

If we defend

EDUCATION 

we sustain the

W ORLD



LET'S SAVE
THE OCEANS!

The balance of our planet depends on its oceans, especially now, as we must urgently address the devastating effects of climate change.

Our oceans contain 97% of the Earth's water and absorb approximately 30% of the carbon dioxide generated by human activities, thus reducing the impact of global warming. Seas and oceans are vital - not just from an environmental perspective, but also in terms of the economy and food security: the market value of marine resource and related industries comprises around 5% of the global GDP.

Despite their importance for our survival and that of our planet, **today, our oceans are a critically threatened ecosystem:** according to United Nations data, around 40% of the world's oceans are negatively affected by

the impact of human activities: pollution, acidification¹, the increase of the sea level and temperature, depletion of resources and loss of coastal habitats. Particularly worrying is the issue of **plastic pollution:** each km² of ocean contains an average of 13,000 pieces of plastic. Over the last 40 years, the presence of this kind of waste has multiplied 100 fold in the Pacific Ocean, where it has formed what is known as "**the Seventh Continent**", a vast mass of plastic waste floating in the northern area of this ocean, covering an area the size of a third of the United States. Although this example is extremely dire, it is far from an isolated case, as there are more bodies of plastic forming in other oceans on the planet.²

¹ A 26% increase has been registered in the acidification of our seas since the start of the industrial revolution.

² Currently five large areas of concentrated plastic waste have been identified on the sea's surface, also called plastic "soups": as well as that already mentioned in the Northern Pacific, there is another in the Southern Pacific, two in the Atlantic (North and South), and another in the Indian Ocean. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/como-llega-el-plastico-a-los-oceanos-y-que-sucedee-entonces/>



A PLASTIC WORLD

HUMANS HAVE PRODUCED SOME 8,300 MILLION TONNES OF PLASTIC SINCE ITS MASS PRODUCTION BEGAN IN THE 1950s³

The production of plastic materials has increased exponentially over the past 50 years, and in fact, in the last ten years we have produced more plastic than in the entire history of humanity⁴. Currently, over 400 million tonnes of plastic are produced each year⁵, and it has been envisaged that throughout 2020 we will reach 500 million tonnes, some 900% higher than in 1980⁶. Today,

half of the world's plastic is produced in Asia. China is the main producer (29% in 2016), followed by Europe (60 million tonnes, 19% in 2016) and North America (18%)⁷. This constant increase in plastic production is a response to the ever-growing demand for this material. Within Europe, over two thirds of plastic demand is concentrated in five countries, within which Spain stands in fourth position: Germany (24.5%), Italy (14.2%), France (9.6%), **Spain (7.7%)** and the United Kingdom (7.5%)⁸.

Plastic does not just generate non-biodegradable waste⁹, but its production also depends on the consumption of fossil fuels, a polluting non-renewable resource.

If plastic production continues to increase at the current rate, by 2050 the plastic industry will be responsible for 20% of the world's consumption of oil.

³ Weight equivalent to a billion elephants. Greenpeace.

<http://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/datos-sobre-la-produccion-de-plasticos/>

⁴ Greenpeace. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/datos-sobre-la-produccion-de-plasticos/>

⁵ UNEP (2018) SINGLE-USE PLASTICS: A roadmap for sustainability.

https://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic_sustainability.pdf?isAllowed=y&sequence=1

⁶ Greenpeace. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/datos-sobre-la-produccion-de-plasticos/>

⁷ Ibid.

⁸ Ibid.

⁹ Plastic bags can take up to 1,000 years to decompose.

Most plastic is used to make single-use products (such as packaging), which currently constitute almost half of the world's plastic waste: to get an idea, each year 500 billion plastic bottles are produced¹⁰. In Europe, the plastic demand for packaging was 39.9% in 2016¹¹. It is precisely the waste generated by this kind of packaging that is most commonly found in the environment and is particularly harmful to marine ecosystems¹². Another of the most used single-use plastic products are bags, of which between 1 and 5 billion units are used each year. If we focus on this latter figure, it means that approximately 10 million plastic bags are used each minute.

