Committee: Legal Committee (GA6)

Topic: Examining the regulatory frameworks for waste management in the oceans

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Topic Introduction

Over 5.25 trillion pieces of plastic can be found in our oceans[1]. Plastic is found at the centre of waste in our oceans, due to its popularity as a single-use item in our society. Over 141 million tonnes of plastic packaging are produced each year[2] and a big part of this ends up as waste and poses a threat to marine life, ecosystems and even us humans. 220 million tonnes of plastic waste are expected to be generated in 2024[3]. A prime example of the scale of plastic waste in our oceans is the Great Pacific Garbage Patch, a concentrated area of marine debris that's approximately 3 times the size of France (or 1.6 million square kilometres)[4]. The main role of the United Nations Environment Programme (UNEP) is to help provide the regulatory framework for waste management; the role of the International Maritime Organisation (IMO) is to address issues associated with waste management in relation to the shipping industry. Business owners need to ensure that their products are recyclable or/and that they use the least amount of plastic (and other core waste products) possible. Policymakers' role is to enforce and create policies relating to regulating plastic and sewage waste as well as strengthen already existing policies. NGOs play an essential role in recycling and cleaning up our shores. Ocean waste negatively affects wildlife due to ingestion (by fish), which causes a blockage in their digestive system. Through this, our food supply is also contaminated through consumption of these fish. Harmful chemicals (like PFAs) are also

[1] Parker, Laura. "Ocean Trash: 5.25 Trillion Pieces and Counting, but Big Questions Remain." *Education.nationalgeographic.org*, 27 Nov. 2023, education.nationalgeographic.org/resource/ocean-trash-525-trillion-pieces-and-counting-big-questions-remain/3rd-grade/.

[2] https://www.wrap.ngo/taking-action/plastic-packaging

[3] "2024 Report: New Perspective on Global Plastic Pollution!" *Plastic Overshoot Day*, plasticovershoot.earth/report-2024/.

[4] https://theoceancleanup.com/great-pacific-garbage-patch/

released into the ocean through plastic and sewage waste, which harms reefs, wildlife and even humans. Plastic on our shores (and in the ocean) usually creates an aesthetically displeasing image and even prohibits swimming in the seas, which leads to major tourism losses in countries that depend on it. Fisheries are also negatively affected by ocean waste due to the fact that, in some areas, leading to significant profit loss. In order for change to become permanent and the collapse of ecosystems to be avoided, legal measures must be taken and enforced in order to manage waste.

Definition of key concepts

Waste

"Unwanted or unusable material, substances, or by-products."[5]

Waste management

"The total supervision of waste production, handling, processing, storage, and transport from its point of generation to its final acceptable disposal."[6]

Microplastics

"Microplastics are small plastic pieces less than five millimetres long which can be harmful to our ocean and aquatic life."[7]

Microplastics

"A biological community of interacting organisms and their physical environment."[8]

Marine Debris

"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."[9]

[5] https://languages.oup.com/google-dictionary-en
[6] https://leap.unep.org/en/knowledge/glossary/waste-management
[7] https://oceanservice.noaa.gov/facts/microplastics.html
[8] https://languages.oup.com/google-dictionary-en
[9] https://oceanservice.noaa.gov/facts/marinedebris.html

Persistent Organic Pollutants

"Persistent organic pollutants (POPs) are hazardous chemicals that threaten human health and the planet's ecosystems. POPs remain intact for a long time, widely distributed throughout the environment, accumulate and magnify in living organisms through the food chain, and are toxic to both humans and wildlife."[10]

Bioaccumulation

"The accumulation over time of a substance and especially a contaminant (such as a pesticide or heavy metal) in a living organism."[11]

Biomagnification

"The process by which a compound (such as a pollutant or pesticide) increases its concentration in the tissues of organisms as it travels up the food chain."[12]

