

CHALLENGES IN REGULATING PLASTIC WASTE AND POLLUTION CAUSED BY HUMANS

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ABSTRACT

In the modern world, after industrialisation, there has been more utilisation of new stuff that is deleterious to the environment. The hazardous material ruins the quality of land and water and in many more ways possible. The pollution is sustained indefinitely for a longer period of time, causing lots of damage to the environment. The major factor that affects the land and soil is plastics. Even in a developing country like India or in a developed country like China, it is an inevitable source of production for future requisites. Both developed, and developing countries have failed to reduce the production and consumption of plastics in the modern era, which has caused the impairment of normal physiological functions and affects humans, habitats, and parts or all of the organisms that are sustained in this land.

INTRODUCTION

The increasing pollution is in no way a good path to pass over a good peace of living spot for the future Generation. Increasing pollution is increasing toxicity, increasing danger levels of risks, decreasing the quality of life for future human survival, and decreasing the quality of environmental peace and nature. In order to reduce the level of hazardous life created by such kinds of pollution, it is necessary to analyse, observe, and find a solution to reduce toxicity. The major way to reduce such pollution is to eradicate the main subject of pollutants, but it is not practically possible in the case of human needs. Thus, we must find other remedies like reducing the usage of plastics, finding suitable needs for plastic, finding alternatives to plastics, and proper ways of disposal of plastics. Thus, let us briefly discuss the need to build a healthy atmosphere for future generations using various needs and necessities relating to it in further context.

REGULATE PLASTIC WASTES AND POLLUTION CAUSED BY HUMANS

Regulating plastic waste and pollution requires a multifaceted approach encompassing various strategies and measures. Firstly, governments can implement legislation and policies aimed at

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reducing plastic consumption, such as bans or restrictions on single-use plastics and the promotion of reusable alternatives. Extended Producer Responsibility (EPR)¹ schemes hold producers accountable for the entire lifecycle of their products, encouraging them to design more sustainable packaging and invest in recycling infrastructure. Strengthening waste management systems, including improved collection, sorting, and recycling facilities, is essential for reducing plastic leakage into the environment. Public awareness campaigns and education initiatives can also foster behaviour change, encouraging individuals to reduce plastic use and properly dispose of waste. Innovation in materials science and technology, such as biodegradable plastics and alternative packaging materials, offers promising solutions to mitigate plastic pollution. Overall, a combination of regulatory frameworks, infrastructure improvements, collaborative efforts, and innovation is necessary to effectively regulate plastic waste and pollution.

GENERAL FORMS OF PLASTICS USED IN DAILY BASIS

Plastics are ubiquitous in our daily lives, found in a wide range of products and packaging due to their versatility, durability, and affordability. Common forms of plastic items include packaging materials such as plastic bags, bottles, containers, and wrappers used for food, beverages, and consumer goods. Household items like utensils, storage bins, and appliances often contain plastic components. Textiles made from synthetic fibers like polyester and nylon, found in clothing and carpets, are another prevalent form of plastic use. Also, electronics and electrical devices incorporate various plastic parts for insulation, casing, and circuitry. Personal care products such as toothbrushes, shampoo bottles, and cosmetics packaging are also commonly made from plastic. Furthermore, construction materials like pipes, flooring, and insulation frequently rely on plastics for their lightweight and durable properties. In essence, plastics have become integral to modern life, permeating nearly every aspect of our daily routines and environments.

DISPOSAL OF PLASTICS

Plastic items are disposed of through various methods, but not all are environmentally responsible.

¹ OECD Library (Chapter 1) Extended producer responsibility – an overview (Last visited 23rd February, 2024)

One common method is landfill disposal², where plastics are buried in designated sites. However, plastics can take hundreds of years to decompose in landfills, contributing to environmental pollution and resource wastage.

Incineration³, where plastics are burned to generate energy. While this can reduce the volume of waste, it releases harmful pollutants and greenhouse gases into the atmosphere, posing health and environmental risks.

Recycling⁴ is a more sustainable option, where plastics are collected, sorted, and processed into new products. However, recycling rates vary widely depending on factors such as infrastructure, consumer behaviour, and market demand.

A significant amount of plastic waste ends up in the environment, either intentionally or unintentionally, through littering, illegal dumping, or inadequate waste management practices. This leads to pollution of ecosystems, harming wildlife, contaminating waterways, and impacting human health. Overall, promoting responsible waste management practices, increasing recycling infrastructure, and reducing plastic consumption are essential for addressing the challenges of plastic disposal and pollution.

DECOMPOSITION OF PLASTICS

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The period for plastic decomposition varies depending on the type of plastic and environmental conditions. Generally, plastics are known for their durability and resistance to natural degradation processes.

PET (polyethene terephthalate)⁵ is a linear thermoplastic polymer used in beverage bottles and can take hundreds of years to decompose under typical environmental conditions.

HDPE (high-density polyethene),⁶ used in milk jugs, may take several decades to break down.