Plastic packaging comprises around half (47%) of all plastic waste around the world. In global terms, China is the country that generates the largest volume of this kind of plastic waste; however, if we look at the figures per capita (per person), the main generator of waste from plastic packaging is the United States, followed by Japan and the European Union¹³.

Specifically, in the case of plastic waste polluting the oceans, 16 of the 20 most polluting countries are average GDP countries whose economies are growing at a faster rate than the development of their waste management infrastructures¹⁴.



In Spain, each day 30 million containers and plastic bottles are thrown away, which go on to pollute our land, coast and sea environments¹⁵. Furthermore, more than half of the plastics consumed in Spain in 2016 ended up in rubbish dumps (and were therefore not recycled)¹⁶.



MAIN TYPES OF PLASTICS

Polyethylene (PE)

Plastic bottles, plastic sheets and films, containers (including bottles), cosmetic microbeads and abrasive products.

Polyester (PET)

Bottles, packaging, clothing, X-ray sheets, etc.

Polypropylene (PP)

Household electronic goods, garden furniture, vehicle components, etc.

Polyvinyl Chloride (PVC)

Tubes and accessories, valves, windows, etc.

Polystyrene (Styrofoam, XPS)

Construction materials, food packaging, etc.

¹⁰ Greenpeace. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/datos-sobre-la-produccion-de-plasticos/>

¹¹ Ibid.

¹² Ibid.

¹³ UNEP (2018) SINGLE-USE PLASTICS: A roadmap for sustainability.

¹⁴ Ibid.

¹⁵ Greenpeace.

<https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/como-llega-el-plastico-a-los-oceanos-y-que-sucedee-entonces/>

¹⁶ Greenpeace. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/datos-sobre-la-produccion-de-plasticos/>

PLASTICS: A THREAT TO THE OCEANS



THIS LEVEL OF PLASTIC CONSUMPTION HAS DEVASTATING CONSEQUENCES FOR ALL ECOSYSTEMS, BUT IN PARTICULAR FOR MARINE LIFE.

Each year, an average of 8 million tonnes of plastic reach our seas and oceans.¹⁷

According to Greenpeace, even if we dispose of our plastic waste correctly¹⁸, it can reach the ocean in various ways: taken by the wind and rain for example. Waste ends up in rivers, other water ways and drain systems, and from there it goes into the sea, no matter how far from the coast we are. Another source of plastic waste is dumping, either accidental or deliberate, from boats on the sea, from water treatment plants or wastewater plants. However, the **vast majority of this waste comes from land (80%), with the remaining 20% from marine activity.¹⁹**

This plastic can take tens, hundreds or even thousands²⁰ of years to degrade. Even so-called **“bio plastics”** made from renewable resources such as sugar cane or corn starch do not automatically biodegrade

in nature, especially in the oceans where degradation is slower than on land²¹. This is why plastic waste has been found in oceans around the entire world, even trapped in the Arctic ice. The plastic found on the sea surface is just a tiny part of the total (15% approximately), as the majority is underwater: plastic has been found at up to 10,000 metres of depth.²²

So-called **micro-plastics** are particularly harmful. These tiny fragments of plastic measuring less than 5 millimetres are either created through the breakdown of larger plastic items or because they have been produced that way (for example, micro-pearls found in hygiene and cleaning products).

In this case, these small plastic pieces reach the sea directly through drains, because they are so minuscule that they flow through water treatment filters²³. In total, it has been calculated that each year between 75,000 and

17 Greenpeace. <https://calculadoraplasticos.greenpeace.es/>

18 Greenpeace.

<https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/como-llega-el-plastico-a-los-oceanos-y-que-sucede-entonces/>

19 *Ibid.*

20 Although there is no conclusive data, studies indicate that plastic bags and polystyrene, also known as “Styrofoam” or “XPS”, can take thousands of years to decompose. Styrofoam is a solid foam resulting from the extrusion of polystyrene in the presence of foaming gas, used mainly as a thermal insulator. It is mainly used in construction (covers, cold stores, floors) and also to package foods such as eggs. UNEP (2018) SINGLE-USE PLASTICS: A roadmap for sustainability.

