

Committee: Environment Sub-Commission 2

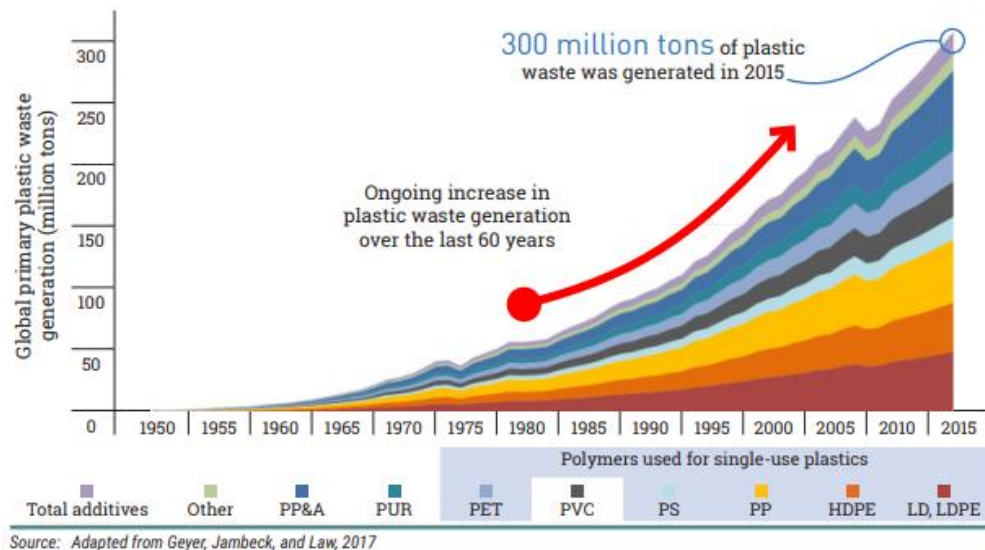
Issue: Single-use plastics as a roadmap for sustainability

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INTRODUCTION

Plastic is used by almost everyone in their daily lives. From the cup of the coffee they drink in the morning to the chair they sit in their office. The benefits of plastic are unquestionable. It is a cheap, lightweight and easy to make. However, its characteristics have caused problems over the past years. Since its very first production, in 1907, its manufacturing has outperformed that of almost every other material. Most of the plastic produced, is designed to be thrown away after one use and this is called a single-use plastic. As a result, this kind of plastic, specifically plastic packaging, accounts for 50% of the total plastic waste in the world. Most of the plastic thrown away is not biodegradable. The waste produced causes a variety of problems when leaked into the environment. Plastic bags can potentially inhibit waterways and thus contribute to natural disasters such as flood. By blocking the drains, they provide breeding places for mosquitoes and eventually increase the transmission of diseases such as malaria. In many cases, plastic bags, straws etc. end up floating on the ocean. These products are often ingested by turtles and dolphins which think that they are jelly fishes. Some toxic chemicals contained in plastics are transferred to the animal tissue and sooner or later to humans. More specifically, Styrofoam products contain carcinogenic chemicals which when ingested damage the nervous system, lungs and reproductive organs. In some counties, plastic waste is burned by a process called incineration. Incineration, however, releases harmful gases to the environment. Last but not least the economic damaged caused by plastic waste is of major importance.



Picture 1: Global primary plastics waste generation

DEFINITION OF KEY TERMS

Plastic

Plastic is a durable material made from organic polymers such as polyethylene, PCV, nylon etc, and has the ability of being shaped in a variety of forms and has a wide range of uses. There are two main categories of plastics: thermoplastics and thermosets. Thermoplastics, when exposed to heat, can be melted into liquid. If cooled, the material hardens and is able to be shaped into any other form of plastic. Thermosets have high-heat capacity as they form chemical bonds when heat is applied and they remain solid during the process.¹

Single-use plastic

Single-use plastic, also known as disposable plastic, include all items such as packaging, straws, water bottles, bottle caps etc, that are intended to be used only once before they eventually get thrown away or be recycled.²

Sustainability

Sustainable development is a kind of development that satisfies the needs of the modern society without risking the ability of the future generations to meet their needs.³

¹ Rodriguez, Ferdinand. "Plastic." Encyclopædia Britannica, Encyclopædia Britannica, Inc., 26 Dec. 2018, www.britannica.com/science/plastic.

² "What Is Single Use Plastic?" Plastic Free Challenge, www.plasticfreechallenge.org/what-is-single-use-plastic.

