is used in industries like plumbing, sewage, and agriculture. Flexible plastic is generally used in construction as insulation on electrical wires or in flooring for homes, hospitals, schools, and other areas where a sterile environment is a priority<sup>iii</sup>. PVC is flexible due to the content of phthalates. Phthalates are very harmful to the creatures. The PVC life span that includes production, usage, and disposal is capable of causing a severe hazard to the environment and recently its usage is reduced considerably. In recent studies, PVC has been reported to cause chronic bronchitis, birth defects, genetic changes, cancer, skin diseases, deafness, vision failure, ulcers, liver dysfunction, and indigestion.

### **Low-density Polyethylene**

Low-density polyethylene (LDPE) is a thermoplastic produced from the monomer ethylene. It is heat resistant, fragile, flexible, and rigid. LDPE is widely used for manufacturing various containers, dispensing bottles, wash bottles, tubing, plastic parts for computer components, and various molded laboratory equipment. Its most common use is in plastic bags and packaging foam. While plastic is not harmful for humans it is commonly used in the packaging of milk, frozen foods, and juices.

## **ENVIRONMENT IS POLLUTED BY PLASTIC WASTES**

Plastic waste that is distributed all over the world is associated with human populations. As the human population increases, it has led to increase the demand for plastics and plastic products<sup>iv</sup>. Haphazard disposal of wastes from plastics and plastic products has led to environmental pollution which is evident in several ways including the deterioration of landscapes, aquatic organisms getting tangled, and clogging of the sewage system in towns and cities especially in developing countries, which result in creating conducive environment for the mosquitoes to breed and other disease caused by the foul smells, reduction in water percolation and infertility of normal agricultural soils.

## **MANAGEMENT OF PLASTIC WASTE**

It's time to awaken; so many countries around the world had implemented the law to ban plastics. We cannot totally get rid of using plastic from our daily life but we can control it by following these steps. The first step is Recycling - which refers to the waste management method which collects waste materials and converts them into raw materials that can be reused to form other valuable products. It is also known as renewing or reusing. It contains water bottles and other disposal materials that can be melted and transformed into other products like plastic tables and chairs which have a long life<sup>v</sup>. Secondly, avoid using single-use items such as use and throw cups, straws, plastic cutlery, etc. go for shopping with your own cloth or jute bags. Replace the plastic containers with glass or steel jars.

## **LAW ENFORCED TO CONTROL THE USE OF PLASTICS**

In India, many states government have implemented laws to regulate the use of plastics. In March 2016 Ministry of Environment, Forest and

ClimateChangeframed certain rules for the precautions to be taken to reduce the use of plastics and it came into effect in 2018. These rules shall be called as the Plastic Waste Management (Amendment) Rules, 2018<sup>vi</sup>. These rules shall apply to every waste generator, local body, Grama Panchayat, manufacturer, Importers, and producer. As people all around the world got bound up with the use of plastics it is not possible to get rid of plastics all of a sudden, so the Government has laid certain conditions to the manufacturers of plastics and they are as follows:

- Carry bags and plastic packaging should be in natural shade without any added pigments or produced using only those pigments and colorants which are in conformity,
- Carry bags made of recycled plastic shall not be used for storing, carrying, dispensing, or packing ready-to-eat or drink foodstuff,
- Carry bags made of virgin or recycled plastic, shall not be less than fifty microns in thickness,
- Sachets made up of plastic material shall not be used for storing, packing or selling gutkha, tobacco and pan masala or other banned products.

According to the Plastic Waste Management Rules, the government of Tamilnadu has banned single-use plastics such as carry bags, tea cups, straws, paper plates, from the 1<sup>st</sup> of January 2019.

### **PLASTIC WASTE MANAGEMENT**

The rules mandate the generators of plastic waste to take responsibility and minimize the production of plastic waste, prevent littering of plastic waste, and also ensure that the stored waste is properly segregated. The local bodies, gram panchayats, retailers, waste generators, and street vendors are mandated through this Act to manage plastic waste.

- To facilitate the collection and recycling of plastic waste,
- To expand the jurisdiction of applicability of plastic waste management from the municipal area to rural areas,
- To introduce collect back system for plastic waste which ensures that the producers/brand owners collect back the plastic from customers in accordance with the producers' responsibility,
- To promote the use of plastic waste for road construction or energy recovery,
- Phasing out of non-recyclable multilayered plastic in two years' time,
- Imposing fees or charge on waste generators,
- Waste management systems to be set up by local bodies and Gram Panchayat for performing associated functions,
- Retailers and street vendors are to be held responsible for the carry bags, plastic sheets, and multilayered packaging in which they provide items to the consumers.

### **CONCLUSION**

It is a fact that plastics outlive us and will outlive our children because the useful duration of the plastics that we use is only for twenty minutes approximately but it takes over five hundred years to destroy. India has adopted one of the toughest laws in the world that is Anti-Plastic Law; this is adopted by 26 states and union territories which impose penalties, tax, and imprisonment for the use of banned plastics. It also imposes responsibility on the plastic-producing industries to produce plastics with social responsibility and insists them avoid plastic which is harmful in nature. The efforts to ban single-use plastic though started with vigor yet remained largely on paper. Most of the items prohibited by the rules are still

marketed and routinely used in most places. There is a lack of awareness among the people about the ban imposed and they continue to use the banned materials. Though plastics are very useful in our daily life the toxic chemicals used in production need to be thoroughly monitored, so as to ensure the safety of the ecosystem. The human race selfishly to lead a luxurious life got trapped in the world of plastics. And to sneak out of it we need to use and dispose of it efficiently because the earth belongs to each and every organism living on the earth and every creature has its own right to live on it.

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