Background Information

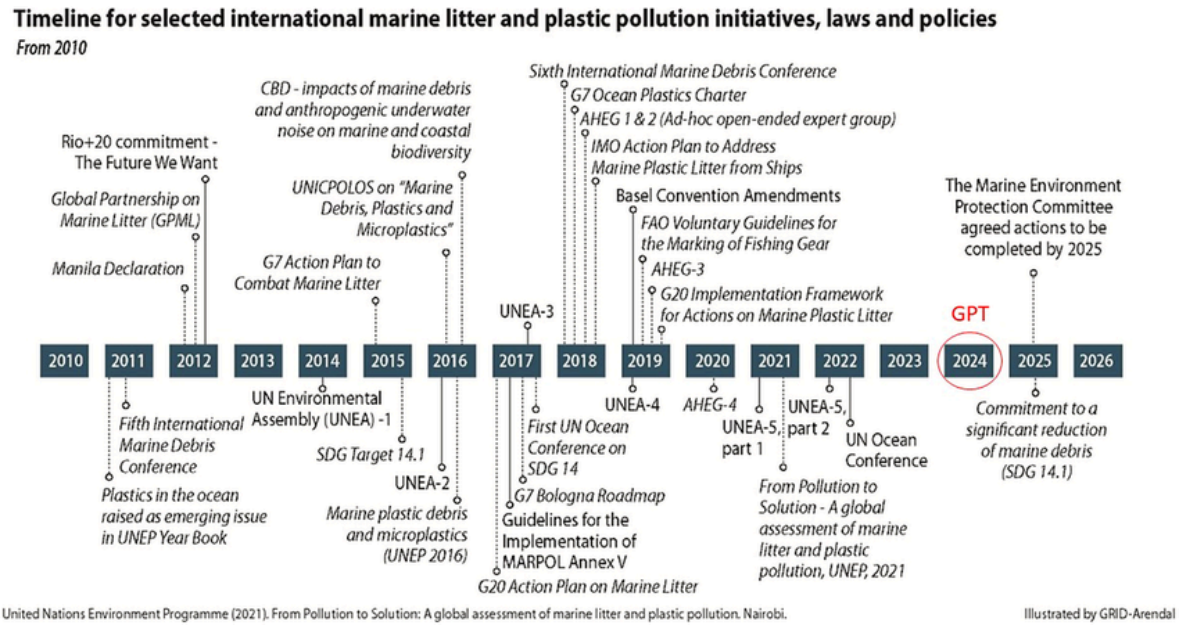
Overview of Ocean Waste

Over 80% of ocean waste is plastic[13] and 8-10 million metric tons of plastic annually end up in the oceans. The issue with plastic waste is that it takes years to fully disintegrate (500-1000) and even then, it becomes microplastics, meaning that its effect is long term and constantly active. There are

[10] https://www.unep.org/topics/chemicals-and-pollution-action/pollution-and-health/persistent-organic-pollutants-pops/why
[11] https://www.merriam-webster.com/dictionary/bioaccumulation
[12] https://www.merriam-webster.com/dictionary/biomagnification
[13] https://oceanliteracy.unesco.org/plastic-pollution-ocean/

50-75 trillion pieces of plastic and microplastics in our seas and oceans right now.[14] Harmful chemicals tend to also be a waste product of a lot of industries.

The major contributors of plastic tend to be household items such as plastic bags, bottles and food containers,because they are not recycled properly. Fishing gears are also amongst the major contributors of plastic. Fertilisers tend to be run-off products from agricultural processes. Fertilisers create 'dead zones'[15]. Overall, agriculture tends to be a major contributor to ocean waste, contributing to a lot of bacteria in the oceans (from agricultural waste) and herbicides and insecticides. Other important waste products include sediment (from construction)[16], oil and, in general, grease, tend to be amongst the waste products contributed by energy companies.



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[14] https://oceanliteracy.unesco.org/plastic-pollution-ocean/

[15] "Dead zones begin to form when excess nutrients, primarily nitrogen and phosphorus, enter coastal waters and help fertilise blooms of algae."
https://www.vims.edu/research/topics/dead_zones/formation/

[16] It is very rarely managed and it is very hard to recycle it

[17] Maes, Thomas, et al. "A Little Less Conversation: How Existing Governance Can Strengthen the Future Global Plastics Treaty." *Cambridge Prisms Plastics*, vol. 1, 1 Jan. 2023, https://doi.org/10.1017/plc.2023.22. Accessed 22 Jan. 2024.

The image above shows all the laws, policies and initiatives enacted from 2010 to the present as well as those that are going to be enacted until 2026, relating to managing marine debris and pollution. The image is from the UNEP 2021. The reason why 2024 is circled is due to the fact that it is our current year.

Case study: The Great Pacific Garbage Patch

The Great Pacific Garbage Patch is a large collection of marine debris found in the sea between California and Hawaii in the North Pacific Ocean. It is an accumulation of plastics, microplastics and other waste products which has grown to over 1.6 sq km. It is part of a gyre[18]. Plastic waste is not only found on the surface of the ocean in the GPGP but also on the seafloor beneath it. The debris from this impacts wildlife in the North Pacific region and it blocks the sunlight from getting to phytoplankton, an organism crucial to our planet's survival. For a more in depth look at the Great Pacific Garbage Patch visit:
https://education.nationalgeographic.org/resource/great-pacific-garbage-patch/

Impact of Ocean Waste

Environmental Impact

A lot of marine animals tend to ingest plastics, which causes them to 'bloat' and thus not eat nutrients they need, leading to starvation. It can also cause blockages. Animals also tend to get entangled in fishing gear (or 'ghost nets'). Chemicals from sewage, agricultural and industrial waste deplete the ocean of oxygen and create 'Dead Zones' (i.e in the Gulf of Mexico, annually) [19]. Pollutants like crude oil (from oil spills), pesticides, POPs and petroleum damage the local ecosystems and cause issues to the body systems of marine life. The harmful chemicals thus directly enter the food chain in a process known as biomagnification.

