



Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

Can the Basel and Stockholm Conventions provide a global framework to reduce the impact of marine plastic litter?[☆]

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ARTICLE INFO

Keywords:

Marine litter
Basel Convention
Stockholm Convention
SAICM
Marine debris
International policy

ABSTRACT

The issues resulting from plastic waste in the marine environment have highlighted a general failure to control this pollutant on both land and at sea. The international community is now realising that the increasing growth in the amount of plastic pollution in the ocean is reaching a critical point. This has led to a questioning of the current international governance arrangements for marine litter. The environmental and socio-economic impacts of marine litter are a symptom of policy failures and greater action is required “upstream” by industry on land to reduce these impacts. The Stockholm and Basel Conventions are international binding instruments that offer the best opportunity to reduce the impacts of plastics and plastic waste globally. We examine weaknesses in how hazardous wastes are categorised and the options to close the gaps in the current framework that allow for and keep pace with innovation. Both conventions are found to be inadequate to manage the entire lifecycle of all plastic applications. Options are suggested for strengthening the international legal and policy framework in order to reduce on a global scale 1) the *quantity* of plastic waste generated, and 2) the *hazard* of plastics throughout their lifecycle.

1. Introduction

Plastic is a component of marine litter that has caught the attention of scientists, civil society, policymakers and the public and private sectors. This is due to the ongoing efforts by researchers over decades in raising the profile of the long-term impacts of marine plastic litter. Globally, plastics have been shown for some time to make up 60–80% of marine litter [1] with percentages higher in some regions [2–4]. More recently, our modern throwaway lifestyles have been blamed for the estimated 4.8–12.7 million metric tons of plastic waste entering our oceans every year [5].

The ecological and socio-economic impacts result from ingestion, entanglement, habitat destruction and chemicals sorbed from or leached into surrounding waters [6–10]. Microplastics present similar concerns of ingestion, chemical sorption and leaching [11]. Research has shown that chemicals added during the manufacturing process of various plastic products, such as flame retardants, stabilisers, Bisphenol A (BPA) and Polybrominated diphenyl ethers (PBDE), may leach from ingested plastics and bioaccumulate within organisms [12]. A 2011 report stated that “the United Nations Environment Program has declared plastic marine debris and its ability to transport toxic substances one of the main emerging issues in our global environment” [13].

The costs of cleaning up marine plastic debris are often borne by those who are not responsible for the pollution [14]. This includes the maritime sectors [15]. Plastic waste also raises concerns for human health and long-term food security but actual risks to either are still unknown. The issue of marine plastic litter is global, spanning cultural, geographical, and jurisdictional boundaries. It is spread by winds and ocean currents [10], resulting in a problem of international scale. The transboundary nature of the problem creates a need for attention at the global level. Yet action worldwide has been below expectation with UN Environment reporting in 2006 that marine litter had worsened, citing inadequate legislation as a direct contributor to this failing [16].

At the international level, the agreement with the greatest application to the management of plastics is the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* [17]. This agreement provides solid vision for international governance of plastics. The Preamble states “the most effective way of protecting human health and the environment from the dangers posed by [hazardous and other] wastes is the reduction of their generation to a minimum in terms of quantity and/or hazard potential.” Thus, *quantity* as well as the *characteristics* of a product are important once it becomes waste.

Much of the discourse at the international level has focused on the

[☆] This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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<https://doi.org/10.1016/j.marpol.2018.01.013>

Received 1 August 2017; Received in revised form 19 December 2017; Accepted 12 January 2018
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application of the Basel Convention to the transboundary movement of waste that is classified as hazardous, particularly from north to south [18–21]. Research has also found that a large portion of the trade in waste is south-south (ref) but that the majority of trade in hazardous waste is north-north [18,22]. The increasing trade in eWaste and the distinction under the Basel Convention between waste and non-waste is currently also a focal point for the Secretariat of the Basel Convention [23].

The current policy framework does not classify plastics as hazardous unless they contain persistent organic pollutants (POPs) regulated under the Stockholm Convention on Persistent Organic Pollutants [24] or if they meet certain criteria under the Basel Convention. As per the latter, plastics from household wastes are regarded as “other” wastes “requiring special consideration” (Annex II) and for the most part do not fall within the discussions on hazardous wastes.

This article focuses on plastic as a non-hazardous waste. The limitations and opportunities of the international legal and policy framework to reduce the impact of plastics throughout their lifecycle are discussed. In particular, the roles of the Basel Convention and the Stockholm Convention are examined. Options are suggested for strengthening the international legal and policy framework in order to reduce on a global scale 1) the *quantity* of plastic waste generated, and 2) the *hazard* of plastics throughout their lifecycle.