21 Degradation time depends on the type of plastic and the environmental conditions to which it is exposed (sunlight, oxygen, etc.). In the case of oceans, UV radiation from sunlight is the main element that decomposes plastic. The wave action accelerates this process, and therefore larger fragments are broken down into smaller pieces (micro-plastics). It is difficult to calculate how long plastic takes to break down in the ocean; once plastic is buried it goes beneath the water and is covered by organic or non-organic material (frequently in the marine environment), meaning its exposure to sunlight is minimal, and both temperature and oxygen levels are lower, slowing its degradation. Greenpeace.

<http://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/como-llega-el-plastico-a-los-oceanos-y-que-sucede-entonces>

22 *Ibid.*

23 Greenpeace. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/>

300,000 tonnes of micro-plastics end up in the environment in the EU²⁴. This plastic plague is close to home: it has been estimated that between 21% and 54% of the world's micro-plastic particles can be found in the Mediterranean basin.²⁵

The accumulation of plastics in the oceans generates numerous impacts that go beyond the environment: namely, human and economic.

Environmental impacts. One of the environmental impacts caused by the consumption of plastic is the **pollution of ecosystems**, particularly marine ones, and the subsequent **loss of biodiversity**. The concentration of plastics in the oceans is putting over 600 marine species at risk²⁶, both due to the toxicity of the micro-plastics ingested, and because some of these waste products (such as plastic bags), accumulate in the stomachs of these animals (such as dolphins and turtles), and can even block their respiratory tracts.

Each year, over a million birds and more than 100,000 marine mammals die as a consequence of all the plastics that reach the sea²⁷. Recent studies have observed that marine animals are also ingesting micro-plastics, which cause gastro-intestinal blockages and alterations in their feeding and reproduction patterns.²⁸

Human impacts. The accumulation of plastic waste can block river ways and drainage systems, therefore **exacerbating the consequences of natural disasters**, such as the flooding in Bangladesh in 1988. On the other hand, this build up of plastics in the drainage system facilitates the stagnation of water, making it an ideal breeding ground for the **transmission of diseases** such as malaria.

Furthermore, the same plastics and micro-plastics that poison marine fauna can also be very dangerous for humans: it has been demonstrated that the toxic chemicals used to produce plastic can be transferred to animal tissue, thus **entering the human food chain**. In fact, micro-plastics have already appeared in pots of table salt and in both bottled and tap water for human consumption.

Finally, the loss of biodiversity of marine species has a considerable impact on food security, as today more than 2,600 million people depend on the oceans for their primary source of protein.²⁹

Item	Decomposition Time
FISHING STRING	600 years
BOTTLE	500 years
CUTLERY	400 years
LIGHTER	100 years
CUP	65-75 years
BAG	55 years
SHOE SOLE	10-20 years
CIGARETTE BUTT	1-5 years
BALLOON	6 months

Source: Greenpeace.



BY 2050, 99% OF MARINE BIRDS WILL HAVE INGESTED PLASTIC

24 Greenpeace (2019). RECYCLING IS NOT ENOUGH: Plastic packaging waste management in Spain. https://es.greenpeace.org/es/wp-content/uploads/sites/3/2019/03/reciclar_no_es_suficiente.pdf

25 Greenpeace.

<https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/como-llega-el-plastico-a-los-oceanos-y-que-sucede-entonces/>

26 UN ENVIRONMENT.

27 Greenpeace.

<https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/como-llega-el-plastico-a-los-oceanos-y-que-sucede-entonces/>

28 Greenpeace. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/>

29 This makes the oceans the largest source of protein in the world. However, these resources are under threat, not only because of pollution, but also due to unsustainable use, as today 30% of the world's fish populations are being overfished.

