

Environment Commission

Tackling the Global Plastic Waste Crisis



Forum	Environmental Commission
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Introduction

The entire world is at peril due to the accelerated accumulation of plastic waste products in the environment. Aside from the fact that as a type of pollution it disrupts wildlife habitats, wildlife wellbeing, the health of humans and animals alike, and a plethora of other environmental factors, plastic pollution is particularly dangerous given its widespread usage and its durability component. With collections of plastic waste that stretch over an indeterminate area of immense size, such as the Great Pacific Garbage Patch and a gyre of marine debris particles in the North Pacific Ocean, plastic pollution is manifesting itself in very dangerous ways, transcending international relations and borders and becoming an issue evidently requiring international technological and political cooperation in order to obtain a solution.



Tang, Victoria. "Cleaning of the Pacific Garbage Patch." *The Quill*, mkquill.com/976/world-news/cleaning-of-the-pacific-garbage-patch/.



Definition of Key Terms

Biobased

According to European Bioplastics: “The term ‘biobased’ means that the material or product is (partly) derived from biomass (plants). Biomass used for bioplastics stems from e.g. corn, sugarcane, or cellulose.”

Biodegradable

According to European Bioplastics: “Biodegradation is a chemical process during which microorganisms that are available in the environment convert materials into natural substances such as water, carbon dioxide, and compost (artificial additives are not needed). The process of biodegradation depends on the surrounding environmental conditions (e.g. location or temperature), on the material and on the application.”

Bioplastic

A plastic material is defined as a bioplastic if it is either biobased, biodegradable, or possesses both properties.

Gyre

Wind, tides, and differences in temperature and salinity drive ocean currents. The ocean churns up different types of currents, such as eddies, whirlpools, or deep ocean currents. Larger, sustained currents—the Gulf Stream, for example—go by proper names. Taken together, these larger and more permanent currents make up the systems of currents known as gyres. (refer to Figure I in Appendix/Appendices to see a map of the five main gyres)

Marine Debris

The NOAA (National Oceanic and Atmospheric Administration) defines Marine Debris as: “any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes.”

PCBs



According to OECD, “Polychlorinated biphenyls (PCBs) is a group of organic compounds used in the manufacture of plastics, as lubricants, and dielectric fluids in transformers, in protective coating for wood, metal and concrete, and in adhesives, wire coating and so forth.”

Pollution

According to the European Environment Agency, pollution is the introduction of substances or energy into the environment, resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems, and impair or interfere with amenities and other legitimate uses of the environment.

Recycle

According to Climate Change Guide, “*Recycling* refers to collecting a waste product and reprocessing it so that it can be consumed once again. Recycling can also be defined as returning a resource to a previous stage in its cyclic process. For example, recycling could entail collecting a large quantity of aluminum cans, melting them into aluminum and finally, to produce new cans or other aluminum products out of the renewed material.”

General Overview

311 million tonnes of plastic was produced globally in 2014. Although recently the world has seen a slight decrease in plastic pollution, with current production trends, this is unlikely to be sustained. Plastic is an extremely useful material from an industrial point of view, and the number of its applications is expected to increase as more new products and plastics are invented and developed to meet the demands of a growing population. Nations that are particularly at peril are developing and emerging countries, due to the fact that the sophistication of their waste management and mitigation systems and infrastructure may not be developing at a sufficient rate as to combat the increasing levels of plastic waste. According to the European Commission, “at the heart of the problem is one of plastic’s most valued properties: its durability. Combined with the throwaway culture that has grown up around plastic products, this means that we are using materials that are designed to last, but for short-term purposes.”. Plastic pollution is making its way into the environment at an alarming rate.

In order to understand the problem, it is important to understand that the extent of plastic pollution is notoriously difficult to measure. The aforementioned statement is especially



true for the marine environment where the constant movement of the ocean waters, both horizontally along the surface and vertically within the water column, results in extreme difficulty to paint an accurate picture of the data. Ever since the discovery of the Northern Pacific Garbage Patch (the largest accumulation of ocean plastic in the world, located between Hawaii and California), there has been increasing research into the gyres as areas of accumulation of plastic waste, as well as beaches and river estuaries. The methods used to measure and survey marine waste are numerous. According to the European Commission, “Several standardised surveillance guidelines have been developed, for example, those produced by the Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and the United Nations Environmental Programme (UNEP)”.