³ Hauff, Volker. Our Common Future. Oxford University Press, 1987, Our Common Future.

Foamed plastics

Also referred to by the brand name Styrofoam, is the material used to produce food containers as its characteristics consist of rigidity and insulation properties.⁴

Levy

The amount of money that someone pays to the government or an organization. Tax is an example of levy posed by governments.⁵

Marine debris

Marine debris is defined as any solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed or abandoned into the ocean, rivers, lakes etc.⁶

Mismanaged waste

Mismanaged waste is material which has a high possibility of entering the ocean via wind or tidal transport, or carried to coastlines from local waterways. It is the sum of materials which is improperly disposed.⁷

BACKGROUND INFORMATION

Types of plastic and uses

Plastic comes in all forms, bottles, bags, wrapping etc. In most plastic product there is a triangle from arrows with a number on it, indicating the type of plastic it is made of.

The 7 types of plastic include:







1. Polyethylene Terephthalate (PET)
2. High-Density Polyethylene (HDPE)
3. Polyvinyl Chloride (PVC)
4. Low-Density Polyethylene (LDPE)
5. Polypropylene (PP)
6. Polystyrene (PS)
7. Other (BPA, Polycarbonate and LEXAN)

⁴ United Nations Environment Programme, 2018, SINGLE-USE PLASTICS A Roadmap for Sustainability.

⁵ "LEVY | Meaning in the Cambridge English Dictionary." Cambridge Dictionary, dictionary.cambridge.org/dictionary/english/levy.

⁶ US Department of Commerce, and National Oceanic and Atmospheric Administration. "What Is Marine Debris?" NOAA's National Ocean Service, 14 Nov. 2008, oceanservice.noaa.gov/facts/marinedebris.html.

⁷ Ritchie, Hannah, and Max Roser. "Plastic Pollution." Our World in Data, 1 Sept. 2018, ourworldindata.org/plastic-pollution.

						
PETE	HDPE	PVC	LDPE	PP	PS	OTHER
polyethylene terephthalate	high-density polyethylene	polyvinyl chloride	low-density polyethylene	polypropylene	polystyrene	other plastics, including acrylic, polycarbonate, polyactic fibers, nylon, fiberglass
soft drink bottles, mineral water, fruit juice container, cooking oil	milk jugs, cleaning agents, laundry detergents, bleaching agents, shampoo bottles, washing and shower soaps	trays for sweets, fruit, plastic packing (bubble foil) and food foils to wrap the foodstuff	crushed bottles, shopping bags, highly-resistant sacks and most of the wrappings	furniture, consumers, luggage, toys as well as bumpers, lining and external borders of the cars	toys, hard packing, refrigerator trays, cosmetic bags, costume jewellery, CD cases, vending cups	

Picture 2: Types of plastic

1. Polyethylene Terephthalate (PET) is the most commonly produced and used type of plastic in the world and it found in most water bottles and some packaging. PET plastic is recyclable. PET plastic has high heat capacity, is clear and hard and has an excellent solvent resistant.
2. High-Density Polyethylene (HDPE) is a stiff plastic used in more robust packaging like detergent and oil bottles. It is also used in toys and some plastic bags. It consists of the most frequently recycled plastic and is considered as one of the safest types of plastic. Some of its properties are its excellent chemical resistance and high-heat capacity. Therefore it is used in picnic tables, trash bins, park benches and other products which require durability and weather-resistance. Products are reusable and recyclable.
3. Polyvinyl Chloride (PVC) is soft and flexible and is used to make wrapping, toys and more. It is often used for insulation of electrical wires and plumbing in hoses. It is generally impermeable to sunlight and weather and so used to make things such as window frames. Although its uses, PVC contain numerous toxins and only 1% of it, is recycled.
4. Low-Density Polyethylene (LDPE) is often found in plastic wraps, some bags, flexible bottles, wire applications and some plastic tops. It is considered less toxic than other types of plastic. It is not always recyclable and products made from recyclable LDPE are not as rigid and hard as those from recycled HDPE.
5. Polypropylene (PP) plastic is hard, but flexible. Since it has heat-resistance qualities it functions as a barrier against moisture, grease and chemicals. PP is used in most plastic bottle tops, yogurt containers, potato chip bags and straws. PP is recyclable and the end products can form battery cases, bins and trays.
6. Polystyrene (PS) is used in packaging under the trade name "Styrofoam". It is an inexpensive and easily-formed plastic which is used in soft drink lids, plastic cutlery and test tubes. Its structure is weak and breaks up easily. It may leak carcinogen chemicals in food products. It is not recyclable and thus is recommended to be reused.

