

Legal approaches to the problem of pollution of marine environment with plastic

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Abstract

Plastic littering has recently become one of the most highly recognized dangers to the marine environment. The problem of marine plastic pollution is not new and was identified more than half a century ago. Recently, however, with increased media coverage and focusing events such as the discovery of the Great Pacific Garbage Patch, the problem can no longer be ignored. Several legal instruments address this problem. IMO norms aiming to reduce plastic debris were adopted 30 years ago. The MARPOL Convention includes annexes designed to help fight plastic debris. Other maritime legal instruments can also be leveraged to challenge this problem. As with other marine environment problems, the primary source of the problem, and thus the key to addressing it, is located on land. EU directives can serve as an interesting model for reducing marine pollution. The European Commission proposed new EU-wide rules in May, 2018 to target the 10 single-use plastic products most often found in Europe's coastal habitats, as well as lost and abandoned fishing gear. Together these constitute 70% of all marine litter items. The adoption and implementation of this instrument may represent a game changing approach in the battle against marine pollution.

Introduction

Plastics are synthetic organic polymers, which were introduced into mass production in the 1930s and 1940s. The versatility of plastic has led to a great increase in its use in many aspects of everyday life. The popularity of plastic in the production of single-use products has created situation in which plastics make up a great share of global litter, a trend that is even worse in the case of marine litter. According to several studies, plastic makes up between 50 and 90% of marine debris (Galgani et al., 1995, Ribic, Johnson & Cole, 1997). The largest market sector for plastic resins is packaging – material often designed for quick disposal (PlasticsEurope, 2018). Plastics are also an important element of the world's economy. In Europe alone, the plastic industry directly employs more than 1.5 million people and ranks 7th in Europe in industrial value-added contribution,

with a turnover of 355 billion euros in 2017 (PlasticsEurope, 2018).

The rising problem of plastic in the marine environment

There are several different sources of plastic marine debris. One important source of plastic waste in marine ecosystems is human activity at the sea. Hundreds of thousands of tons of plastic fishing gear is dumped into the world's oceans annually as a result of fishing activities (Derraik, 2002). Also, merchant fleets purposefully dump or accidentally lose many plastic materials. However, the primary, and unfortunately often unregulated, source of plastic debris in the marine environment comes from human activity onshore. It is estimated that land-based plastic pollution of the marine environment amounts to 80% of marine litter (Jambeck et al., 2015). Large

amounts of plastic is left by beachgoers or reaches the sea carried by rivers and drainage systems. Plastics also end up in marine waters as a result of the mishandling of wastes inland, bad preparation and management of waste disposal sites, and as a result of illegal dumping.

It is estimated that 4.8 to 12.7 million metric tonnes of plastic enters the ocean annually, from 192 coastal countries (Jambeck et al., 2015). The United Nations Convention on the Law of the Sea (UNCLOS) defines marine environment pollution as “the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities” (art. 1(1)(4) UNCLOS). As marine litter has no legal definition, the United Nations has defined the concept in its documents as “any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment” (UNEP, 2009). While all litter can have negative impacts, the extreme durability of plastic materials can mean that plastic litter persists in the marine environment for a considerable period, possibly as much as hundreds of years, greatly exacerbating associated problems (OSPAR, 2014).

Marine ecosystem problems connected with the rise of plastic in marine environment

Plastics are able to penetrate all marine ecosystems. They can be tracked from the surface of the oceans to the very bottom of the Mariana Trench. Many authors note that plastics have even been found in the Arctic (Ivar do Sul & Costa, 2014). Plastics pose serious and diverse threats to the marine environment. It is estimated that plastic affects 44% of all seabird species, 43% of all marine mammal species, and 86% of all sea turtle species (Laist, 1997). These threats can take several forms. The first is the mechanical impact, including the ingestion of plastic debris, and entanglement in plastic bags, drifting synthetic nets, and ropes (Goldberg, 1995). Pieces of plastic are sometimes mistaken for prey items and swallowed by marine animals, causing various forms of metabolic problems (Goldberg, 1995), including internal injuries and intestinal tract blockages (Zitko & Hanlon, 1991). This can also cause endocrine

disturbances, lower steroid levels, and cause reproductive failures (Azzarello & Van Vleet, 1987).