Plastic waste does not only pose a threat to the marine environment - plastic waste is also persistent on land. According to Our World In Data: “The first synthetic plastic — Bakelite — was produced in 1907, and is said to mark the beginning of the global plastics industry. However, rapid growth in global plastic production was not realised until the 1950s. Over the next 65 years, annual production of plastics increased nearly 200-fold to 381 million tonnes in 2015. For context, this is roughly equivalent to the mass of two-thirds of the world population” Although there are significantly less figures on measuring the plastic pollution, the global plastic waste crisis is demonstrated by the following data (2010):

- global primary production of plastic was 270 million tonnes;
- global plastic waste was 275 million tonnes (and can exceed annual primary production through wastage of plastic from prior years);
- plastic waste most at risk of entering the oceans is generated in coastal populations (within 50 kilometres of the coastline); in 2010 coastal plastic waste amounted to 99.5 million tonnes;
- only plastic waste which is improperly managed (mismanaged) is at significant risk of leakage to the environment; in 2010 this amounted to 31.9 million tonnes;
- of this, 8 million tonnes – 3% of global annual plastics waste – entered the ocean (through multiple outlets, including rivers);
- an estimated 10,000s to 100,000s tonnes of plastics are in the ocean surface waters (several orders of magnitude lower than ocean plastic inputs).



The global production of plastics in 2014 was 311 million tonnes. It has been estimated that in 2010 alone, between 4.8-12.7 million metric tons of plastic found their way into our oceans. Plastic debris and microplastics is transported by ocean currents across borders. It is found everywhere, even on the most remote shores of uninhabited islands, in the Arctic ice, the deep ocean and in a broad array of marine organisms. Whether due to poor waste and wastewater management, accidental losses that could have been prevented, or illegal dumping, the “leakage” of this debris into our oceans has serious environmental, social and economic consequences. It harms wildlife, safety of sea transport, fisheries, tourism, recreation, it threatens marine ecosystems and morally should be considered a common concern of mankind.

Microplastic particles are found in a large variety of marine organisms, including species we consume as seafood. The sparse knowledge on levels and effects does not indicate a health risk to humans now, but the uncertainty is high. The smallest plastic particles – the nanoplastics, are of even larger concern. They are so small that some can enter organs and body fluids of organisms, and due to their high surface/volume ratio they can carry larger amounts of environmental toxicants. Plastic debris breaks down very slowly in the marine environment, especially under cold and dark conditions. Levels of nanoplastics in the oceans, and how much of the plastic which is ultimately fully degraded, is not known.

More than 90% of the plastics that end up in our oceans are carried by 10 rivers alone, which are:

- Chang Jiang (Yangtze River) - 1,469,481 tons
- Indus - 164,332 tons
- Huang He (Yellow River) 124,249 tons
- Hai He - 91,858 tons
- Nile - 84,792 tons
- Meghna, Brahmaputra, Ganges - 72,845 tons
- Zhujiang (Pearl River) - 52,958 tons
- Amur - 38,267 tons
- Niger - 35,196 tons
- Mekong - 33,431 tons

As of 2018, as summarised by the World Environment Day 2018 Document from the United Nations Environment Programme, the global plastic waste crisis is demonstrated by the following data:



- 500 billion plastic bags used each year
- 13 million tonnes of plastic leak into the ocean each year
- 17 million barrels of oil used on plastic production each year
- 1 million plastic bottles bought every minute
- 100,000 marine animals killed by plastics each year
- 100 years for plastic to degrade in the environment
- 90% of bottled water found to contain plastic particles
- 83% of tap water found to contain plastic particles
- 50% of consumer plastics are single use
- 10% of all human-generated waste is plastic

While our knowledge of the impact of plastics in our oceans is incomplete, what we already know shows we should not wait before taking action.

