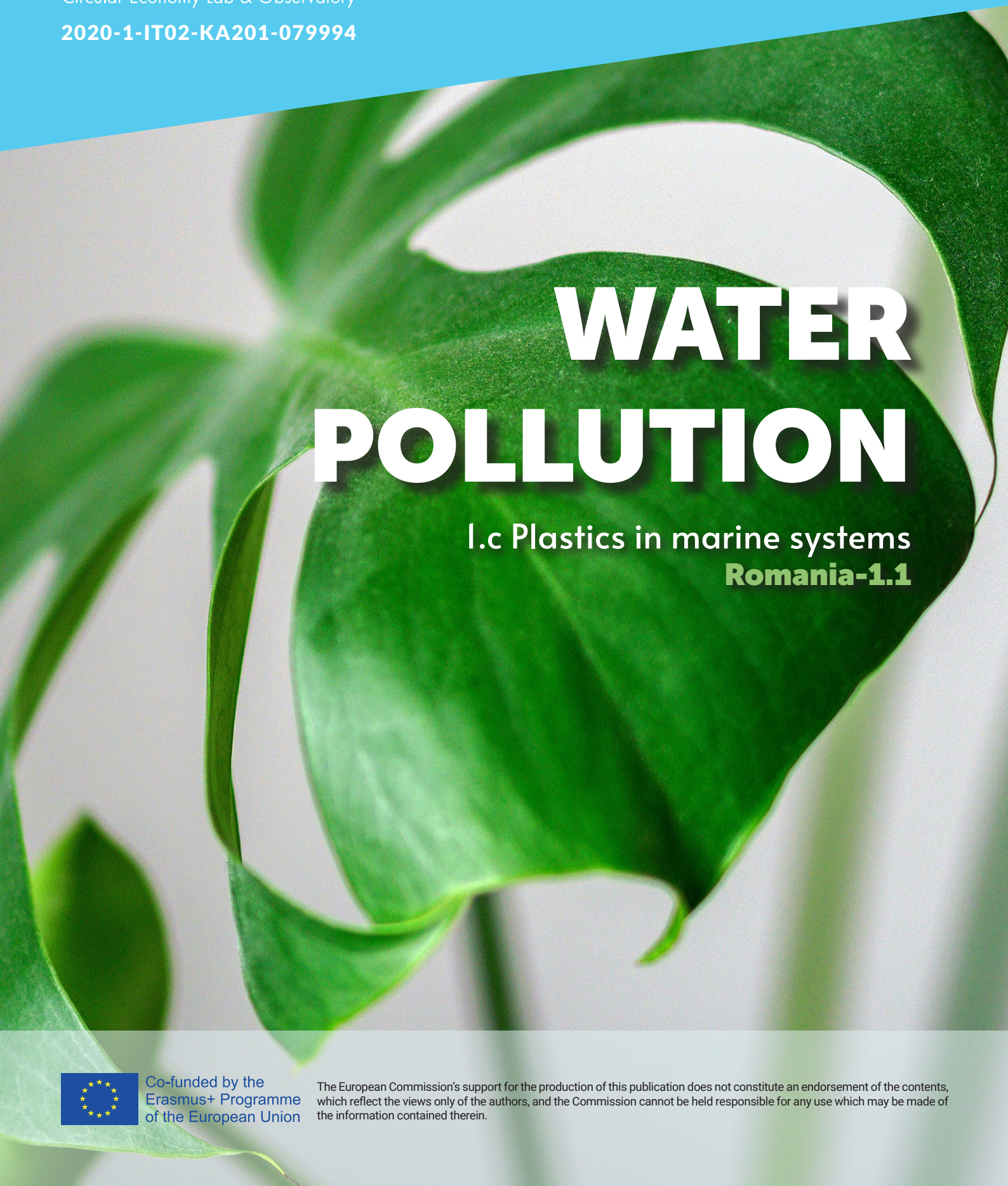
Circular Economy Lab & Observatory

2020-1-IT02-KA201-079994



WATER POLLUTION

I.c Plastics in marine systems

Romania-1.1

Co-funded by the Erasmus+ Programme of the European Union

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

WATER POLLUTION

I.c Plastics in marine systems

Romania-1.1

Introduction

In the coastal and marine ecosystems all around the world, plastic pollution is acknowledged as a serious anthropogenic problem. Any aquatic ecosystem's structure, functioning, and consequently, services and values are directly and/or indirectly disrupted by the unprecedented and ongoing buildup of rising plastic pollution from human sources.

