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Legal Analysis of the Prevention of Marine Microplastics Pollution

Hanxia Ran[1]

[1] China Institute of Boundary and Ocean Studies, Wuhan University, Hubei, China

Correspondence: Hanxia Ran, China Institute of Boundary and Ocean Studies, Wuhan University, Hubei, China.

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Abstract

The protection of marine environment and the preservation of marine ecology are closely related to everyone. However, due to the increase of human social resource consumption and the relative lack of social awareness of marine ecological environment protection, a large number of industrial products are discharged into the ocean, which poses a serious threat to the marine ecological environment. Plastic products are widely used in society because of their low cost, small volume and light weight. A considerable part of waste plastic products flow into the ocean and gradually decompose into microplastic waste. At first, the pollution problem of microplastic waste did not attract enough attention. However, with the continuous deterioration of the marine environment and the destruction of marine biological habitats, the international community has paid more and more attention to this problem and raised the priority of the prevention of marine microplastic pollution. The most obvious manifestation is that the proportion of the resolutions about the management of marine microplastic pollution is increasing in the resolutions of the United Nations General Assembly. There are more and more researches on the prevention and control of marine microplastic pollution in the academic circles of natural science and social science. This paper analyzes the shackles of marine microplastic pollution prevention and control from the perspective of international law, such as difficulties in international legislation, unclear distribution of jurisdiction and responsibility, obstacles in the transformation of international law and domestic law, and the lack of foundation for international cooperation. Although there are many obstacles to the prevention and control of marine microplastic pollution, countries should still adhere to the concept of "Maritime Community with a Shared Future" in marine governance, cooperate with each other, mainly in prevention and secondly in governance, and jointly maintain the marine ecological environment.

Keywords: international law, microplastics, marine litter, marine environment protection, Maritime Community with a Shared Future

1. Introduction

1.1 Background and Significance

Plastic products are widely used in human life today because of their wide range of applications and low prices, resulting in a huge amount of plastic waste. Smaller plastic particles were first found on the high seas in the 1970s (Zhang Na, Zhou Yawen, Bai Yu, Zhou Zhongkai & Jiang Yumei, 2020), and it was not until the early 21st century that Thompson et al. first used the term "microplastics" to describe the accumulation of microscopic pieces of plastic in marine sediments (Tompson R C, Closen Y, Mitchell R P, et al., 2004), and noted the importance of their impact on marine ecosystems. The first international workshop on microplastics in 2008 defined microplastics as plastic fragments less than 5 mm in diameter (Yang Lu et al., 2018). In recent years, microplastics in the ocean have been detected in many ocean and polar researches conducted in China. Microplastics come from a wide variety of sources and are distributed in all corners of the ocean. According to research studies, part of marine microplastics come from large plastic fragmentation, and another part comes from raw materials flowing into the sea, such as resin particles, plastic abrasives in personal care products and

cleaning agents (Liu Shiyao, 2021). Microplastics because of its small particle size and large specific surface area, a variety of chemical pollutants can easily be absorbed into seawater, which can have a compound toxic effect on organisms in seawater (Zhang Lei, 2021), and may continuously accumulate through the food chain, thus adversely affecting marine ecology, more than 800 marine and coastal species are affected by plastic pollution due to ingestion of plastic, entanglement in plastic and other risk factors. A large amount of plastic waste flows into the ocean without effective treatment, polluting the marine environment and endangering the survival of marine life, which will eventually affect humans themselves.

The problem of marine plastic litter grew during the first through the fourth United Nations Environment Assembly, and the Assembly took it increasingly seriously, adopting several resolutions to reduce marine plastic litter. Litter disposal and accumulation in the marine environment is one of the fastest-growing threats to the health of the world's oceans (Pham CK et al., 2014). Microplastic contamination now appears as one of the world's main environmental concerns and ecological science research by the 2nd United Nations Environment Assembly, along with global climate change, ozone depletion and ocean acidification as major global environmental issues. If current production and waste management trends continue, roughly 12,000 Mt of plastic waste will be in landfills or in the natural environment by 2050 (Geyer, Roland & Jambeck, Jenna & Law, Kara, 2017), and the degradation of the marine environment will be intensified. The 2021 United Nations Environment Programme (UNEP) report, From Pollution to Solutions: A Global Assessment of Marine Litter and Plastic Pollution, illustrates the seriousness of the problem: plastic accounts for 85 percent of marine litter and warns that by 2040, volumes of plastic pollution flowing into marine areas will nearly triple, adding 23-37 million metric tons of plastic waste into the ocean per year (McGlade, Jacqueline & Fahim, et al., 2021).