Major Parties Involved

The plastic waste crisis mainly manifests itself in marine waste, therefore most action towards waste mitigation regarding the waste after it has been produced is being focused on managing marine waste. Coastal nations, especially nations in Southeast Asia, are majorly responsible for the dangerous increase in plastic infiltrating international oceans. The following nations are responsible for approximately 60% of all the plastic waste in the world's oceans:

- The People's Republic of China
- The Republic of the Philippines
- The Kingdom of Thailand
- The Socialist Republic of Vietnam

European Union (EU)

The EU identified action on plastics as a priority in the 2015 Circular Economy Plan. According to the EU website, "On 4 March 2019, the European Commission adopted a comprehensive report on the implementation of the Circular Economy Action Plan. The report presents the main achievements under the Action Plan and sketches out future challenges to shaping our economy and paving the way towards a climate-neutral, circular economy where pressure on natural and freshwater resources as well as ecosystems is minimised." The newly established and adopted strategies will change "the way plastics are designed, used, produced and recycled", and will contribute towards achievement of the Sustainable Development Goals.



Surfrider Foundation

According to their website: “Our model is to engage environmental experts to create solutions, unite local and national resources to protect the coast, and leverage our local chapter network’s knowledge with a national perspective.” They are a non-profit organisation, operating mainly in North America, South America, Europe and Japan, that is working to protect the world’s oceans by focusing on water quality, coastal ecosystems, beach access, as well as preservation of areas that are popular tourist spots. Their outstanding activist network and social media presence makes them effective.

Oceana

According to their website: “Unfortunately, the oceans are in trouble — scientists report that the amount of fish caught from the oceans began declining — for the first time in recorded history — just a few decades ago. Fortunately, we know how to fix things. Science-based fishery management — which establishes science-based catch limits, reduces bycatch and protects habitat — is helping the oceans rebound and recover where it is established. Oceana is dedicated to advocating for science-based fishery management and restoring the world’s oceans.” Founded in 2001 and based in Washington D.C. with offices all around the world, Oceana is the largest international advocacy organisation that is solely focused on ocean conservation. Therefore, they have a large role to play in managing the marine aspect of the plastic waste crisis.

5 Gyres

This is a non-profit organisation dedicated to the understanding of marine plastic waste and pollution, especially phenomena such as the Great Pacific Garbage Patch. “Through exploration, scientific research, education, and action the 5 Gyres Institute engages communities in systemic change and encourages corporate partners, policymakers, and the general public to reduce plastic pollution”.

Environmental Protection Agency (EPA)

The EPA mainly operates in the United States of America, aiming to protect human health and our environment. Their mission is to ensure that the American population is protected from pollution in their environment and workplace. The organisation further aims for the effective enforcement and implementation of federal laws to protect the environment and human health.



This organisation is representative of America and plays a key role in working with other member states to protect the global environment.

National Oceanic and Atmospheric Administration (NOAA)

This organisation plays several specific roles in society, the benefits of which span not only across the U.S. economy, but internationally. The National Ocean Service (NOS)'s focus is making sure that ocean and coastal areas are safe, healthy, and productive. Scientists, natural resource managers, and other specialists contribute to the work of NOAA by ensuring safe marine transportation efficiently, promoting and establishing innovative solutions to protect coastal communities, and aiding in the conservation of marine and coastal places.

Natural Resources Defense Council (NRDC)

The NRDC is an international non-profit environmental advocacy organisation, based in New York. They are currently developing three key strategies to reduce plastic waste pollution in the U.S. and across other member nations: "Holding plastic producers accountable, leading international action and reducing plastic pollution."

Timeline of Key Events

This is a timeline demonstrating key points in time in the international fight against the plastic waste crisis - not every single event is documented, only the most relevant ones.

Date	Description of event
1959	First warning labels are printed on plastic bags after the deaths of 80 infants were suffocated by plastic bags for dry cleaning.
1961	Industries effectively shift responsibility for such events to the consumer.
1975	The London Dumping Convention comes into force
1978	MARPOL Protocol is adopted
1990	(January) Maine bans single-use plastic bags at retail checkouts.
1992	Basel Convention comes into force
1997	<u>Great pacific garbage patch</u> : Algalita Marine Research Foundation starts to document what is referred to as the "Great Pacific Garbage Patch"