Impact on Health

[18] "a large system of swirling ocean currents" https://oceanservice.noaa.gov/facts/gyre.html
[19] The sea can recover from dead zones if the pollutant is removed

Humans can (and do) ingest toxic pollutants through sea-food, which can cause hormonal, reproductive and renal issues as well as issues to one's nervous system. A lot of materials in plastic are found to be carcinogenic and plastic has currently been found in human placentas and blood.

Economic Impact

Marine debris and waste reduces the income of fisheries. It also keeps tourists away from beaches which leads to a lot of profit loss for countries and businesses. In 2018, the GDP saw a reduction of 7 billion USD globally.

Legislative and Regulatory Efforts

International

- International Convention for the Prevention of Pollution from Ships (MARPOL) - its main aim is to prevent ocean pollution from ships

https://www.imo.org/en/KnowledgeCentre/ConferencesMeetings/Pages/Marpol.aspx

- London Convention - it is the first protool (or convention) with an aim of protecting the marine world from pollution, by targeting waste dumping .

https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx

- Basel Convention - its aim is to protect both human and marine life from toxic waste

https://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx

National and Continental Scale

- National Plan of Action for the Prevention, Reduction and Management of Marine Litter (NPOA-ML) in the Philippines, enforced to control and manage waste in the local seas and oceans
- The EU has set up the Directive (EU) 2019/883 which requires all Member States to take steps to reduce pollution and monitor ships in all ports. [20]

[20] https://transport.ec.europa.eu/transport-modes/maritime/safety-and-environment/eu-actions-safety-and-environment-protection_en

Further reading:

Philippines National Plan of Action for the Prevention, Reduction, and Management of Marine Litter | SEA Knowledge Bank

Federal Actions to Address Marine Plastic Pollution | UCLA Law

Marine Litter Legislation: A Toolkit for Policymakers

Laws Protecting the Oceans - Oceana USA

Challenges in enforcement and compliance

Often, a lot of the measures that need to be taken to comply with the regulatory frameworks are costly and organisations and governments lack the proper funding to establish them. Regulations also tend to change over time and many companies fail to be updated, thus resulting in a violation of these regulations. It is also important to note that a lot of waste management methods can have a negative impact on the environment through negative carbon dioxide emissions.

Companies stay compliant with the regulations by educating staff members, constantly reviewing the framework and being more attentive in the segregation of waste. Governmental agencies (like the EPA) monitor the performance of these companies through inspections and sampling tests.

Here is how the EPA does it: Hazardous Waste Compliance Monitoring | US EPA

Technological and Scientific Developments

As technology improves, our means of waste management also improve with it. Here are some of the science-based processes used to, mainly, recycle: Advanced Recycling on the rise

Alternative materials have also come into prominence, like paper, bamboo, cork and seaweed. These materials are biodegradable, which means they don't have the same lasting effect of plastic and instead break down by themselves over a shorter period of time.

Additionally, since the 1960s, we have had an influx of research, tracking programs and studies by governmental or non governmental agencies. An example of this is NOAA's Marine Debris Monitoring and Assessment Project[21] and the International Coastal Clean Up.

For more information on both of these look into: Chapter: 6 Tracking and Monitoring Systems for Ocean Plastic Waste

Timeline of Events

1960s	Scientists first discover that more than 100 million tons of plastic were dumped into our oceans
1972	Congress enacts MRSA (see 'previous attempts')
16/01/1991	The largest oil spill, not accidental, by Saddam Hussein
31/12/1991	The Environmental Protection Agency (EPA) prohibits the dumping of sludge and industrial waste at sea
24/03/2006	London Protocol into effect
20/04/2010	Largest accidental oil spill (BP's Deepwater Horizon)

Further Information on the Topic:

- A framework for selecting and designing policies to reduce marine plastic pollution in developing countries - ScienceDirect
- Laws and regulations around waste management every business owner needs to know - RECYCLING magazine

[21] National Academies of Sciences, Engineering, and Medicine. 2022. Reckoning with the U.S. Role in Global Ocean Plastic Waste. Washington, DC: The National Academies Press. https://doi.org/10.17226/26132.