With the awakening of the international community's awareness of environmental protection, the call for joint management of marine microplastic litter is increasing, and some international and regional conventions and treaties have bound and regulated the behavior of countries, playing a positive role in the management of marine microplastic litter. China, as a responsible country with a vast area and a huge population, has been consistently criticized by western countries as the country with the largest marine plastic litter emissions. However, it is worth noting that a study by Dr. Stephanie B. Borrelle, an American scientist, shows that despite having the largest population in the world, China's per capita plastic waste production is less than 1/6 of that of developed countries such as Europe and the United States (Li Daoji, 2020). In fact, China advocates for harmony between man and nature, and urges consideration of people's desire for a better life to achieve win-win results in the fields of environmental protection and economic development. In 2019, Chinese President Xi Jinping called for concerted efforts to safeguard maritime peace and build a "Maritime Community with a Shared Future" in his speech in Qingdao, pointing out that "the ocean does not separate our blue planet into isolated continents; instead, it links the peoples of all countries to form a global community of shared future that remains bound together through thick and thin (THE STATE COUNCIL INFORMATION OFFICE THE PEOPLE'S REPUBLIC OF CHINA, 2021)." The ocean is the common home of mankind and needs to be protected by the international community. Academia has responded quickly to this concept, and in the social sciences, for example, East China Normal University established the "UNESCO Intergovernmental Ocean Science Commission Regional Training and Research Center on Marine Plastic Litter and Microplastics" in April 2019. In the natural sciences, Chinese scientists have been making breakthroughs in tackling marine microplastics pollution.

Although the problem of marine microplastic litter has received considerable attention from the international community and has been repeatedly mentioned in meetings and reports of international organizations and NGOs, the prevention and control of marine microplastic pollution has not achieved good results and the effectiveness of management is not significant yet. This paper focuses on analyzing the reasons for the difficulties of marine microplastic litter management and how to better regulate it from the legal level. By sorting out the dilemmas faced in the management of microplastic pollution at home and abroad, I put forward a few thoughts, hoping to contribute to the restoration of a clean marine environment.

1.2 Research Framework

This paper analyzes the research results of existing experts and scholars, and proposes a relatively new research perspective based on the previous ones, namely, the legal response to the prevention and control of marine microplastic pollution. The first part of this paper shows the current situation of marine microplastic pollution, pointing out the sources, causes and hazards of marine microplastic pollution. The second part focuses on the difficulties faced in the process of combating marine microplastic pollution, with emphasis on the shackles of international law, such as the difficulties of international legislation, the lack of clarity in jurisdiction and responsibility, the obstacles in the interpretation and application of international law and domestic law, and the lack of international cooperation. The third part focuses on the problems identified in the second part, and proposes corresponding solutions to better serve the protection of marine environment.

1.3 Innovation

The research on marine microplastic pollution by domestic and foreign scholars can be roughly divided into three levels, environmental science, social governance and law. The research results on marine microplastic pollution in the context of natural science are not the focus of this paper, and will not be discussed for the time being. Some scholars conduct research on the text of international law norms, and examine the progress and shortcomings of the textual norms of relevant international treaties and agreements. Besides, there are also some papers that combine the concept of international governance in political science and marine pollution governance in international law, focusing on the cooperation mechanism, implementation, constraints, and future prospects among global and regional countries. As far as the literature compiled by the author, there are not many articles on marine microplastic pollution prevention and control, and the relevant governance status and measures are not well analyzed and summarized. In view of this, this paper takes international law as a starting point to respond to the current problems of microplastic pollution prevention and control, clarify the causal links, and propose targeted solutions. This paper provides a new perspective on the prevention and control of marine microplastic litter, and proposes some suggestions for the prevention and control of marine environment. This paper combs through the literature of books, papers and reports of international organizations at home and abroad, from which it can be seen that the number of articles on the prevention and control of marine microplastic litter pollution under the threshold of international law is not much. From the selection of topics, the governance of marine microplastic litter pollution problem is closely related to the Maritime Community with a Shared Future proposed by President Xi, and is close to the needs of environmental protection, so the selected topic is somewhat innovative.