Another group of threats are chemical in nature. Polychlorinated biphenyls (PCBs) have increasingly polluted marine food webs. PCBs lead to reproductive disorders, increase risk of disease, and alter hormone levels (Lee, Tanabe & Koh, 2001). PCBs accumulate in organism tissue and can magnify up the food chain, increasing risks for individuals at higher trophic levels, including humans who consume seafood (Jambeck et al., 2015). Drifting plastic debris also creates conditions for the spread of invasive species. Finally, plastics which fall on the sea floor inhibit gas exchange between the overlying water, resulting in hypoxia or anoxia, and disturbing the functioning of marine ecosystems (Goldberg, 1995).

Global legal solutions to fight marine debris

The United Nations Convention on the Law of the Sea (UNCLOS) is one of the most important sources of international law regulating human impacts on the marine environment. It defines marine pollution as “the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities” (art. 1(4)). Although not primarily an environmental treaty, the Convention introduces a fundamental obligation (Birnie & Boyle, 2002) that States “shall take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source” (art. 194 (1)). It also adds that “States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights” (art. 194 (2)). Unfortunately, UNCLOS does not go much beyond these general remarks or regulate in detail the problem of marine plastic debris (Ciechanowicz-McLean & Nyka, 2016).

General obligations stemming from UNCLOS, however, are clarified by other conventions. The 1972 London Convention on the Prevention of

Marine Pollution by Dumping of Wastes and Other Matters (Dumping Convention) eliminates one of the potential ways in which plastic debris could enter the marine environment – namely dumping. It also established the first comprehensive regime against the dumping of wastes at the international level (Beyerlin & Marauhn, 2011). With 87 member states it is also the most universally recognised regulation of dumping at sea. According to the convention, dumping means any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea (art. 1 (a)(i)). This definition was later repeated in 1982 in UNCLOS, Article I, gaining even more universal application. Article IV of the Convention prohibits dumping of wastes listed in Annex I to the convention. Annex I includes plastics and other persistent synthetic materials, for example, netting and ropes, which may float or remain in suspension in the sea in such a manner as to interfere materially with fishing, navigation, or other legitimate uses of the sea.

The majority of industrialised countries (51 parties) also signed the Protocol from 1996 to the dumping convention (entered into force in 2006). This introduced several modern principles into the London Convention, including, among others, the polluter pays principle and the precautionary principle (Sands et al., 2012). The Protocol also reduced the number of exceptions which allowed, in certain circumstances, the dumping of Annex I wastes. Similar to the original Convention, the Protocol adopts a reversed listing approach. State parties are required to prohibit the dumping of “any wastes or other matters with the exception of those listed in Annex 1.” Further, even wastes listed in Annex 1 require a special permit issued by governmental bodies. The Annex 1 list does not include plastic, which can be interpreted as a general ban on the dumping of plastic wastes.

The Protocol also confirms the approach taken by the London Convention and UNCLOS, which excludes debris which are derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment from the definition of dumping, which would include residual waste from these platforms. This regulatory loophole was filled by the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL). Annex V to the MARPOL Convention, which entered into force in 2013 and was recently revised in 2018, is particularly important with regard to anthropogenic debris at sea. Ships are required to dispose of their waste at special land-based waste

facilities, and states are obliged to provide ships with this infrastructure (Vince & Hardesty, 2018). Preventive measures, as well as waste management measures, were also introduced, as Annex V obliges shipowners and operators to minimize taking material onboard that could become garbage. Ship-specific garbage minimization procedures should be included in the Garbage Management Plan (Art. 2.1 Annex V MARPOL). However, compliance is an important issue which requires further work. Additionally, poor implementation of adequate national rules which would create obligations to individuals can limit overall effectiveness of international agreements (Ryan, 2015).

