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Tackling the usage of single-use plastic and its consequences

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RESEARCH
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Issue: Tackling the usage of single-use plastics and its consequences

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Introduction

Nowadays, plastic is defined as a synthetic or semi-synthetic polymer. Polymers are quite abundant in nature, such as, silk, DNA, cellulose or protein. Synthetic polymers are derived from these examples. For instance, the first-ever plastic, Bakelite, invented by Leo Baekeland in 1907, was derived from coal tar and wood alcohol and it was the first fully synthetic plastic. Bakelite was marketed as “the material of a thousand uses” because it was a good insulator, durable, heat resistant, could be shaped or molded into almost anything, and suited for mechanical mass production unlike a polymer found in nature like celluloid.

Terms like “Single-use” or “disposable” are used for plastics that are meant to be used only once before getting thrown away or recycled, such as, plastic bags, straws, water bottles, most food packaging, etc. Half of the plastic produced annually is for the purpose of single-use. Although many other plastics were subsequently developed over the next few decades after the development of Bakelite, it was not until the 1940s and 1950s, that mass production of everyday plastics items commenced. That is why, the popularity of disposable plastics skyrocketed with the manufactures replacing traditional staples with lighter, more durable, and affordable plastic alternatives. Even if these cases make up a small fraction of single-use plastics, there are many uses for disposable plastics that are crucial, such as surgical gloves, blood bags, or syringes in healthcare that maintains a more affordable system. However, for all the good plastics came with, today we make 99% of our plastics using non-renewable sources and fossil fuel-based chemicals (petrochemicals), which makes them non-biodegradable. It can take thousands of years for single-use plastics to decompose, thus contaminating the soil and water in the process, choking waterways, and exacerbating natural disasters.

Plastic pollution, caused by single-use plastics, is the most widespread problem affecting our planet. It requires an enormous amount of energy and resources, causing carbon emissions and contributing to climate change, threatening every habitat and inhabitant. In line with this year’s conference theme, “Combating Polarization In Times of Global Crises”, the variety of beliefs and parties around the globe creates a polarizing effect that seems to reach a dangerous state, damaging institutions essential for democracy. The usage of single-use plastics too creates this effect, thus, it is crucial to close this gap between polarized groups at the earliest by debating on this issue to achieve cooperation and collaboration, which is vital in times of international emergencies.

Definition of Key Terms

Plastic: Plastic is a material consisting of a wide range of synthetic or semi-synthetic organic compounds that are malleable and can also be molded into solid objects.

Synthetic: Something made of artificial material, not natural items, can be described as synthetic.

Microplastic: Small plastic particles are formed through a process called abrasion. These can be found in oceans, the air, packaged goods, and more.

Abrasion: The process of scraping or wearing something away. Plastic products experience this which then create harmful microplastics that get into our food, drinks, etc.

Circular Economy: Also referred to as circularity, circular economy is an economic system aimed at eliminating waste and the continual use of resources.

General Overview

Single-use plastics are extremely prominent around the world, with an estimated 50% of all the plastics we use is single-use. Taking into account both disposable and reusable plastics, we produce 300 million tons of plastics per year, with 8 million tons of them being dumped into our oceans. These plastics are used not more than one day, yet they don't decompose for several hundred years. Over time, when they start the decomposition process, plastics break up instead of breaking down. Sun and heat turn plastics into smaller and smaller pieces until they become microplastics, also known as microbeads. Plastic debris can come in all shapes and sizes, but those that are less than five millimeters in length are called microplastics which can easily end up in the water, join into the food chain, eaten by wildlife and humans.

One bottle of water consumed by an individual today will outlast multiple generations of that individual, and the average individual in the EU uses about 31 kilos of plastic per year. At the current rate of consumption, it is estimated that the production of plastic could account for about 20% of the oil industry by the year 2050, however, this could be higher since the demand seems to increase. The plastic we produce is extremely harmful to the environment due to the fact that the fossil fuels we use in the plastics is foreign to all ecosystems on earth, and is toxic to wildlife and plant life that inhabit these ecosystems.

Mismanagement of single-use plastics has drastically increased in the past few years, affecting many fields such as the environment, economics, and health. The single use of plastics causes economic loss in many industries such as tourism, fishing, and shipping. It requires a high transportation cost to a centralized plant of lightweight foamed plastics due to difficulty in recycling at local plants. Moreover, it makes future costs obligatory for the removal of accumulated plastic litter in the environment, etc. Disposable plastics also block sewage systems and provide breeding grounds for mosquitoes, which raises the risk of malaria transmission, it releases toxic chemicals and emissions if burned welfare losses that cause visual pollution and contaminates food chains. Most plastics we produce are made from non-renewable sources. This means that there is no natural process that can absorb non-biodegradable plastic into the natural biological cycle. Plastic can not be composted or left to rot, so it must be either recycled or incinerated.

The plastic waste crisis is a symptom of the single-use approach in society as well. As a planet, we use finite materials such as oil, metals, or minerals of which sources are available to us just once. Thus, using fewer sources or materials does not solve any problem but it buys us some time. Creating a circular economy is one of the most recommended ways to tackle this issue, which suggests that all products, especially plastics, metals, and textiles, should be designed with the intention that their raw materials will and can be recovered and recycled. The circular economy delivers long-term benefits to the

environment, protecting oceans from the onslaught of plastics, microplastics, and sparing soil from landfill pollution.

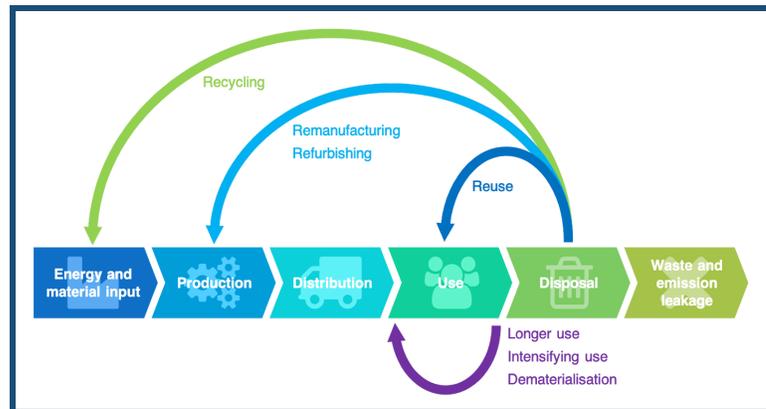


Figure 1: An illustration of the circular economy concept

Major Parties Involved and Their Views

USA

In March of 2019, U.N Member States agreed to reduce their single-use plastic consumption drastically by 2030. The US has not fully followed through with this agreement. There is no national ban on the use of single-use plastics, however, certain states such as Hawaii and California have banned it of their own accord.

China

China is the most significant producer of plastic to date, producing 60 million tonnes per year. The problem is so bad that in 2008, there was a full-on ban on plastic, however the enforcement of this law is very poor.

UK

There have been many restrictions placed on single-use plastics in the UK recently, mainly focusing on the pollution of the ocean, and limiting certain serviceware items.

France

France is the first country to have banned plastic cups. Following the “Energy Transition for Green Act”, they will also include plastic straws, coffee stirrers, cotton buds, and other single-use plastic items.

India

In 2019, India has shelved plans on a nationwide ban on disposable plastic products because it was seen as too disruptive for industry at a time when it was coping with an economic slowdown and job losses. Nevertheless, India has vowed to completely get rid of single-use plastics by the year 2022.

Timeline of Events

1907	<i>The first-ever fully-synthetic plastic, Bakelite, is developed by Belgian-born American chemist Leo Hendrik Baekeland</i>
1912	<i>Cellophane is invented</i>
1939	<i>Nylon stockings are created by DuPont</i>
1950-1970	<i>Polyester becomes commercially available but plastic production remains relatively low</i>
1990-1999	<i>Plastic production triples and the number of waste increases at about the same rate</i>
2000	<i>Plastic waste increases more in one decade than in the last 40 years</i>
2002	<i>Ireland introduces a €0.15 tax on plastic checkout bags. An estimated 90 percent of consumers switched over to reusable bags within a year. The tax was increased to €0.22 in 2007.</i>
2008	<i>Chinese officials announced a nationwide ban on plastic bags, to take effect in Jan. 2009. The country was using an estimated 3 billion bags per day.</i>

Treaties and Events

- Earth Summit, 1992
 - In Rio de Janeiro, Brazil, 178 countries adopted the 21 Agenda, outlining the protection of the environment and the betterment of human lives through a global partnership.
- 1st United Nations Environment Assembly (UNEA-1), 2014.
 - The countries present discussed the post-2015 sustainable development agenda. UNEA-1 adopted 17 resolutions, among them those on the improvement of air quality, measures to prevent illegal trade of wildlife and taking action regarding marine debris and microplastics.
- In 2015, all United Nations Member States adopted the 17 sustainable development goals for 2030, which included increasing regulations on plastic use.

Evaluation of Previous Attempts to Resolve the Issue

According to the UN report: “Banning single-use plastic: lessons and experiences from countries” UN Environment Report(2018), 127 countries had placed some restrictions on the usage of plastic bags by July 2018. The effectiveness of these bans and restrictions depended on how well they were planned, implemented, and enforced; however, some have not been effective with people illegally distributing plastic bags.

Possible Solutions

Priority actions to minimize the usage of single-use plastics can be resolved into 5 different stages. Governments can first improve waste management systems and segregate waste at sources in order to transport and safely store the waste, recycle the materials in a cost-effective manner and ensure less landfilling. Secondly, they can promote eco-friendly alternatives to eliminate disposable plastics such as introducing economic incentives including taxes or funds and supporting projects to upscale recycling. Third, they can educate the consumers to make environmentally friendly products and choices by creating awareness campaigns, developing new school education programs incorporated in curriculums. Fourth, voluntary reduction strategies can be implemented since it raises social awareness and can lead to voluntary agreements between government and retailers. Finally, levies on the use and sale of single-use plastic items can be banned and introduced via regulatory, economic, and combination instruments.

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