Economic impacts. Pollution caused by plastic waste also has economic repercussions, particularly in sectors such as agriculture, tourism and fishing. For example, the rubbish accumulated on beaches directly affects tourism, whilst beach cleaning entails significant public funding costs. In the Asian-Pacific region alone, pollution caused by plastic products generates losses to the tourism, fishing and naval sectors to the value of 1,300 million dollars each year. Whilst Europe invests around 630 million euros each year in removing plastic

waste from its beaches and coastal regions. On a global level, it is estimated that **ocean pollution caused by plastic generates economic losses to the value of 13,000 million dollars each year**. Examining these figures, it has been calculated that the cost it would take to remove all single-use plastics from the environment is higher than the amount needed to invest immediately in prevention measures to halt the dumping of this waste.

WHAT CAN WE DO? LOOKING FOR SOLUTIONS



IF WE DO NOT WANT TO LITERALLY DROWN IN PLASTIC, WE NEED TO ACT NOW TO FIND SOLUTIONS.

Solutions that enable us to stamp out this plastic invasion that is threatening the well being of both marine and human ecosystems.

World leaders have already committed to preserving marine life with one of the 17 global and interrelated goals, the Sustainable Development Goals (SDG), which form part of the new agenda for sustainable development.



Specifically, **SDG14** engages the States to **Conserve and sustainably use the oceans, seas and marine resources for sustainable development.**

Until now, one of the main solutions to address this issue has been recycling. However, unlike card or aluminium, plastic is not a material that can be efficiently recycled. Moreover, since plastic waste has been generated, the percentage that has been recycled is minimal: just 9%, compared to 12% that has been incinerated, and the vast majority, 79%, that has ended up in rubbish dumps or in the environment. Today's **recycling levels have improved but this is still not enough**: almost a third of the plastic packages we use are not channelled into collection systems and end up polluting our environment. In Spain a mere 30% of plastic is recycled.³⁰

³⁰ Greenpeace. <https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/>

If current consumption patterns and today's waste management practices continue, **by 2050 approximately 12,000 million tonnes of plastic waste will be polluting our environment.**

Therefore **recycling is a necessary activity but it is not enough.** So what more can we do? First off, waste management systems must be significantly improved, and more emphasis must be placed on adopting "circular economy" principles, based on the famous "3Rs": **recycle, reuse and reduce.** The last R is undoubtedly the most important, as according to the latest United Nations reports, **the most effective way of reducing the impact of plastic waste is none other than reducing its consumption.**

This statement was reinforced by the General Secretary of the United Nations, António Guterres, in his speech on the World Environment Day 2018, which he dedicated specifically to this issue: "*The fight must focus on*

reducing plastic consumption and on raising awareness so citizens can change their habits. The world must rethink the way it produces, uses and manages plastic".

A large number of countries have adopted measures (from the public sector and in public-private alliances) to reduce the consumption of single-use plastics, especially plastic bags. Among these initiatives is the noteworthy **2015/720 European Union Directive to reduce the consumption per person of lightweight plastic carrier bags** by 2025, which has allowed countries to choose between measures such as a complete ban on this product or the search for agreements with the private sector to reduce consumption levels. However, looking beyond all of these measures, each and every one of us must reduce our plastic consumption (especially single-use plastics such as cups and bags), and rethink the way we use this material, as well as radically change our consumption habits.

EDUCATION: AN ESSENTIAL PART OF THE SOLUTION



ERRADICATING PLASTIC POLLUTION AND CONTRIBUTING TO THE PRESERVATION OF OUR OCEANS CALLS FOR MORE THAN JUST OCCASIONAL CHANGES.

We need a profound transformation of our production and consumption models.

In this respect, **education is vital**, as it equips citizens with the knowledge, skills and attitudes required to find solutions to these kinds of environmental problems, and to modify our production and consumption patterns, so we can advance towards a more sustainable world, both in terms of the environment and society. A recent UN Environment Project report,³¹ has highlighted that in order to secure long-lasting changes in cultural attitudes regarding environmental issues, it is not enough to put

awareness campaigns into action every now and then: to achieve true transformation, **we need social and ecological sustainability principles to be worked into the educational curriculum and in regular teaching practices from a very early age.**

It is worth highlighting that although there are very few studies that thoroughly analyse the interrelation between education (SDG4) and the fulfilment of SDG 12, 13, 14 and 15 (linked to the fight against climate change)³², it has been shown that **people with a higher level of education are more likely to get actively**

31 UNEP (2018) SINGLE-USE PLASTICS: A roadmap for sustainability.

32 **SDG12:** Ensure sustainable consumption and production models; **SDG13:** Take urgent action to combat climate change and its impacts; **SDG14:** Conserve and sustainably use the oceans, seas and marine resources for sustainable development; **SDG15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.