2. Increasing concern at the global level

Concern over the risks posed by marine plastic litter has been raised in a number of international fora over previous decades. In 2005, the UN General Assembly drew specific attention to marine debris, noting the lack of information and data on the issue [25], and again in 2012 in the outcome document entitled *‘The future we want’* [26]. The latter recognised the negative effect of marine plastic pollution on ocean health and marine biodiversity and governments committed to reducing the incidence and impacts of such pollution by 2025. The United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea focused on marine debris at its 6th and 17th meetings in 2005 and 2016 respectively. Resolutions on the matter were also adopted at the first three United Nations Environment Assembly (UNEA) meetings in 2014, 2016 and 2017. Marine pollution in the form of plastics and microplastics was included in the 14-point call to action at the first UN Oceans Conference in June 2017 [27]. A 2014 UN report calculated the cost in damage to marine ecosystems by plastic waste at US\$13 billion, adding that this was likely an underestimation [28].

Although the management of plastics is not the primary objective under other fora, they are of concern. In 2016, Parties to the Convention on Biological Diversity [29] adopted a decision on the prevention of marine litter (COP XIII/10) and published a report on the impacts to marine and coastal biodiversity [30]. The release of microplastics was the focus of reports published by GESAMP [10], the FAO [31] and the IUCN [32]. The Conference of the Parties to the Convention on Migratory Species (CMS) adopted resolutions in 2011 and 2014 specific to marine debris and published three reports on the matter [33]. The International Maritime Organization (IMO) is investigating possible releases of micro- and macroplastics into the marine environment through activities permitted under the London Convention and its Protocol [34].

In addition to the efforts listed here, guidelines were developed under the Basel Convention for the environmentally sound management of all forms of plastic waste [35] as well as hazardous eWaste, much of which contains plastic [36]. Although not a conclusive listing, these efforts illustrate the level of concern over the environmental impacts by plastic waste and signals a clear intent to find opportunities for solutions within the current policy framework. However, marine plastic litter is essentially a symptom of a land-based problem. It is not only marine environments that require protection from plastic waste, but also human and ecosystem health. A lifecycle approach is required

that not only prevents the generation of plastic waste but also reduces the hazard of plastic products.

3. Managing the lifecycle of plastics within the current international legal framework

Protection of the marine environment from pollution is the objective of three instruments at the global level, thereby inferring prevention of plastic pollution. The *Law of the Sea Convention* [37] aims to protect and preserve the marine environment from both sea- and land-based sources of pollution. Terrestrial impacts are not targeted but are implied if pollution of the marine environment results. MARPOL Annex V [38] and the London Convention and its Protocol [39] prohibit the discharge or intentional dumping at sea of plastic waste in all maritime zones globally. With the majority of marine plastic litter originating on land [40], the ability of these instruments to globally reduce the hazard and quantity of plastic waste is therefore limited by their geographic scope.

There is increased recognition for the need to address the issues of pollution “upstream” to reduce the generation of hazardous and other wastes. This is often promoted through the circular economy approach [41–43]. Policy can incentivise end-markets for plastic waste [44], but establishing a circular economy may not necessarily maximise all the social and environmental outcomes possible.

Protection of human health and the broader environment are the objectives of both the Stockholm Convention and the Basel Convention. The former aims to achieve this through the elimination of POPs and the latter through the environmentally sound management of hazardous and other wastes. Together, these instruments provide the greatest opportunity to address the impacts of plastics throughout their lifecycle by regulating the POPs that may be used in the manufacture of plastics as well as the international trade in plastic waste. The Basel Convention has 186 Parties [45] and the Stockholm Convention has 181 Parties [46] (both including the EU), providing a high level of international participation and further supporting the opportunity to manage the hazard and quantity of plastics globally.

4. Application of the Basel Convention to the lifecycle of plastics

The Basel Convention establishes a broad duty for countries to reduce to a minimum their generation of plastic waste (Article 4.2), but primarily provides measures to reduce the quantity and hazard of plastics at the waste phase. Plastics are classified as “other waste” unless they display certain defined characteristic that would deem it “hazardous.” The cross-border transportation of plastic waste, be it “hazardous” or “other,” is to be regulated by Parties. The Convention intends for Parties to manage such waste within the country it is generated or imported in an “environmentally sound” manner (Article 4.2).

4.1. Management through trade restrictions

A Party to the Basel Convention may list plastic waste as hazardous within domestic legislation (Article 3.1). Trade of plastic waste with this Party from other Parties is then not permissible (Article 4.1). Further obligations are placed on the exporting Party which must disallow the trade of plastic waste if the management of such waste by the receiving Party is not deemed environmentally sound (Article 4.2.e). Likewise, if the authority of the importing Party believes the waste imported will not be managed appropriately, it must also disallow the trade (Article 4.2.g). Trade of plastic waste is not allowed with countries that are not Party to the Convention unless a prior arrangement is negotiated between them (Articles 4.5, 11).

The Convention allows for the trade of plastic waste between Parties if the exporting Party does not have the technical capacity and infrastructure to ensure environmentally sound and efficient disposal. A Party may also export plastic waste if it is destined for recycling or recovery (Article 4.9). However, trade that is allowed must be reduced

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