2. The Legal Dilemma of International Law Regulating Marine Microplastic Pollution

The problem of marine microplastic pollution has been long-standing, and the United Nations Environment Assembly has repeatedly mentioned the issue in its resolutions on marine litter and microplastics, and encouraged all parties to cooperate and work together to prevent the pollution, and the General Assembly has been paying more and more attention to it. The United Nations Environment Programme, the International Maritime Organization and the United Nations Development Programme are also actively carrying out research on the subject of marine microplastics, listing a number of data and releasing a number of research reports, calling on the international community to recognize the great harm of marine microplastic pollution (UN Environment, 2018). With the increasing awareness of the international community on environmental protection, the domestic legal policies on microplastics prevention and control are also being gradually improved. However, the existing global treaties are not sufficient to deal with the current situation of marine microplastics pollution due to their vagueness and fragmentation, and the main problems are as follows.

2.1 A Joint Call for an International Legally Binding Agreement on Marine Microplastics

The legal norms concerning the prevention and control of marine microplastics pollution can be divided into global treaties and protocols, regional treaties, protocols, and domestic laws of each country. The initiative to conclude a legally binding global agreement has a long history, as demonstrated in many national proposals (Center for International Environmental Law, 2022), and the international community has called for a global legally binding instrument on plastic pollution covering measures along the entire life cycle of plastics, including extraction of feedstocks, production, transport, use, disposal and remediation.

However, the international legal regime for the prevention and control of marine environmental pollution has not yet formed a legal framework that covers the entire life cycle of plastic pollution management. In practice, the main legal instruments on marine litter prevention and control at the global level are the United Nations Convention on the Law of the Sea, the International Convention for the Prevention of Pollution from Ships, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and the relevant provisions of the 1972 London Convention and its 1996 Protocol. Regional level conventions such as the Convention for the Protection of the Marine Environment of the North-East Atlantic, and the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area. The main objective of the above conventions is not to directly address the microplastic pollution, and there is still a lack of international agreements to systematically address microplastic pollution. Although the existing treaties can be applied to the management process of microplastic waste through treaty interpretation, they mostly set general obligations and provisions, lacking specific rules, and are not very enforceable. Since the provisions of UNCLOS, MARPOL, and Basel Convention are all formulated in their own specific background, it is difficult to effectively manage marine microplastic pollution because the treaties are fragmented and the vulnerability of the deep sea has not been considered at the time of formulation (Tou Xiaodong & Zhao Wenping, 2019). As regard to the domestic law, a considerable number of countries have regulations and policies on vessel sewage discharges, such as China, the United States, Canada, Japan and EU member states, which are effective in domestic waste management of offshore areas. In the United States, for example, the Microbead-Free Waters Act of 2015

prohibits the manufacturing, packaging, and distribution of rinse-off cosmetics containing plastic microbeads (U.S. FOOD & DRUG ADMINISTRATION, 2017). It is a great start to eliminating other sources of microplastic and plastic pollution (Trash Free Waters Program. n.d.), and providing a reference for other countries and international regulations (Wei Weigang, 2019).

It is easy to see that most international or regional conventions do not have clear provisions on marine microplastics, and the relevant provisions are ambiguous. Although the treaty interpretation method can be equally applied to marine microplastics, it is undesirable to extend the meaning of the provisions. Regional cooperation and domestic laws are tailored according to the economic, social, cultural and ideological conditions in a specific area, and have obvious regional characteristics, which are too regionalized and fragmented for marine environmental protection and microplastic pollution control.

2.2 Jurisdictional and Responsibility

Microplastics in the marine environment come from a wide range of sources, including the breakdown of plastic waste in seawater, industrial discharges, and from sewage and runoff from the use of products containing microplastics. The source of microplastic litter is even more difficult to identify when plastic litter enters the ocean and decomposes into microplastics, which is already difficult to identify. The inability to identify the source can lead to jurisdictional uncertainty or conflict of jurisdiction, which in turn affects the allocation of states' legal responsibilities. The microplastic pollution belongs to the internationally wrongful act of a State, and its constitutive elements are, firstly, the acts attributable to the subject of international responsibility, and secondly, the internationally wrongful acts. First of all, the small size of marine microplastic litter and the rapid ocean currents make it difficult to determine the source of pollution, and it is impossible to attribute it to specific subjects of international law or transnational enterprises, etc. Secondly, regarding the characterization of the act, the Draft Articles on Responsibility of States for Internationally Wrongful Acts adopted by the International Law Commission in 2001 summarized the act as a serious breach of obligations under peremptory norms of general international law. Although the issue of marine litter and microplastic pollution has arisen in the distant past, the existing study is not yet mature enough to clarify it as a serious breach of general *jus cogens*. As a result, the status of marine microplastic pollution has been delayed due to the difficulty of determining who has the jurisdiction and how to allocate responsibility, as well as who will make subsequent compensation and supervise the subsequent work.