Tightened regulation of plastic manufacturers and converters has reduced the loss of industrial pellets and legislation has reduced the disposal of plastic wastes at sea. However, it has also become apparent that most litter entering the sea did so from diffuse, land-based sources that are more difficult to control (Ryan, 2015). Three quarters or more of waste that ends up in the ocean comes from land-based sources (Jambeck et al., 2015). It is obvious that plastics are an important element of the international legal agenda, but as far as regulatory measures have come in this area, efforts to address plastic marine debris has been dominated by soft law instruments, which lack obligatory character (Vince & Hardesty, 2018).

The United Nations Environment Programme (UNEP) prepared a number of guidelines, which address the problem of marine environmental pollution. In 2012, the Honolulu Strategy was adopted. Goal A of this strategy is reducing the amount and impact of land-based sources of marine debris. Seven strategies were outlined to meet this goal including, educational programs, employment of market-based instruments, introduction of best practices and proper infrastructure for stormwater management, and capacity building, among others. Another example of UNEP’s initiative in the field of marine littering is the Global Partnership of Marine Litter. The Partnership is an element of the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activity. In 2017, UNEP passed a non-binding resolution on marine litter and microplastics, encouraging states to develop integrated and source-to-sea approaches to combat marine litter and microplastic from all sources (Resolution UNEP/EA.3/L.20).

Important initiatives have also been undertaken by the Conference of Parties to the Convention on Biological Diversity. Decision XI/18, adopted by the Advisory Panel on Global Environment Facility

in 2012, addresses the impact of marine debris on marine and coastal biodiversity. Also, international organisations have introduced economic cooperation as a consequence of the rising awareness of the problem of marine debris. The G7 Group released an Action Plan to Combat Marine Litter in June 2015 and the G7 and G20 Groups also created Action Plans in 2017 (Vince & Hardesty, 2018).

Regional legal solutions to fight marine debris

Despite the centrality of UNCLOS to ocean governance, regional conventions are also playing an important role. A Regional Action Plan on Marine Litter Management has been created in the Caribbean Region. A Northwest Pacific Action Plan has been endorsed to protect the marine environment of the Northwest Pacific Region from land-based activities. In Europe, EU law also emphasized regional cooperation as a vehicle through which values of environmental protection can be promoted, not only within the EU, but also in neighbouring countries. In the North of Europe, the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) introduced the Regional Action and Implementation Plan. It created marine litter monitoring mechanisms as well as data reporting systems. This Plan focuses on port reception facilities and the proper management of fishing gear, among others. Environmental protection in the Baltic Sea Region is regulated by the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM), which is one of the most modern and innovative regional seas conventions. The Regional Action Plan for Marine Litter in the Baltic Sea was adopted in 2015. The regional goal agreed to in HELCOM is to significantly reduce the amount of marine litter by 2025, and to prevent harm from litter in coastal and marine environments. The South Convention for the Protection of the Marine Environment and Coastal Region of the Mediterranean (the Barcelona Convention) addresses pollution from both land and sea-based sources. Within the framework of the Barcelona Convention, Parties adopted the first legally-binding plan for marine litter management in Europe – Regional Plan for Marine Litter Management in the Mediterranean.

Regional initiatives are also undertaken within regional economic integration organisations. The European Union, with its well-developed common environmental policy can be treated as a role model for other regional cooperation initiatives in the

field of environmental protection. The problems of proper waste management and prevention of marine pollution are included in the current 7th Environmental Action Programme of the European Union. The 7th Environmental Action Programme was adopted in 2013 and determines EU environmental policy through 2020. The main goal of the Programme is to protect, conserve, and enhance the EU's natural capital. These political initiatives were followed by legislation. In 2015, the Directive on Packaging and Packaging Waste of 20 December 1994 (Directive, 1994) was amended. An obligation to reduce the amount of lightweight plastic carrier bags was introduced, with a limit of 90 bags per person per year by 2019, and a further reduction to 40 bags a year by 2021 (art. 4). This suggests that the European Union has taken the most effective path for eliminating marine plastic pollution – namely reducing the production and use of plastic products. Limiting plastic wastes onshore limits plastic waste pollution offshore.