7. Other (BPA, Polycarbonate and LEXAN)

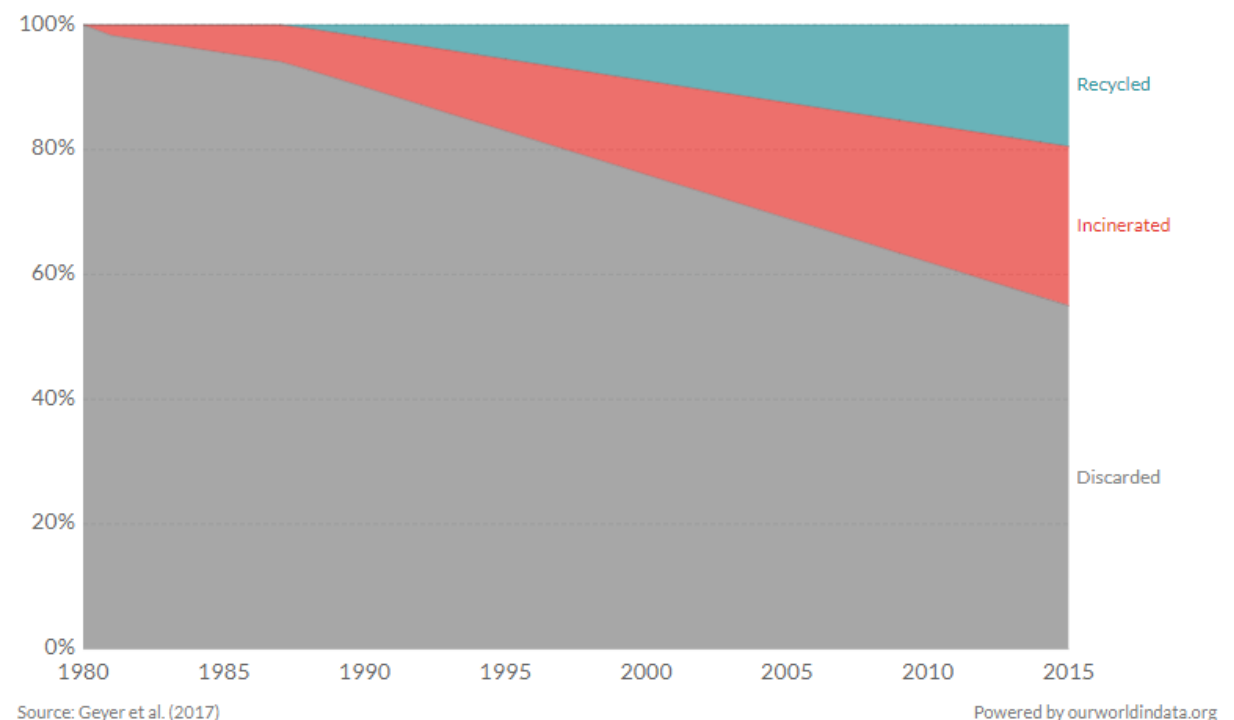
Plastic pollution

The origin of this problem is the cumulative production of plastic. In 1950 the global production of plastic was at 2 million tonnes per year. However, since then the annual production seems to be increased by 200-fold, reaching 381 million tonnes in 2015.⁸ It must be noted though, that there was a short downturn between 2009 and 2010 but this was just the result of the 2008 global financial crisis.

The major environmental problem with plastics is their future after disposal. Most of them end up floating in the oceans or being eaten by wildlife.

Beginning at 1980 for incineration, and 1990 for recycling, rates have shown an increase on average by 0.7% per annum. As shown in **Picture 3**, in 2015, approximately 55% of global plastic waste was discarded, 25% was incinerated and 20% was recycled.

