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Research on the Global Marine Plastic Pollution Prevention and Control from the Perspective of International Law

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Abstract

The increasing marine plastic pollution seriously threatens the marine environment and ecosystem, human health and the global economy, attracting wide attention from the international community. Despite the continuous efforts and attempts made at the global and regional levels in the legal regulation of marine plastic pollution, there are still many legal dilemmas such as the fragmentation of marine plastic pollution legislation, the lack of legislative specificity, and the difficulty in the implementation of existing relevant international regulations. In this context, this paper seeks to explore ways to deal with global marine plastic pollution from three aspects: promoting the enactment process of the "Global Agreement on Plastic Pollution", coordinating hard laws and soft laws, and improving the implementation mechanism of marine plastic pollution prevention and control.

Keywords: marine plastic pollution, UNCLOS, legal regulation, soft law, hard law

1. Introduction

Long before the public became aware of the potential threats of plastics to marine ecosystems, the academic community had already discussed this topic. Initially, research mainly focused on plastics found on birds[1] and surface waters[2]. In the 1980s, the National Oceanic and Atmospheric Administration (NOAA) published a study that demonstrated the distribution of plastic waste in the North Pacific region between 1985 and 1988, outlining its characteristics. The phenomenon of higher concentrations of plastic waste in areas of oceanic circulation was discovered for the first time.[3] However, this discovery did not draw much attention at the time. It is undeniable that these persistent synthetic compounds do not naturally exist in nature, and the presence of human-made substances in aquatic environments essentially means that plastics are pollutants. Given the fundamental status of the ocean in the biosphere, if plastic waste is not effectively recycled and reused, it will ultimately flow into the ocean, making it an inevitable repository for global plastic waste.[4]

With reference to recent data, the growing scale of discarded plastics poses a significant threat to the global marine environment, and the public awareness of marine plastic pollution has notably increased. According to the report on marine plastic pollution by the International Union for Conservation of Nature (IUCN), at least 14 million tons of plastic waste enter the ocean each year, with marine plastic debris accounting for four-fifths of

[1] E J Carpenter, K L Smith, (1972). Plastics on the sargasso sea surface. *Science*, *175*(4027), 1240.

[2] E J Carpenter, S J Anderson, G R Harvey, et al., (1972). Polystyrene spherules in coastal waters. *Science*, *178*(4062), 749.

[3] R S Shomura, M L Godfrey, (1990). Proceedings of the Second international Conference on Marine Debris 2-7 April 1989, Honolulu. Hawaii. National Oceanic and Atmospheric Administration.

[4] Z Bolin, (2023). Research on International Legal Regulation of Global Marine Plastic Waste Governance. Dalian Ocean University, 6.

the total weight of global marine litter.[1] This highlights the severity of marine plastic pollution. Furthermore, marine plastic pollution will not only cause severe damage to marine biodiversity and ecosystems, but also result in substantial economic losses and ultimately threaten human health through the food chain. The international community is continuously deepening its understanding of the dangers of plastic pollution and has made numerous efforts and attempts in legal regulation. In light of this, this paper will examine the existing international legal regulations on marine plastic pollution, explore the legal challenges in addressing marine plastic pollution, and propose strategies for tackling the issue.

2. Global Status of Marine Plastic Pollution

2.1 Sources of Marine Plastic Pollution

For legislators and law enforcement authorities, identifying the sources of pollutants is a critical step in determining marine pollution legally. Marine plastic waste comes from two primary sources: land-based sources and ocean-based sources.[2]

2.1.1 Land-Based Sources

Marine plastic pollution originating from land is referred to as land-based pollution. These pollutants primarily enter the ocean through urban waste discharge[3], littering by coastal residents and tourists, river runoff, and coastal construction activities. Additionally, extreme events such as floods, storms, and tsunamis may transport large amounts of plastic debris from coastal areas to the ocean, causing significant accumulation of waste along riverbanks, coastlines, and estuaries. As shown in the preface, land-based sources account for 80% of total marine plastic waste, making it the primary contributor to marine plastic pollution.