The main sources of these contaminants entering the ocean through diverse ways are land- and sea-based sources. We emphasized many aspects of plastic contamination in coastal and marine habitats in our review research. Different types of plastic pollution, including megaplastic, macroplastic, mesoplastic, and microplastic, are found across ecosystems.

The water, sediment, and biota of the marine and coastal ecosystems show a widespread dispersion of microplastics in their primary and secondary forms. Every year, more than 300 million tons of plastic are produced for use in a wide range of applications. Every year, at least 14 million tons of plastic end up in the ocean, and plastic accounts for 80% of all marine debris found from surface waters to deep-sea sediments.

Plastic debris are ingested or entangled by marine species, causing severe injuries and death. Food safety, quality, and human health are all under risk due to plastic contamination. Climate change is exacerbated by beach tourism. Investigation of new and current legally binding agreements is urgently required to prevent marine plastic pollution. Plastic is a synthetic organic polymer with qualities that make it perfect for a variety of uses, including packaging, construction, home and sporting goods, cars, electronics, and agriculture. Plastic is derived from petroleum.

https://pixabay.com/photos/plastic-in-the-river-sea-flow-4767327/

CIELO Circular Economy Lab & Observatory

Co-funded by the Erasmus+ Programme of the European Union

2020-1-IT02-KA201-079994

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Every year, over 300 million tons of plastic are produced, half of which is used to manufacture single-use items such as shopping bags, cups, and straws. Plastic waste, when discarded improperly, can harm the environment and biodiversity.

Every continent's shorelines contain plastic, although tourist hotspots and heavily inhabited places tend to have higher concentrations of plastic debris. Urban and stormwater runoff, sewage overflows, littering, improper waste disposal and management, industrial activity, tire abrasion, construction, and illegal dumping are all examples of land-based sources of plastic debris in the ocean.

The fishing industry, naval operations, and aquaculture are the main sources of plastic pollution in the water. As a consequence of solar UV radiation, wind, currents, and other natural forces, plastic degrades into tiny particles known as microplastics (particles less than 5 mm) or nanoplastics (particles smaller than 100 nm). Due to their tiny size, aquatic animals swiftly ingest them.

Many nations lack the facilities—such as hygienic landfills, incinerators, recycling capacity, circular economy infrastructure, and suitable waste management and disposal systems—necessary to prevent plastic contamination. Therefore, there is "plastic leakage" into the rivers and seas. The legal and illicit worldwide trafficking of plastic trash harms ecosystems when waste management systems are unable to keep plastic garbage under control.

https://pixabay.com/photos/pollution-trash-garbage-ocean-4855507/

Problem's description

Plastics are excellent materials because they are long-lasting, lightweight, and easily molded. This explains their widespread use: annual production has increased by approximately 9% per year over the last five decades, reaching a total of 380 million tons. However, only about 9% of all plastic ever produced has been recycled. Some plastic waste has been safely disposed of in landfills or incinerated.

https://pixabay.com/photos/environmental-pollution-drina-203737/

CiELO Circular Economy Lab & Observatory
Co-funded by the Erasmus+ Programme of the European Union
2020-1-IT02-KA201-079994

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

However, at the moment, over 30% of annual output seeps into the environment and finally ends up in the ocean, creating a number of issues for marine ecology.

Plastic in the ocean pollutes beaches and harms wildlife. Fishing lines, ropes, and nets account for more than half of all plastic pollution in the Pacific Ocean. This discarded equipment, known as ghost gear, poses a serious threat to ocean wildlife. Plastic will become more prevalent as global demand for fish rises.

By 2050, there may be more plastic in the ocean than fish if things continue as they are. These are eaten by fish, seabirds, and marine animals, which ultimately travel up the food chain to humans. Microplastics may have hazardous consequences for people and marine life; however, these impacts on people and marine life are either currently unknown or not completely understood.

https://pixabay.com/photos/disaster-pollution-plastic-6249334/

It has been calculated that the annual economic consequences of plastic pollution in the industries of fishing, shipping, and tourism combined amount to almost $13 billion. Ocean health, biodiversity, and marine life may be even more at risk from overfishing and climate change. Coral reefs, which are essential parts of many marine ecosystems, will go extinct as a result of warmer and more acidic waters.The IPCC calculates the total cost of continuing human impacts on ocean quality.