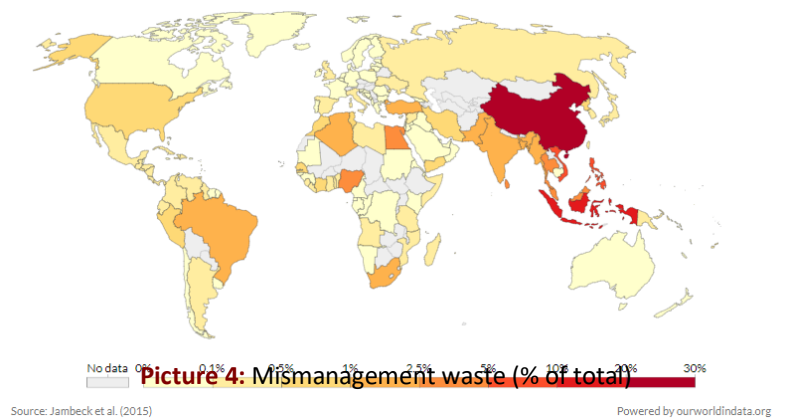
Estimates, based on extrapolation of historical trends, have shown that by 2050 incineration rates will increase to 50%, recycling to 44% and discretion will fall to 6%. Although this sets a hope for the future, it does not represent solid projections due to the fact that they are based on simplistic extrapolation of historic trends.



Picture 3: Global plastic waste by disposal

⁸ Ritchie, Hannah, and Max Roser. "Plastic Pollution." Our World in Data, 1 Sept. 2018, ourworldindata.org/plastic-pollution.

As seen in **Picture 4**, the strongest geographical clustering of mismanaged plastic waste exists in the continent of Asia. China seems to be the biggest contributor with a share of mismanaged waste of 28% of the total in the world. China is followed by Indonesia with 10%, and 6% from Philippines and Vietnam. Those countries are followed by Thailand (3.2%), Egypt (3%), Nigeria (2.7%) and South Africa (2%).

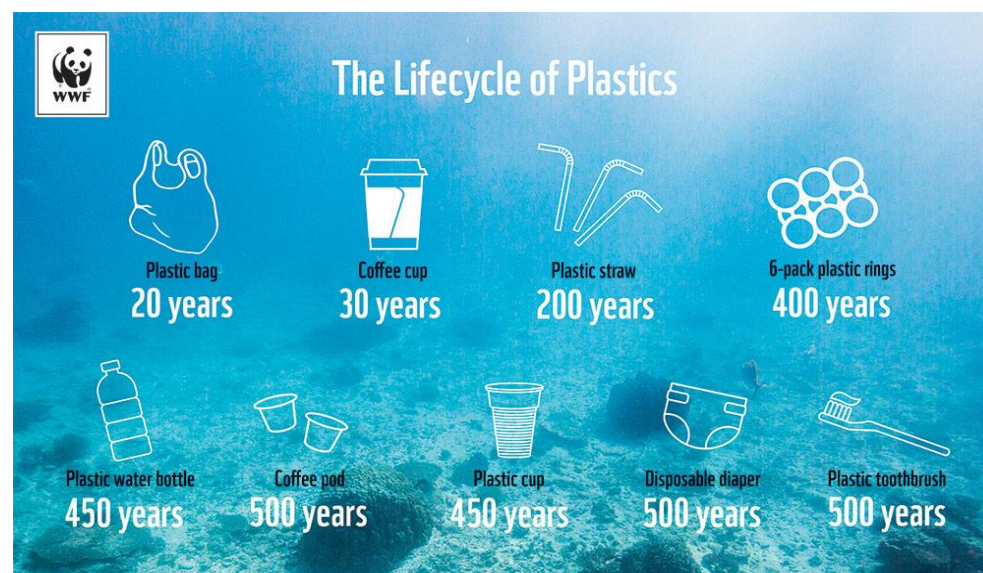


At the same time (2010), countries in Europe and North America, had relatively high rates of plastic production, but they improved the methods of waste management and their contribution to mismanaged waste was by far lower.

Impact on the environment

Plastic is made from non-renewable resources such as gas, crude oil and coal. According to the environmental organization “Clean Up Australia”, enough petroleum to power a single car for 1 kilometer goes into the production of just less than 10 plastic bags. It is really important to consider all the precious resources and energy that goes into the generation of plastic.

Another factor we need to take into account is the huge period of time that single-use plastics take to break down.



Picture 5: The lifecycle of plastics

It can vary from 20 to 1000 years. That’s a very long time polluting the environment, where not only it is an unpleasant picture, but it can also harm animals. Human actions are

responsible for a significant decline of the world's biodiversity. The threat to marine life comes in a plethora of forms such as overexploitation, harvesting, land reclamation and global climate change.

Recycling plastic

At the present time, only PET, HDPE and PVC products can be recycled. PS, PP and LDPE are not recycled because these materials get trapped in the sorting equipment in recycling services causing it to break or stop. Products such as lids and bottle tops cannot be recycled.

The process of plastic recycling involves the collection, arrangement, slicing, washing, melting and pelletizing of products. The actual process, however, varies based on the type of plastic. Most recycling services use the following 2 steps:

1. Sorting plastics automatically or even with manual sort as a way of ensuring that all contaminants are removed from the plastic waste stream
2. Melting down plastics into a new shape or cutting into small pieces and then melting down before finally processed.

MAJOR COUNTRIES AND ORGANISATIONS INVOLVED

China

China is a country which has a big history with plastic. In 2013, it was reported as being the largest plastic producer. According to recent studies, China is responsible for approximately 28% of plastic being thrown away into oceans, with 48 million tons of plastic waste.⁹ Actually in 1999, the Chinese government posed a ban in the production and the use of all single-use plastic products but the ban was not effective until it got it to force in 2013. In order to limit the production and the consumption of plastic bags, in 2008, a national ban and levy entered into force. The government banned non-biodegradable plastic bags less than 25µ and established a levy for thicker ones. This act indirectly promoted the use of reusable bags, resulting in a 60-80% decrease of plastic bag use in supermarkets.

India

The consumption of plastics in India is expected to increase significantly during the next decades due to the increase in population and the economy's development. Plastic industry contributes remarkably to the country's economy. However, around 5.6 Mt of plastic waste is generated per year. Interestingly enough, 70% of it is being collected, and 30% is estimated to be thrown in the environment. In 2014, a campaign called "Swachh Bharat Abhiyan"¹⁰ (Clean India Mission) was launched by the Prime Minister, Narendra Modi, which

⁹ "Plastic Waste In China." Collective Responsibility, 31 Mar. 2018, www.coresponsibility.com/plastic-waste-in-china/.

¹⁰ "PMINDIA." Prime Minister of India Swachh Bharat Abhiyan Comments, www.pmindia.gov.in/en/major_initiatives/swachh-bharat-abhiyan/.

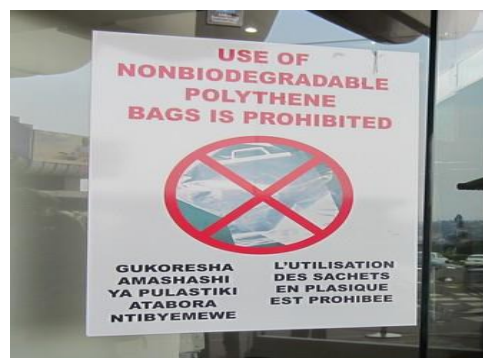
encouraged citizens to engage in the cleaning of roads, beaches etc. In 2016, India legislated national ban on non-compostable plastic bags under 50µ.



Picture 6: Mumbai beach in India

Rwanda

Rwanda is probably Africa's cleanest nation. In 2008, the government banned the manufacturing, use and sale of plastic bags. Until then, plastic was being burned in order to reduce waste, but at the same time released toxic pollutants in the air. Businesses transitioned to paper bags and promotion of alternatives such as reusable cotton bags. At the beginning the ban was not successful, as black markets in neighborhoods were emerged due to the overpricing of alternatives. Eventually, a new market for environmentally friendly bags was created. It has to be noted that violators can face fines for the offences. Since the establishment of the ban, Rwanda has a remarkable reduction of animal deaths, soil erosion, flooding, and malaria. It is reported that until 2020, Rwanda, will fully transform into a sustainable nation by becoming the world's first plastic free nation.¹¹



Picture 7: Sign in Kigali airport at Rwanda

¹¹ "Rwanda Plastic Bag Ban." Plastic Oceans International, 25 July 2018, plasticoceans.org/rwanda-plastic-bag-ban/.

European Union

Last year, 2018, the EU proposed some rules in order to combat the issue of single-use plastics found in Europe's beaches and seas. It promotes alternatives that are easily available and affordable and declares the ban of single-use plastic products from the market. The ban referred to certain products such as: plastic cotton buds, cutlery, plates, straws, drink stirrers and sticks for balloons. All Member States required reducing plastic containers and cups, by possibly adding levies on single-plastic products and promoting alternatives such as reusable cups or paper cups. Each plastic product should be having a label stating how the waste should be disposed, how much plastic is present in the product and its negative impact on the environment, as a means of raising awareness.¹²

Greenpeace

Greenpeace is an international non-governmental organization, established in 1971, and aimed to protect the environment in all possible ways. When it comes to plastic, one of their largest campaigns is a worldwide petition to encourage governmental action against single-use plastic. It states that drinking companies produce over 500 billion single-use plastic bottles per year. More specifically, Starbucks produces 4 billion coffee cups each year.¹³ The organization has created a database requesting for signatures in order to demand from the largest producers of single-use plastics, such as Coca-Cola, Nestle, Starbucks and McDonald's, to take responsibility of their actions and products.

TIMELINE OF EVENTS

Date	Description of Event
1907	The first synthetic plastic was produced, marking the beginning of the global plastics industry.
1989	Bangladesh drainage was poor due to plastic bag litter clogging drains which resulted to floods causing deaths.
1999	China originally banned the use and the production of single-plastic use but the ban was not effective until early the next decade.
2003	South Africa's Government introduced a national ban on single-use plastic bags combined with levy on retailers.
2008	China and Rwanda nationally banned the manufacturing and selling of single-use plastic products.
2009	The United Nations officially established "International Mother Earth Day", which is celebrated each year on 22 of April.

¹² "Single-Use Plastics." European Commission - European Commission, 1 Aug. 2018, ec.europa.eu/commission/news/single-use-plastics-2018-may-28_en.

¹³ "Preventing Plastic Pollution." Greenpeace USA, www.greenpeace.org/usa/oceans/preventing-plastic-pollution/.

2014	National ban on the production, use and sale of non-biodegradable plastic bags at Côte d'Ivoire.
2015	European Union stated that all Member States should ensure that by the end of 2019, the maximum number of lightweight bags (<50μ) consumed by one person per year is 90. Additionally, the goal of reducing 90 to 40 bags per person by the year 2025 was announced. Levy on consumer entered into force in the United Kingdom.
2015	Plastic packaging waste accounted for 47% of the plastic waste generated globally, with half of that appearing to come from Asia.
2016	India posed a ban on non-compostable plastic bags 23 cities in Indonesia announced levy on plastic bags which resulted in a 40% reduction in the number of bags used. In France, a national ban entered into force.
2017	In New Zealand, the Ministry of Environment decided to contribute to the fight against plastic pollution by pursuing a voluntary agreement. Officials encouraged supermarkets to charge or even ban single-use plastic bags. Fiji's national levy entered into force. Kenya nationally banned single-use plastics.
2018	EU announced regulations regarding single-use plastics.
2021	Costa Rica aims to become the first country in the world to ban all single-use plastics. Canada announced the plan of banning water bottles, bags and straws.

UN INVOLVEMENT: RELEVANT RESOLUTIONS, TREATIES AND EVENTS

- UN Convention on the Law of the Sea (1982) which focused on the establishment of new regime for the seas and oceans¹⁴
- Agreement relating to the implementation of part XI of the UN Convention on the Law of the Sea of 10 December 1982¹⁵
- 70/235 "Oceans and the law of the sea" resolution of the General Assembly emphasized the need of international cooperation and the implementation of the Convention¹⁶
- UNEP/EA.2/Res.11 on marine plastic litter and microplastics¹⁷

¹⁴ United Nations Convention on the Law of the Sea. UN, www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf.

¹⁵ Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982. UN, 1994, treaties.un.org/doc/Publication/UNTS/Volume%201836/volume-1836-I-31364-English.pdf.

¹⁶ "Oceans and the Law of the Sea." A/70/L.22 - E - A/70/L.22, undocs.org/A/70/L.22.

¹⁷ Marine Plastic Litter and Microplastics. United Nations Environment Assembly of the United Nations Environment Programme, 2016,

- “Single-use Plastics: A Roadmap for Sustainability” report by UN Environment Programme¹⁸

It examines the issue of plastic pollution and manages to tackle it by referring to governments, industries and individuals. The report also contains a 10-step roadmap for governments:

1. Identify the problem
2. Evaluate possible actions
3. Assess the impact
4. Engage stakeholders
5. Raise awareness
6. Promote alternatives
7. Incentivize industry
8. Ring-fence revenues
9. Enforce
10. Monitor and adjust policy

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

There have been several attempts on solving the issue at hand. There are 4 main ways every country is trying to contribute to that: ban of single-plastic products, setting levies on the consumer and the supplier, private-public agreements and promotion of alternatives. In October 2018, the European Parliament approved the ban on single-use plastics.¹⁹ These measures are expected to be applied in 2021. The idea was proposed by Frédérique Ries, and was strongly supported by the European Parliament with a clear majority of 571 to 53. It was announced that the consumption of single-use plastic items must be reduced by 25% in Member States by 2025.

wedocs.unep.org/bitstream/handle/20.500.11822/13444/UNEA%202%20Marine%20plastic%20litter%20and%20micro-plastics%20English.pdf?sequence=1&isAllowed=y.

¹⁸ “Single-Use Plastics.” European Commission - European Commission, 1 Aug. 2018, ec.europa.eu/commission/news/single-use-plastics-2018-may-28_en.

¹⁹ “Global Initiatives to Reduce Single-Use Plastics.” SGS, www.sgs.com/en/news/2019/01/global-initiatives-to-reduce-single-use-plastics.

Already at this time, more than 60 countries have introduced bans- partial and total- and levies to limit single-use plastic waste. The main focus of governments has been plastic bags and foamed plastic products.

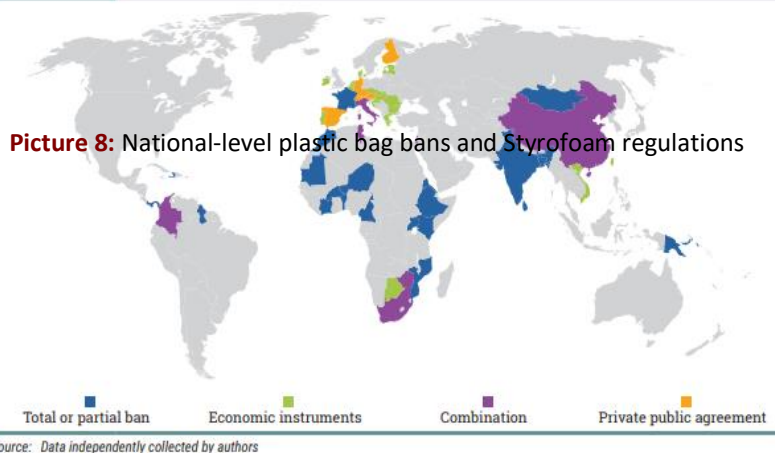
More than 250 organizations, representing 20% of all plastic produced globally, signed the “New Plastics Economy Global Commitment” in order to eliminate plastic waste and pollution. The initiation was originally presented by Ellen MacArthur at the “Our Ocean” conference in Bali on October 2018. UN Environment also collaborated with this project. The “Ellen MacArthur Foundation” works through education, business innovation and leadership to speed up the transition to a circular economy.

The New Plastics Economy initiative focuses on 5 reinforcing units:

1. Dialogue Mechanism: manages to bring together more than 40 companies and cities across the world to introduce collaborative and innovative projects and inform the other units
2. Global plastics protocol: provides a shared target for innovation in order to overcome existing disintegration and create effective markets
3. Innovation: Deploying innovations that can expand globally to redefine solutions
4. Evidence Base: effort to build an economic and scientific evidence base as a guideline for improvement and informing the global debate
5. Stakeholder engagement: engage stakeholders such as governments, NGOs and academics in the plan of a better plastics system²⁰

The Global Commitment is supported by the World Wide Fund for Nature (WWF) and has been approved by the World Economic Forum, The Consumer Goods Forum and 40 universities and institutions.