² WB Waste, Plastic Waste Disposal Methods, WB Waste solutions. LLC, (Last visited 27th February, 2024, 10:57 PM) <https://www.wbwaste.com/blog/plastic-waste-disposal-methods/>

³ WB Waste, Plastic Waste Disposal Methods, WB Waste solutions. LLC, (Last visited 27th February, 2024, 10:57 PM) <https://www.wbwaste.com/blog/plastic-waste-disposal-methods/>

⁴ WB Waste, Plastic Waste Disposal Methods, WB Waste solutions. LLC, (Last visited 27th February, 2024, 10:57 PM) <https://www.wbwaste.com/blog/plastic-waste-disposal-methods/>

⁵ A&C Plastics, INC, <https://www.acplasticsinc.com/> (Last visited 3rd March, 2024)

⁶ A&C Plastics, INC, <https://www.acplasticsinc.com/> (Last visited 3rd March, 2024)

However, even as plastics degrade, they do not fully biodegrade like organic materials. Instead, they fragment into smaller pieces known as microplastics, which persist in the environment for much longer periods. Factors such as exposure to sunlight, moisture, and microbial activity can accelerate or slow down the decomposition process. In marine environments, where conditions may be less conducive to decomposition, plastics can persist for even longer periods. The slow decomposition of plastics contributes to their accumulation in the environment, posing significant challenges for waste management and environmental conservation efforts.

DAMAGES DUE TO THE USAGE OF PLASTICS

The usage of plastic has led to a myriad of damages to both the environment and human health. Environmental damages include pollution of land, waterways, and oceans, as plastic waste accumulates in ecosystems, harming wildlife through ingestion, entanglement, and habitat destruction. Marine life suffers greatly, with marine animals mistaking plastic debris for food, leading to internal injuries, starvation, and death. Plastics release harmful chemicals as they degrade, contaminating soil and water with toxic substances that can enter the food chain and pose risks to human health. Plastic pollution also impacts ecosystems by altering nutrient cycles, disrupting marine habitats, and promoting the spread of invasive species. Plastic waste exacerbates climate change by contributing to greenhouse gas emissions during production and disposal processes. Beyond environmental concerns, the economic impacts of plastic pollution are significant, affecting industries such as tourism, fishing, and agriculture. The damages caused by plastic usage underscore the urgent need for effective regulation and sustainable alternatives to mitigate its adverse effects on the planet and future generations⁷.

REMEDIES AGAINST THE EFFECT OF DAMAGES:

Several remedies have been proposed and implemented to address the effects of damages caused by plastic usage. Waste management, including initiatives to reduce, reuse, and recycle plastic materials. This involves implementing policies such as bans on single-use plastics, promoting eco-friendly alternatives, and improving recycling infrastructure to minimise plastic pollution. Clean-up efforts, such as beach clean-ups and river restoration projects, help remove existing plastic waste from the environment and prevent further harm to ecosystems. Innovation in materials science has led to the development of biodegradable plastics and alternative packaging materials that reduce reliance on traditional plastics and minimise

⁷ S. Shanthakumar, Introduction To Environmental Law, pg no:165 , (2nd ed.2004)

environmental impacts. Education and awareness campaigns play a crucial role in fostering behaviour change, encouraging individuals to adopt sustainable practices and reduce plastic consumption. By implementing these remedies collectively, society can work towards mitigating the adverse effects of plastic usage and fostering a more sustainable relationship with the environment.

STATUTES, ACTS AND SCHEMES BY THE GOVERNMENT OF INDIA

The Government of India has implemented several statutes, acts, and schemes to reduce the usage and toxicity caused by plastics.

Plastic Waste Management Rules, 2016⁸

Plastic Waste Management (Amendment) Rules, 2021⁹

The Swachh Bharat Mission, launched in 2014¹⁰

Plastic Waste Management Rules, 2016

It aims to regulate the manufacture, sale, usage, and disposal of plastic materials. Under these rules, the government has introduced measures such as the phasing out of certain single-use plastics, extended producer responsibility (EPR) requirements, and the promotion of recycling and waste management practices.

India has enacted the Plastic Waste Management (Amendment) Rules, 2021, to further strengthen regulations and enhance accountability for plastic waste management.

The Swachh Bharat Mission, Launched in 2014

It includes initiatives to promote cleanliness and hygiene, including the reduction of plastic waste through public awareness campaigns and infrastructure development. Furthermore, various state governments have implemented their own regulations and schemes to address plastic pollution, such as bans on plastic bags and the establishment of plastic waste collection and recycling facilities. These legislative and policy measures demonstrate the government's commitment to tackling the challenges posed by plastic usage and toxicity in India.

⁸ Plastic Waste Management Rules, 2016, Acts of Parliament, 2016 (India).

⁹ Plastic Waste Management (Amendment) Rules, 2021, Acts of Parliament, 2021 (India).

¹⁰ NITI Aayog, National Portal Of INDIA, <https://www.niti.gov.in/> (Last visited 10th March, 2024)

STATUTES, ACTS AND SCHEMES ALL OVER THE WORLD:

Across the world, numerous statutes, acts, and schemes have been implemented to reduce the usage and toxicity caused by plastics.