Possible solutions

Unlike greenhouse gases, where the developed world and China continue to be responsible for the majority of emissions, marine plastic originates disproportionately in developing countries due to fewer recycling options and increasingly frequent landfill leaks, in addition to illicit dumping.

Policies should be aimed at assisting these countries in developing the capacity to recycle or store their plastics safely. Economics explains why relying solely on voluntary changes in consumer behavior will not work to stabilize the climate or reduce the plastic problem. Individuals are tempted to “free-ride” on the actions of others and fail to consider the full cost of their decisions.

https://pixabay.com/photos/plastics-recycle-oceans-recycling-4675036/

CiELO Circular Economy Lab & Observatory
Co-funded by the Erasmus+ Programme of the European Union
2020-1-IT02-KA201-079994

The European Commission’s support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Economists refer to this type of quandary as a "collective action problem," which Nobel laureate Elinor Ostrom has studied extensively. In some cases, appealing to social norms or nudging households towards more environmentally friendly behavior can be beneficial. This may be particularly true for certain types of plastics consumption.

Promoting the use of reusable plastic bottles or shopping bags is generally inconspicuous and appeals to consumer psychology; it is an easy method to show support for the environment and conformity to social standards while also giving the sense that an instant difference is being made. However, moving to such items is only the tip of the iceberg in terms of preventing plastic pollution.

Even more of a problem in the case of climate change is the fact that it is so difficult to discern the harm brought on by human activities. Our decisions have an impact on others who will live in distant or future nations, but cutting back on our consumption or emissions involves pricey lifestyle adjustments.

When it comes to environmental issues on a global scale, those who harm and those who are damaged never meet, and human traits that typically support cooperation in small groups—for example, a tendency to reciprocate the good behavior of others or punish free-riders—are much more difficult to sustain.

We, too, lack information. When it comes to emissions or plastic pollution, it is challenging to comprehend the overall environmental effect of consumer choices.

https://pixabay.com/photos/pollution-trash-garbage-ocean-4855498/

Without further information, it is very hard to assess the relative climate costs of two distinct items. Carbon pricing is one potential solution: by instituting a global carbon price, carbon-intensive goods would become more expensive relative to other goods. Customers only need to do something they are already familiar with, compare the prices of various products.

CiELO Circular Economy Lab & Observatory
Co-funded by the Erasmus+ Programme of the European Union
2020-1-IT02-KA201-079994

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

https://pixabay.com/photos/plastic-waste-plastic-garbage-waste-3576988/

Conclusions

If we want to keep up with present living standards while preserving the environment, we need innovative technologies that help break the relationship between consumption and pollution.

New plastics, such as polylactic acids, use raw materials such as starch, which can be easily derived from renewable sources such as corn or potatoes.

In addition to having some of the advantageous qualities of current plastics, they are also biodegradable, which lessens their influence on marine habitats.

In order to lessen their carbon impact, however, their manufacture is now more expensive and requires the use of energy that should originate from renewable sources.

The essential advancements in clean energy may be accelerated with the aid of emissions pricing.

Recent research suggests that the EU's emissions trading scheme may have led to a 10% boost in low-carbon innovation by energy companies.

Plastic pollution is gaining popularity. In a world where images are so important, clips of dolphins playing with plastic bags and turtles trapped in beer holders have become rallying points in anti-pollution campaigns. The solution may rely on a simple piece of economics that the public will have to get used to: a higher price for plastic.

https://pixabay.com/photos/plastic-ocean-pollution-garbage-5275150/

Co-funded by the Erasmus+ Programme of the European Union
2020-1-IT02-KA201-079994

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

BIBLIOGRAPHY

- https://www.economicsobservatory.com/how-are-plastics-harming-marine-ecosystems
- https://www.sews-global.com/
- https://www.ncbi.nlm.nih.gov/

GROUP

Blaga-Șutu David, Gall Patrick,
Suciu Mădălin, Tinca Andrei.

Co-funded by the Erasmus+ Programme of the European Union

2020-1-IT02-KA201-079994

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.