- Waste and recycling - European Commission
- Ocean Dumping Management Timeline | US EPA
- International Actions to Address Marine Litter | US EPA
- https://www.unep.org/news-and-stories/story/30-countries-helping-beatpollution-through-un-environments-cleanseas#:~:text=The%20countries%20–%20all%20members%20of,choking%20their%20beaches%20and%20reefs.
- BIOMAGNIFICATION BIO ACCUMULATION CONCENTRATION
- A Case Study of Biomagnification and its Effects on the Environment
- Why do persistent organic pollutants matter? | UNEP - UN Environment Programme

Major Countries/ Organisations and Alliances

USA

The USA is and has been a major contributor to ocean plastic waste but it is also one of the countries with the most detailed action system.

India

India is also a major contributor to plastic waste in the South Asian seas. In 2022, India accounted for 126.5 million kg of plastic waste in our oceans. Aside from this, India has also been the site of a lot of oil spills, which also contribute to ocean waste and make ocean waste management a lot more difficult.

China

China is globally acknowledged as one of the world's largest plastic polluters and producers. In 2019, was attributed ⅛ of the world's single-use plastic waste.

The Ocean Cleanup

The Ocean Cleanup is a non-profit organisation focused on developing innovative technologies to remove marine debris and clean up our oceans. They also aim to stop waste from entering the oceans in the first place.

Clean Ocean Action

Clean Ocean Action is an NGO with a goal to enhance the quality of American waters. They take action mainly focused on educating the public through hearings, books and press events.

Oceana

Oceana is an organisation centred around the protection of oceans and ocean conservation. They target ocean pollution

International Maritime Organisation (IMO)

The IMO is a specialised United Nations agency centred around the shipping industry and the deterrence of pollution and waste as a product of ships.

More links:

- https://nap.nationalacademies.org/resource/other/dels/plastics-in-the-ocean/ (on the USA)
- https://oceana.org/
- https://cleanoceanaction.org/about-coa
- https://theoceancleanup.com/about/

Previous attempts to solve the issue

Save Our Seas Initiative

It is an (ongoing) initiative with an aim to stop plastic before it enters our oceans through collaboration with businesses and federal governments to create a sort of “circular economy” and enhancing waste management mechanisms. Up to this point, the SOS Initiative has prevented plastic worth 6.5 million water bottles from entering our planet's waterways; has benefitted 9.2 million people worldwide by bettering air and water quality and has managed to give 18.5 million USD to recycling and waste management systems and mechanisms. So far the SOSI has had a positive impact

on both people and the environment and has been successful in collaborating with both the public and private sector to assign funding for waste management.

EPA Ocean Dumping Management Program

It is an act enforced by congress. Its aim was and is to limit the dumping of materials which negatively affect humans, animals and ecosystems in the oceans. It is also set to regulate the transportation of waste. The program is considered an overall success as it has stopped and regulated the dumping of waste. However, the program itself is based on assumptions about existing policies and some of these assumptions do not hold true.

Link to a clear evaluation:

https://www.epa.gov/sites/default/files/2015-09/documents/fs-measuring-ocean-dumping-management-program.pdf

More information: https://www.epa.gov/ocean-dumping/learn-about-ocean-dumping

Possible solutions

Enhance Regulations and Bans on Illegal Waste Shipments

In general set up the framework needed to ensure that waste shipments happen when there is no alternative that can be taken; there should be means to prove this. This is in order to promote local waste management rather than just transporting it somewhere else.

Ban all single-use plastics and add tax

Plastic-based items that cannot be used repeatedly (or more than once) should not be given out by businesses and should be charged more in places like supermarkets. This is because these items

cannot be recycled easily and mostly end up in the ocean, as waste, where they pose a continuous threat to wildlife and ecosystems. A tax should be placed on their sale as to discourage consumers from buying them and they should be banned by all businesses (restaurants, bars etc.) as to further minimise their use and accessibility within our society. The main exceptions to this are hospitals.

Extended Producer Responsibility (EPR) Schemes for Producers

Producers should take responsibility for the disposal and recycling of their products. Through this, producers should also make products with a large life-span (meaning products that last a long time) in order to slow down the rate at which items get thrown away (as waste). This can be achieved through the use of higher quality materials, testing of the product'ss endurance (and criteria it has to meet, which differ for each product) as well as providing a clear manual on how to clean and maintain a product.

Mandatory Recycling Facilities per city

There should be a minimum number of recycling facilities per person (in residential areas). This would be enforced in order to ensure that everyone has access to waste management services and recycling is a practice available to all. This is set to reduce the amount of waste dumped into the ocean and increase the amount of rubbish recycled. There should be a minimum of 1 recycling centre per (approximately) 8,500 people.[22] This does not include recycling bins, which should be as regular as standard bins.

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[22] This number was taken using Germnay, currently ranked as the top country in recycling; more specifically using the population of Bavaria and the amount of recycling centres it has (Bavaria has the most amount of recycling centres in Germany). Calculations were then done to find the amount of people per 1 recycling centre.

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