The European Union's Single-Use Plastics Directive¹¹ targets the most commonly found plastic items polluting European beaches and aims to significantly reduce their consumption. Many countries have introduced bans or restrictions on single-use plastics, such as plastic bags, straws, and utensils, to curb their usage and promote sustainable alternatives. Extended producer responsibility (EPR) schemes, which make producers financially responsible for the collection and recycling of their products, have been adopted by various nations to incentivise waste reduction and recycling.

International agreements like the Basel Convention¹² regulate the transboundary movement of plastic waste, aiming to prevent the dumping of plastic waste in developing countries.

Public awareness campaigns, beach clean-ups, and investment in recycling infrastructure are common strategies employed globally to address plastic pollution comprehensively. These legislative and policy measures reflect a concerted global effort to combat the environmental and health impacts of plastic usage and toxicity.

ALTERNATIVES OF PLASTIC

The best alternative usage of plastics is plant-based biodegradable polymers. These polymers are derived from renewable resources such as corn starch, sugarcane, or cellulose, offering a sustainable alternative to traditional plastics derived from fossil fuels. These biodegradable polymers can be used in various applications, including packaging, disposable utensils, and food containers. They break down naturally over time, reducing the accumulation of plastic waste in the environment and minimising harm to ecosystems and wildlife. These materials often have comparable performance characteristics to conventional plastics, making them suitable replacements in many contexts without sacrificing functionality. By shifting towards plant-based biodegradable polymers, industries can lessen their dependence on non-renewable resources and mitigate the environmental impact associated with plastic production and disposal. However, it's essential to ensure that these biodegradable alternatives are produced

¹¹ European Commission, Energy, Climate Change, Environment, An official website of European Union <https://environment.ec.europa.eu/> (Last visited 12th March, 2024)

¹² Basel Convention, UN Environment Programme, <https://www.basel.int/> (Last visited 13th March, 2024)

sustainably and do not compete with food crops or lead to deforestation, thus maintaining a balance between environmental benefits and potential drawbacks.

RESULT OF THE RESEARCH

The above research, by analysing all the contents on regulating plastic waste and pollution, reveals a comprehensive understanding of the multifaceted challenges posed by plastic usage and its adverse effects on the environment and human health. Through legislative measures, such as the Plastic Waste Management Rules and the Swachh Bharat Mission in India and initiatives like the Single-Use Plastics Directive in the European Union, governments worldwide are striving to reduce plastic consumption, promote recycling, and foster sustainable alternatives. However, despite these efforts, plastic pollution persists as a global issue, necessitating further action and innovation.

The detrimental impacts of plastic usage, including environmental pollution, habitat destruction, and health risks, underscore the urgency of finding effective solutions. Remedies such as waste management strategies, clean-up efforts, and the development of biodegradable alternatives offer promising avenues for mitigating plastic pollution. Public awareness campaigns and education initiatives play a crucial role in fostering behavioural change and encouraging individuals to adopt sustainable practices¹³.

Alternative materials, particularly plant-based biodegradable polymers, present a viable solution to reduce reliance on conventional plastics derived from fossil fuels. These materials offer comparable functionality while minimising environmental harm and contributing to a more sustainable future. However, it is essential to ensure that the production and use of biodegradable alternatives are sustainable and do not inadvertently exacerbate other environmental challenges.

By concluding the facts, addressing plastic waste and pollution requires a concerted effort involving governments, industries, communities, and individuals. By implementing regulatory frameworks, promoting innovation, and raising awareness, society can work towards reducing plastic consumption, enhancing waste management practices, and mitigating the adverse impacts of plastic pollution on the planet and future generations.

¹³ S. Shanthakumar, Introduction To Environmental Law, pg no:455 , (2nd ed.2004)

SUGGESTIONS

Though it is a global cause that affects the atmosphere, it is an individual duty and responsibility to reduce and take control of such conditions, making an environment free of plastics. More innovations, lesser usage of plastics and other forms of plastics, more government schemes, and other networking ideas with an effective way to destroy the condition of exploitation are mandatory to lead a long life of this environment body.

CONCLUSION

A single human activity can bring lots of changes to the environment. The research underscores the urgent need for comprehensive measures to regulate plastic waste and pollution, considering its detrimental impacts on the environment and human health. By analysing the various forms of plastic usage, disposal methods, decomposition rates, and associated damages, it becomes evident that a multifaceted approach is necessary. Legislative actions, such as bans on single-use plastics and Extended Producer Responsibility (EPR) schemes, coupled with improved waste management infrastructure and public awareness campaigns, are crucial for mitigating plastic pollution. Also, the exploration of alternative materials, such as plant-based biodegradable polymers, offers promising avenues for reducing reliance on traditional plastics and fostering sustainability. Overall, concerted efforts at local, national, and international levels are essential to address the complex challenges posed by plastic waste and pollution and safeguard the well-being of current and future generations.

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