2001-2004	The process of the Stockholm convention entering into force and being adopted.
2006	London Protocol enters into force
2014-2016	United Nations Environmental Assembly - Resolutions 1 and 2
2018	(May 28) EU, UK and India propose plastic bans through relevant rules and societal policies.
2018	(July 1) Seattle becomes the first U.S. city to ban the use and sell of plastic straws and utensils
2018	(July 13) Major companies and corporations take aim at plastic straws, as a response to consumer pressure.
2018	(September 7) Giant trash collector sets course for the Great Pacific Garbage Patch, through The Ocean Cleanup.
2018	(October 12) President Trump signs bill to clean up ocean plastic waste, while condemning nations such as China and Japan.
2018	(October 26) The EU Parliament approves single-use plastic ban
2018	(October 29) 250 organisations responsible for 20% of the plastic packaging produced internationally commit to reducing waste and pollution through a massive global plastic partnership.
2019	International efforts from member nations, such as Canada and Peru, to restrict or completely ban the use of single-use plastics continues.

UN involvement, Relevant Resolutions, Treaties and Events

UN Involvement

United Nations Environment Programme (UNEP)

According to their website: “The United Nations Environment Programme (UN Environment) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. Our mission is to provide leadership and encourage partnership in caring for the environment by inspiring,



informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.”

Through documents such as “Single-use Plastics - A Roadmap to Sustainability”, this organisation is the leading UN party in combatting environmental issues such as the global plastic waste crisis.

Relevant UN Documents

Marine Plastic Debris and Microplastics, 27th June 2014 (Resolution 1 / 6)

In the United Nations Sustainable Development Conference outcome document, marine plastic waste is labelled as one of the major concerns as it adversely affects the health of oceans and marine biodiversity. Therefore, there is a call for action to achieve a significant reduction in marine plastic waste by 2025 to prevent further irreversible harm to the coastal and marine environment. The resolution at hand was hence adopted on the 27th of June 2014 as the main summary of actions to mitigate marine plastic waste and deal with the marine aspect of the global plastic waste crisis.

Oceans and the Law of the Sea, 8 March 2006 (A/RES/60/30)

This is one of the main resolutions following up on a series of other resolutions of the theme Oceans and the Law of the Sea, which is split into the following sections: Implementation of the Convention and related agreements and instruments, Capacity-building, Meeting of States Parties, Peaceful settlement of disputes, the Area, Effective functioning of the Authority of the Tribunal, and others out of which the most important is “Marine environment, marine resources, marine biodiversity and the protection of vulnerable marine ecosystems”.

Sustainable Fisheries, 2005 (A/60/L.33)

“Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments” This resolution is related to the resolutions on the Law of the Sea and develops actions related to sustainable fisheries and fishing practices.



Other Relevant UN Resolutions reaffirmed by Resolution 60/30 and adopted by the General Assembly

- Resolution A/RES/49/28 - Law of the Sea
(<https://www.un.org/documents/ga/res/49/a49r028.htm>)
- Resolution A/RES/52/26 - Oceans and the Law of the Sea
(<https://www.un.org/ga/documents/gares52/res5226.htm>)
- Resolution A/RES/54/33 - Results of the review by the Commission on Sustainable Development of the sectoral theme of "Oceans and seas": international coordination and cooperation (<https://undocs.org/en/A/RES/54/33>)
- Resolution A/RES/57/141 - Oceans and the Law of the Sea
(https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_57_141.pdf)
- Resolution A/RES/58/240 - Oceans and the Law of the Sea
(https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_58_240.pdf)
- Resolution A/RES/59/24 - Oceans and the Law of the Sea
(https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_59_24.pdf)

Treaties and Events

- **London Protocol:** according to the International Maritime Organisation: "The "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972", the "London Convention" for short, is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. Currently, 87 States are Parties to this Convention."
- **Stockholm Convention:** the Stockholm Convention on Persistent Organic Pollutants (POPs) is an international environmental treaty which was signed in 2001 and came into force in May 2004. It aims to eliminate or effectively restrict the production and use of POPs around the world.



- **Basel Convention:** The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, shortened to the Basel Convention, is an international waste mitigation and management treaty designed to reduce and control the movements of hazardous waste between nations. It was especially focused on prevention of transfer of such waste from developed to less developed countries (LDCs). Plastic was added to the Basel Convention on the 10th of May 2019.

Previous Attempts to solve the Issue

An issue with previous attempts to solve the plastic waste crisis appears to be the lack of action aimed at resolving plastic waste on land, and an abundance of measures to manage marine plastic waste which fall apart due to weak compliance policies and economic dependence on funds generated through unsustainable production.