2.3 The Relation Between International Law and Domestic Law

There are two main doctrines of how international law is applied in domestic law: first, monism, which means that domestic law takes precedence, or international law takes precedence. All rules of international law are supreme over municipal law, that a municipal law inconsistent with international law is automatically null and void and that rules of international law are directly applicable to the domestic sphere of States; second, dualism, which means that international law and domestic law are two separate legal systems which exist independently of each other, have no subordination, and are parallel in effect, and international law can only be applied in domestic courts if it is transformed into domestic law. In the field of marine environmental protection, at the domestic law level, countries formulate and effectively implement relevant laws, regulations and policies, such as developing a recycling and sorting system for plastic waste and advocating the use of biodegradable plastic products. At the international level, various global conventions, regional regulations and framework documents have different levels of provisions on microplastic waste pollution. From the existing global and regional treaties, some of them reflect the position of adopting a monolithic relationship between conventions and domestic laws. Representative countries in the international community, such as China and the United States, also tend to adopt a "treaty over domestic law" approach (Zhang Xiangjun & Wei Hanbing, 2021). However, in practice, there is a phenomenon of "non-compliance" in the prevention and control of marine microplastic pollution, and there is a great uncertainty in the responsibility of countries in complying with the international law norms (Wang Xiaofeng, 2017). The existing international treaties and regional treaties, some normative documents on the management of microplastic waste, are not well interpreted and applied among sovereign countries.

2.4 International Cooperation

Many countries use the oceans as a public sewage disposal site and a "garbage dump", and unregulated ocean dumping exacerbates the problem of marine microplastic pollution. When the United Nations, some international organizations, regional organizations, and non-governmental organizations work on environmental protection issues, they intentionally blur the contents of the conventions and normative documents on marine microplastics in order to attract more member states to agree with the contents of the documents, which greatly reduces the effectiveness of the treaties and normative documents. Although the importance of international cooperation is clearly pointed out in several conventions, the existing international and regional treaties are not very binding on countries, and the contents of the treaties are not well observed and implemented. Sovereign states, as the main subjects of international law, lack supranational organizations to bind and regulate the cooperation among

countries on the control of microplastics. An assessment of the existing governance framework for marine litter by the United Nations Environment Programme noted that marine litter governance does not adequately apply the precautionary principle and information interaction; regional seas programme contains binding and voluntary instruments adopted by 18 regions that are not harmonized. The lack of an international legal instrument mainly focused on marine litter governance has led to a fragmentation of national governance objectives and approaches, making it difficult to develop a globally harmonized approach and standards for monitoring and assessment (Yang Songying & Ding Xiaohui, 2022).

3. Proposals for the Prevention and Control of Marine Microplastics Pollution Under the Current International Law System

3.1 International Legally Binding Agreement on Microplastic Pollution

The United Nations Environment Assembly has developed some key steps in the global governance of marine litter and microplastic pollution, such as the precautionary approach, sustainable consumption and production, the polluter pays principle, and resource-efficient design and packaging. Existing international law can cover marine microplastics pollution through the interpretation of general provisions or the extension of the concept of "pollutant", but a convention specifically addressing marine microplastics pollution has yet to be proposed. On March 2, 2022, at the closing plenary of the resumed fifth session of the United Nations Environment Assembly (UNEA-5.2) in Nairobi, heads of state, environment ministers and other sector representatives from 175 countries approved a historic resolution to end plastic pollution, calling for a legally binding international agreement by 2024. Significant progress has been made in negotiations on an "international legally binding agreement to combat plastic pollution," including that tracing the entire life cycle of plastic products—from source to ocean—should legally binding, with support for developing countries, backed by a financing mechanism and strong tracking by a monitoring mechanism, and incentives for all stakeholders, including the private sector, to participate. Ms. Inger Andersen, Executive Director of the UN Environment Programme (UNEP), said that this is the most significant environmental multilateral deal since the Paris accord (UN NEWS, 2022).