Directive 2008/56/EC (Directive, 2008) of the European Parliament and of the Council of 17 June 2008 established a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). This Directive aimed to achieve a Good Environmental Status (GES) for EU marine habitats by 2020 and to protect the resource base upon which marine-related economic and social activities depend. This was the first EU legislative instrument related to the protection of marine biodiversity, as it contains the explicit regulatory objective that “biodiversity is maintained by 2020”, as the cornerstone for achieving GES. The Directive enshrines an ecosystem approach to the management of human activities having an impact on the marine environment in a legislative framework, integrating the concepts of environmental protection and sustainable use. Marine littering is included in the criteria for GES (Commission Decision, 2017), specifically in Descriptor 10 which states, “Properties and quantities of marine litter cannot cause harm to the coastal and marine environment.”

In January 2018, the European Commission (EC) published a Strategy for Plastics in a Circular Economy. The Strategy called for measures at the level of both the EU and Member State (MS) to reduce “the unnecessary generation of plastic waste, especially waste from single-use items.” The EC stated in its 2019 work programme published on October 23, 2018, that “[s]peedy agreement on the proposal on single-use plastics is necessary.” As a consequence of this political undertaking, in May 2019

the EU formally approved pioneering legislation to curb single-use plastics. Directive (EU) 2019/904 aims to prevent and tackle marine litter by, among other things, phasing out unnecessary single-use plastics, introducing economic incentives to reduce consumption and to transition to reusable systems, and establishing high collection rates and extended producer responsibility schemes (EPR) (Directive, 2019).

The rationale behind the Directive is based on a preventive approach. Not generating certain categories of plastic wastes efficiently prevents their disposal into the marine environment. According to the preamble, the Single-Use Plastics (SUP) Directive “promotes circular approaches that give priority to sustainable and non-toxic re-usable products and re-use systems rather than to single-use products, aiming first and foremost to reduce the quantity of waste generated.” Single-use plastic is defined under the SUP Directive as “a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or re-used for the same purpose for which it was conceived.” It is estimated by the EU Commission that SUP is responsible for 70% of marine plastic litter. What is more, the instrument can be developed to cover additional products in the future.

The SUP Directive uses market-based instruments to achieve its goals, which are relatively modern and are popular in more recent international environmental agreements (Nyka, 2018). These measures include a trade ban (effective from mid-2021) on popular single-use plastic products for which there are non-plastic alternatives. Examples of these products include cotton bud sticks, cutlery (forks, knives, spoons, and chopsticks), beverage stirrers, straws, plates (including paper plates with plastic lining). The Directive further included the adoption of national consumption reduction targets, the promotion of reusable alternatives, the implementation of economic instruments (such as deposit-return schemes), as well as the establishment of market restrictions for products for which alternatives are less widely available, with a goal of reducing their use and creating incentives for developing such alternatives. Through these mechanisms, it also supports pre-existing EU norms on beverage containers with a capacity of up to three litres, packets and wrappers, food containers, lightweight plastic carrier bags, and fishing gear. Through its use of different market-based instruments, SUP Directive is

similar to the Vienna Convention on the Protection of Ozone Layer and there are hopes that this will lead to similar success.

Conclusions

It is a paradox, that in the fight against marine plastic litter it was easier to create a relatively effective system for preventing pollution from ships than it has been from land-based sources. There are better monitoring possibilities onshore and it is technically easier to manage waste on land than in/on the water. One reason for this situation, however, is that contemporary society has to face the fact that we are addicted to plastic. For the last six decades plastic has become one of the most frequently produced materials, and the prescription is unfortunately going to be painful for our consumption habits. Identifying a problem does not free us from making an effort to mitigate marine plastic pollution, especially as the whole of marine biodiversity is at stake. Regional EU measures provide an interesting model for designing new global regulations in the field of onshore management of plastic wastes. There are different ideas concerning the details of such instrument, from preparing a completely new convention (Worm et al., 2017; Dauvergne, 2018) to adding the issue of plastics to an existing international legally-binding instrument such as UNCLOS in order to promote the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ) (Tiller & Nayman, 2018). There is however not much time left to stop the mass extinction of marine biodiversity.

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