WWF - Solving Plastic Pollution Through Accountability

The World Wide Fund for Nature (WWF) published a 2019 document titled “Solving Plastic Pollution Through Accountability” in which it calls for governments to:

- Agree to a legally binding international treaty,
- Establish national targets for plastic reduction,
- Deploy appropriate policy instruments,
- Collaborate with industries and civil society groups,
- Invest in ecologically sound waste management systems,
- Legislate effective extended producer responsibility,
- Implement sufficient monitoring and compliance measures,
- Work at appropriate subnational levels and invest in city approaches.

The document involves multiple calls for actions, through due to the fact that it is recent, its success cannot be determined accurately.

Possible Solutions

“Our World In Data” summarises the optimal course of action within the following bullet points:



- **Plastic pollution is having a negative impact on our oceans and wildlife health. There have been many instances of marine impacts.**

Therefore, action supporting the conservation and overall improvement of environmental wellbeing with regards to processes and events we can control should be encouraged.

- **High-income countries tend to generate more plastic waste per person.**

Clauses that focus on controlling production that involves plastic pollutants would be enhanced if markers of nations' wealth are taken into consideration. Actions towards specifically controlling plastic production in high-income countries, such as increased taxation per unit of plastic waste, should be encouraged.

- **However, how plastic waste is managed determines its risk of entering the ocean. High-income countries have very effective waste management systems; mismanaged waste (and ocean inputs) are therefore low. Poor waste management across many middle- and low-income countries means they dominate the sources of global ocean plastic pollution.**

Clauses addressing the establishment of new and/or improved waste mitigation systems, taking into account nations' GDP and other markers of their wealth, should be welcome. The global plastic waste crisis has a higher chance of being tackled if common guidelines are set, and if strategies are undertaken by which the plastic released into the environment decreases in amount.

- **This makes the improvement of waste management systems across the world critical to addressing plastic pollution.**

Waste management systems should be understood as not only managing the waste that comes out, but also ensuring that the amount of waste that comes out of the production line is minimal in the first place. This is achieved through design innovation and considering the environment as a priority when producing at any scale, which would be established through common guidelines and legislation, as well as financial instruments such as taxation.

- **Overall, approximately 80 percent of ocean plastics come from land-based sources, and 20 percent from marine. But, in particular regions, marine sources can dominate. More than half of plastics in the Great Pacific Garbage Patch (GPGP) come from fishing nets, ropes and lines.**

Therefore, a large portion of the potential solutions is concerned with legislation and regulation of various industries through fiscal and monetary policies and the intervention of governments and NGOs. It is of paramount importance that clauses on the issue at hand aim to regulate



and change the ways in which the fishing industry, and all other industries, conduct themselves.

- **It's also important to note that plastic is a unique material with many benefits: it's cheap, versatile, lightweight, and resistant. This makes it a valuable material for many functions. It can also provide environmental benefits through certain supply chains: it plays a critical role in maintaining food quality, safety and preventing waste. The trade-offs between plastics and substitutes (or complete bans) are therefore complex and could create negative knock-on environmental impacts.**

This means that clauses should aim to repurpose plastics instead of removing them from production altogether - through innovative production strategies, as well as other measures, plastic can be employed in different ways so that the waste crisis is managed while the potential of plastic as a material is still maximised sustainably.

Furthermore, a 2015 report by the McKinsey Center for Business and the Environment outlined optimal strategies to deal with the plastic waste crisis:

1. Closing leakage points within collection systems through the optimisation of transport systems and infrastructure to eliminate illegal dumping. Also, closing or improving dump sites that are located near waterways.
2. Increasing waste collection rates by expanding collection services, through investment in new technology, innovative routes and support of companies providing such services sustainably.
3. Using a variety of waste-to-fuel strategies or waste-to-energy strategies to treat waste in areas with high waste densities, in alignment with local priorities and needs, as well as with respect to local traditions and cultural customs.
4. Manually sorting plastic waste of high value and converting the majority of the remainder into refuse-derived fuel (RDF). This would target areas with low waste densities, and the fuel would be used in cement industries - it could replace 3% of total coal consumption.

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Appendix or Appendices



Figure 1:

