

FORUM - ENVIRONMENTAL

ISSUE - LIMITING THE NEGATIVE IMPACTS OF SINGLE-USE PLASTICS AND THE MICROPLASTICS ON THE GLOBAL MARINE AND LAND ENVIRONMENT

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POSITION - “Green Ambassador” member

Introduction

“Single use” meaning to be used once and then thrown away. This is the nature of our current society. We consume mindlessly, we keep no track of our own waste, we don't do enough research on how our planet is currently reacting, and above all we simply don't care, because we feed into the idea that someone else will come along and fix it. This is one of the simplest ways to doom our islands, oceans and continents. Keep in mind that one of the main reasons that single use plastics is a problem is because of its sheer size. According to the Environmental Protection Agency, over 380 billion plastic bags are consumed in the United States each year alone. All this because of single use plastics.

Definition of Key Terms

Microplastics

Microplastics are fragmented pieces of plastic that are generally less than 5 milliliters or 0.2 inches in size. They break off larger pieces of plastic and enter our ecosystems due to irresponsible waste management, and ultimately plastic pollution. It's infamously harmful because it blocks the digestive tracts of marine life that accidentally ingest it.

Single use plastic

A product with the intended capacity to be used once and then thrown away. Examples of these are, plastic bottles, plastic bags, straws and polyester foam. These items can easily be replaced and are unnecessarily polluting our planet. Non-single use plastics are things like, sanitary items, syringes, and green “reusable” plastic bags. These items aren't labeled single use plastic because they

are used more than once or because they are not easily avoidable.

Plastic

According to the *United Nations Environment Programme* plastic is “is a lightweight, hygienic and resistant material which can be moulded in a variety of ways” to make things a little more clear plastic is basically a resource that is durable and cheap. However it takes from 450 to 1,000 years to decompose. This phenomenon combined with the fact that people are careless causes an unwanted build up of waste with no clear solution as to where to put it or deal with it.

Background Information

Humans generally have a lot of products to sell and consume, and when selling and using these products we tend to sway on what is cheap and durable, and what better to use than plastic. Companies and consumers like plastic because it keeps products dry, safe while staying within their budgets. The problem with this is that plastic doesn't decompose, it floats around in our oceans and is accidentally ingested by seals, whales and turtles. Plastic also breaks down into microplastics which settles into water and soil, releasing harmful chemicals.

One of the main problems in microplastics is that their bioaccumulation potential increases with decreasing size, meaning that the smaller the plastic gets the easier it is to be consumed by Marine and Terrestrial animals. Though study on this subject is scarce there's no reason not to believe that microplastics are affecting the environment. For example, scientists have found that zooplankton have had reduced algal feeding, or in another case increased mortality and decreased fertility in copepods. All of this is potentially due to microplastics floating in our oceans, but the oceans aren't the only ones affected by plastic. According to the *UN's Environment Programme* “Researchers in Germany are warning that the impact of microplastics in soils, sediments and freshwater could have a long-term negative effect on such ecosystems. They say terrestrial microplastic pollution is much higher than marine microplastic pollution – estimated at four to 23 times higher, depending on the environment.” Remember that 79% of plastic is now sitting in landfills rather than being recycled or incinerated thus adding to the problem.

In the end, understand that when talking about plastic pollution, or coming up with any new solutions for this problem is that this is an ongoing issue with no clear answer. The amount of waste released into our oceans and lands is too high to be solved quickly, and it will take a lot of time, money and research to be resolved. However, no matter how bleak the foreseeable future seems to be, remember that we are the human race.

Possible Solutions

When talking about solutions regarding single use plastic please take into account that this is an ongoing problem with not clear, cheap or quick solution yet. Had we found a solution that filled those categories I assure you that the problem would already be fixed, and there would be no need for a “Green Ambassador Association” to discuss it.

That being said there has been talk about a specific fungus “Aspergillus Tubingensis.” Apparently this fungus is able to eat polyurethane, a common plastic found in fake leather and fridges. The fungi took only weeks to eat the plastic as opposed to years, and this is a great starting point, but it isn't an answer. Fungi are very sensitive when it comes to climate and temperature. Even if they were better suited for harsh environments you'd still have to dig and fish out years of plastic waste, and don't forget that some of the plastics are ingested by marine and terrestrial life in the form of microplastics.

Though this “solutions” paragraph had more problems than answers it is not impossible. It is important to understand the gravity of this situation and lean in on the subject with a realistic view. Cleaning years of waste is not going to be simple, but I urge you to get creative and do your own research on this task. You specifically are a valuable member and your efforts do and will make a difference.

Bibliography

“This Fungus Eats Polyurethane.” *Sierra Club*, 15 Oct. 2018, www.sierraclub.org/sierra/fungus-eats-polyurethane-Aspergillus-tubingensis-plastic.

Dufour, Fred. “A Whopping 91% of Plastic Isn't Recycled.” *National Geographic*, 20 Dec. 2018, www.nationalgeographic.com/news/2017/07/plastic-produced-recycling-waste-ocean-trash-debris-environment/.

Joyce, Christopher. “Plastic Has A Big Carbon Footprint - But That Isn't The Whole Story.” *NPR*, NPR, 9 July 2019, www.npr.org/2019/07/09/735848489/plastic-has-a-big-carbon-footprint-but-that-isnt-the-whole-story.

School, Rowena. “Why Do We Need Plastic Packaging?” *Why Do We Use Plastic Packaging?*, British Plastics Federation, 17 Feb. 2017,

www.bpf.co.uk/packaging/why-do-we-need-plastic-packaging.aspx.

“Plastic-Busting Fungi May Help Tackle Pollution, Climate Change: UN Environment | UN News.” *United Nations*, United Nations, news.un.org/en/story/2018/10/1024512.

Madaan, Sonia. “Plastic Waste: Environmental Effects of Plastic Pollution.” *Earth Eclipse*, 18 July 2017, www.earthecclipse.com/environment/environmental-effects-plastic-pollution.html.

Rogers, Kara. “Microplastics.” *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 22 Apr. 2019, www.britannica.com/technology/microplastic#ref341997.

“Single-Use Plastics.” *YourSay ACT*, www.yoursay.act.gov.au/single-use-plastics.

<https://conservingnow.com/plastic-bag-consumption-facts/>

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