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involved in finding solutions to environmental issues, and to take action to call for political measures that preserve the environment.

Therefore, education leads to a greater involvement and mobilisation of citizens, which, as we know, can be a decisive factor in generating changes in public policies. It is worth noting that pressure from citizens can also be a driver for change in company practices, as businesses generally respond to the needs and demands of consumers.

There are various examples of citizen initiatives, with most headed by young people who have managed to bring about tangible positive changes in the fight against climate change, specifically regarding the use of plastics and the preservation of the ocean.



For example, the “Bye bye plastic bags”³³ campaign in Bali led to the Governor of the island signing a protocol pledging to eliminate all plastic bags in 2018. The campaign, led by two teenage girls, ended up as a global movement.

It has been shown that the **common denominator to the success** of actions of this kind with a far-reaching social impact, is the level of citizen awareness, generated through **environmental education**.

Along these lines, it is worth highlighting that it is not just a matter of acquiring this knowledge, rather that its practical application must have an incredibly positive impact on awareness. For example, in India a citizen action was implemented to clean up the beaches, which made it easy for the participating individuals to clearly identify the origin of the pollution and to adopt changes in their consumption habits; this way, it not only obtained positive results from an environmental perspective but also saw increased citizen participation and expanded to cause a broader social change.

Moreover, it should be noted that the success of these measures that Governments can adopt to drive this gradual and transformational process towards a more sustainable model (through reuse and recycling, using plastic products responsibly, minimising plastic waste generated, etc.) requires citizen acceptance, as they are the demographic being asked to change their consumption habits.

It has been proven that **the higher the consumer knowledge of the social, environmental and economic impacts of over-using plastic products the lower people’s resistance to incorporating these changes into their everyday lives.**

This can be applied to other fields of environmental sustainability, as according to UNESCO, education does not only increase knowledge and awareness of environmental problems, but **also improves competencies and enables individuals to make better and more informed decisions about the environment.**³⁴

Finally, the abovementioned UN Environment Project report indicates the need to increase funding allocated to research and development of alternative materials to plastic materials. In this respect, an **equitable, inclusive and quality education**, is again fundamental, as this search for alternatives and innovation does not only require funding, but also highly qualified and responsible individuals with a strong critical capacity. These people must be able to address complex sustainability issues such as this one.

33 https://elpais.com/sociedad/2019/11/15/actualidad/1573807004_855155.html

34 UNESCO, 2017. Global Education Monitoring Report 2016. Education for people and the planet. Creating sustainable futures for all. UNESCO, 2017. <http://unesdoc.unesco.org/images/0024/002457/245745S.pdf>

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* **Greenpeace.** Plastics.

<https://es.greenpeace.org/es/trabajamos-en/consumismo/plasticos/>



This image was taken by the Portuguese photojournalist Mário Cruz, and won third prize in the World Press Photo 2019 in the environmental photography category.

A boy collecting recyclable material lies on a mattress surrounded by rubbish floating on the river Pasig, Manila, Philippines.

The river Pasig was declared biologically dead in the 1990s, due to a combination of pollution and industrial waste that the neighbouring communities dumped there, with no suitable sanitary infrastructure. A 2017 *Nature Communications* report cites Pasig as one of the 20 most polluted rivers in the world, with up to 63,700 tonnes of plastic flowing down it into the ocean each year.

Initiatives have been put into place to clean the Pasig, some receiving international awards in 2018, though the density of rubbish in certain areas is still so high that the river can be crossed by walking over the waste.



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THE OCEANS !**

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