The newly revised treaty should not only contain positive and directive contents, but also include certain pollution sanctions to enhance the implementation and effectiveness of the treaty. Under the framework of the United Nations, it is necessary to promote the conclusion of global and regional treaties, improve the supervision and management mechanism, clarify the jurisdiction and responsibility provisions, and ensure the effective implementation of the treaties. Although it is difficult to revise the convention on marine microplastics pollution or reach a relevant cooperation document in the short term, domestic legislation and policies of some countries are gradually improved, which can contribute to the revision and formulation of the convention at the international level. The issue of the application of international and domestic law should be considered more as a monism, helping to establish the primacy of strong norms of obligations in international law and enabling the development of weak norms of obligations based on state practice. Moreover, clarifying this monistic relationship will also help to resolve conflicts between international and domestic law and lead to the construction of a community (Zhang Xiangjun & Wei Hanbing, 2021).

3.2 Promoting International Cooperation in Marine Microplastic Pollution Control

The effective management of the marine microplastic litter problem requires a broad consensus and synergy in the international community, requiring not only strict control measures by sovereign countries and collective action by the international community, but also active action by other relevant actors such as international organizations, NGOs, enterprises and other actors. This requires the coordination of the United Nations or relevant international organizations to promote countries to reach a consensus on the management of microplastic pollution, and on the basis of the consensus to promote the international community to take collective action, only in this way can we effectively respond to the issue of plastic pollution. As different countries are at different stages of development, the number of plastic products used varies greatly among countries around the world. Kuwait, Germany, the Netherlands, Ireland and the United States, for example, are countries with a high per capita daily use of plastic products, and the per capita plastic use in these countries is more than 10 times the per capita use in countries such as India, Tanzania, Mozambique and Bangladesh. Therefore, while adhering to the principle of international cooperation, it is also necessary to take full account of the differences in indicators such as per capita plastic use and output of plastic waste in different countries, and to adopt different measures (Sun Kai, 2021). There is a need to harmonise norms on an international level and, possibly, to create a special convention establishing common standards for the reduction, prevention, and control of plastic pollution, and containing liability mechanisms for the environmental damage it causes (Daria Vasilevskaia, 2018). Global and regional governance urgently requires a global response to the product life cycle and regional plans, not only for common concepts, harmonized and consistent standards, and widely accepted control/monitoring methods, but also for consistency and continuity of adherence to existing mechanisms.

3.3 Maritime Community with a Shared Future

The political, economic and cultural differences among countries can make it difficult to reach an agreement on microplastic pollution management between countries, and the ability of countries to implement international environmental treaties also differs, and the many differences that exist in reality should be taken into account for specific analysis of certain problems. From the perspective of international practice, bilateral treaties are highly enforceable and have clear rights and responsibilities, which are conducive to the management of microplastic waste and the protection of marine environment, but the international community as a whole, the protection of marine environment depends on the joint efforts of everyone, the international rules of prevention mechanisms and pollution management mechanisms are indispensable. From China's perspective, taking advantage of the platform of "21st Century Maritime Silk Road", we should strengthen the cooperation between developed and developing countries linked by the One Belt One Road Initiative, and fully consider the current situations and people's needs in countries situated along the Silk Road. It is conducive to preventing and tackling marine microplastics pollution (Yang Zewei, 2021). Guiding by the concept of "Maritime Community with a Shared Future", countries should take immediate measures to prevent, reduce and control pollution of the marine environment through the recycling and circular economy model.

4. Conclusion

The problem of marine microplastic pollution has been around for a long time and has attracted the attention of the international community. It is not only harmful to marine life, but also poses a threat to human health. In terms of legal response, there are difficulties in legislation, allocation of jurisdiction and responsibility, interpretation and application of international law and domestic law, as well as the mechanism of international cooperation, which is due to the weaknesses of international law. The "A Community with a Shared Future" and "Maritime Community with a Shared Future" proposed by President Xi is a good solution to the non-traditional crisis—marine microplastic pollution. Under the guidance of the concept of "Maritime Community with a Shared Future", the legislative cooperation at global and regional levels can be rapidly promoted, countries can make proper arrangements in terms of jurisdiction and responsibility, international law can be more flexibly applied to domestic law, and the relevant provisions of domestic law on microplastic pollution and prevention can be improved. In addition, international cooperation can also be implemented.

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