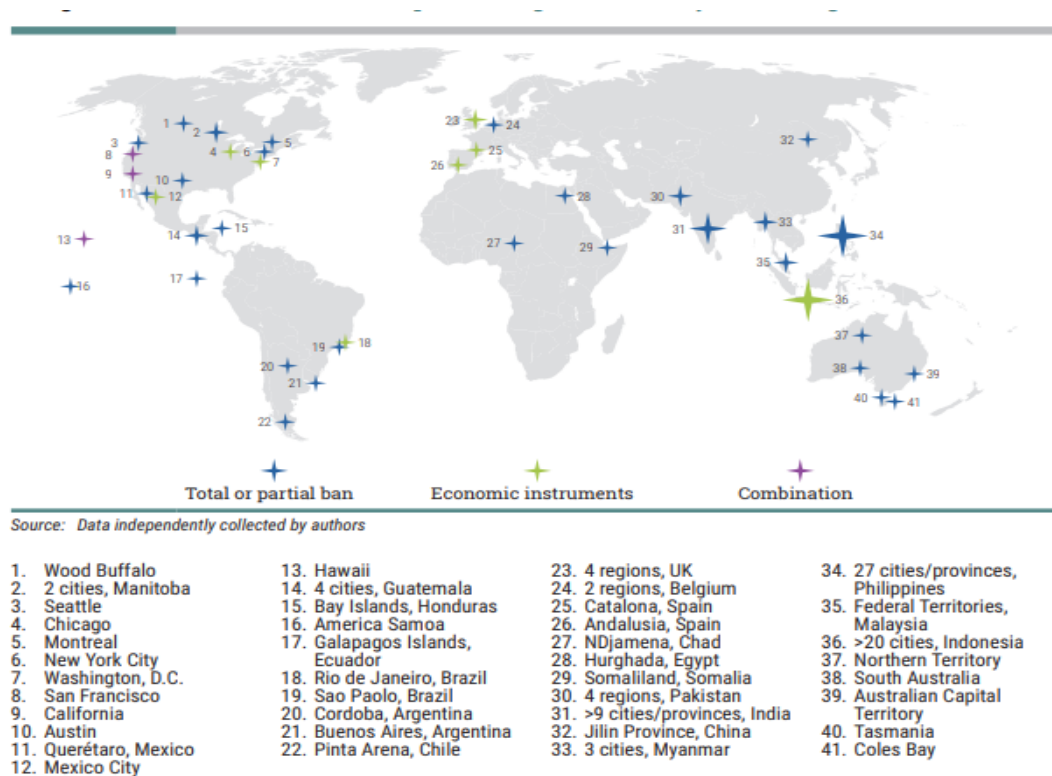
UN Environment leads the Global Partnership on Marine Litter and in September 2018 launched the Global Plastics Platform to support the international efforts against plastic pollution.



Picture 9: New Plastics Economy's building blocks

²⁰ “New Plastics Economy.” Ellen MacArthur Foundation, www.ellenmacarthurfoundation.org/our-work/activities/new-plastics-economy.

The International Convention for the Prevention of Pollution from Ships known as MARPOL (marine pollution) 73/78 is a treaty regulating disposal of waste produced by the normal operation of ships. The original Convention was signed on February 17 in 1973 but has not come into force yet. The current form of the Convention is a result of the combination of the 1973 Convention and 1978 Protocol. It was effective on 1983. MARPOL 73/78 aim is the minimization of pollution of the seas. It states that its object is “to preserve the marine environment through the complete elimination of pollution by oil and other harmful substances and the minimization of accidental discharge of such substances.



Picture 10: Sub-national level plastic bag bans and Styrofoam regulations

POSSIBLE SOLUTIONS

The most crucial cause of plastic pollution is the mishandling of the waste. Only a small percentage of single-use plastics are disposed properly and even smaller percentage is recycled. Public awareness is the key to solving the issue. Maintaining an informed and judgmental approach on plastic pollution by taking individual actions such as recycling and use of reusable products automatically make someone involved.

The ban and the setting of economic instruments such as levies are already expanding to more and more countries. It is an effective measure towards the reduction of plastic waste and it indirectly promotes the replacement of single-use plastics with more sustainable and environmental-friendly alternatives such as paper products or even reusable products.

Eco-friendly alternatives of plastic have been developed throughout the years and it seems that their promotion is increasing. Wooden cutlery is an alternative to single-use plastic cutlery. Every fast food restaurant provides the customers with plastic cutlery with their meal which ends up being thrown away after one use. Wooden cutlery is light and easy to carry around and can be reused many times. An alternative to plastic bottles is glass and metallic bottles which can surely be reused. Many companies already promote reusable caps, contributing to the decrease of plastic waste. Plastic bags have the highest percentage in plastic waste. Bringing your own bags to the supermarket or using canvas bags on your purchase is an effective measure against the increase of both local and global plastic waste. The promotion of metal straws is becoming more and more popular these days. It costs below 10 and it is easy to carry everywhere.

The management practices of plastic waste need to be improved and recycling should be promoted. All suppliers should take into account their contribution to the end product. Therefore, correct labeling should be considered a way of informing the consumers about plastic percentage in the product, recommended ways to dispose it and possible negative effects on the environment if correct disposal does not take place.

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