2.1.2 Ocean-Based Sources

Plastic pollution originating from activities in the ocean is referred to as ocean-based pollution. Of this, 65% of ocean-based plastic waste comes from fishing activities, including discarded fishing gear, abandoned buoys, foam plastics, and household waste generated by fishermen. Due to prolonged periods of operation at sea, these waste materials often go unaddressed and are eventually discharged into the ocean, causing significant pollution. Additionally, 35% of ocean-based plastic waste is attributed to shipping activities, including waste generated from ship repairs, loss of coating materials during regular navigation, and garbage produced by crew members.[4] Moreover, maritime accidents such as ship collisions or container losses can lead to large quantities of plastic products sinking into the sea, further exacerbating the marine plastic pollution problem.

2.2 Impacts of Marine Plastic Pollution

With the rapid increase in plastic demand and improper management of plastic waste, plastic and microplastic pollution have become global environmental issues. According to a UN report,[5] marine plastic pollution poses an increasing threat to ecosystems spanning from the rivers to the ocean, human health, and the global economy.

2.2.1 Ecosystems

In its 2024 Global Waste Management Outlook, the United Nations Environment Programme (UNEP) emphasized the negative impacts of plastic pollution on both biotic and abiotic environments.[6] These impacts are both visible and invisible. The visible impacts refer to the direct harm caused by microplastics to marine organisms, such as ingestion by animals. Marine animals like seabirds, sea turtles, and whales often mistakenly consume plastic fragments as food, leading to internal injury, poisoning, and death. Large plastic items, such as

[1] IUCN, (2024). Issues Brief — April 2024 Marine Plastic Pollution. https://iucn.org/sites/default/files/2024-04/marine-plastic-pollution-issues-brief_nov21-april-2024-small-update.pdf. Accessed 1 March, 2025.

[2] A Lihui, L Huan, W Feifei, D Yixiang, X Qiujin, (2022). International Governance Progress in Marine Plastic Litter Pollution and Policy Recommendations. *Research of Environmental Sciences*, *35*(06), 1335.

[3] United Nations Environment Programme, (2021). From Pollution to Solution: A global assessment of marine litter and plastic pollution. Synthesis. Nairobi.

[4] L Bin, H Li'an, W Yuan, M Wenchao, Y Beibei, L Xiangping, C Guanyi, (2020). Emission Estimate and Countermeasures of Marine Plastic Debris and Microplastics in China. *Research of Environmental Sciences*, *33*(01), 175.

[5] United Nations Environment Programme (2021). From Pollution to Solution: A global assessment of marine litter and plastic pollution. Synthesis. Nairobi.

[6] The definition includes the leakage and accumulation of plastic objects and particles that can adversely affect humans and the living and non-living environment. United Nations Environment Program, (2024). Global Waste Management Outlook 2024: Beyond an age of waste — Turning rubbish into a resource. Nairobi.

fishing nets and gear, can also entangle animals, preventing them from living and feeding normally. The invisible impacts involve the transmission of microplastics through the food chain to a broader range of organisms, causing collective harm with the potential for widespread damage. For instance, chemicals in plastics may leach into the water, interfering with the reproduction, immune systems, and growth of organisms, thus broadly harming aquatic life and disrupting marine biodiversity.

Additionally, plastic debris can act as a buoyant object, aiding species in migrating from one location to another. This can lead to species invasions or cause some species to proliferate excessively, triggering a collapse of the ecological chain and causing imbalance in local ecosystems, which ultimately damages the entire ecological system. UNEP has passed the resolutions on Marine Plastic Litter and Microplastics[1], pointing out that the growing accumulation of plastic waste in the oceans is continuously threatening marine ecosystems, causing economic losses of up to $13 billion annually to global marine ecosystems.

2.2.2 Human Health

Most plastic degradation products, such as microplastics and chemical additives, have been confirmed to be toxic and pose significant health risks to humans. Microplastics can enter the human body through inhalation and absorption via the skin, accumulating in organs such as the placenta. Humans ingest microplastics through consumption of marine life, including fish, shrimp, and shellfish. The ingestion of microplastics may lead to alterations in human chromosomes, posing a major threat to human reproductive health and longevity.[2]

2.2.3 Global Economy

Marine debris and plastic pollution have a profound impact on the global economy, with significant effects on the shipping industry, marine fisheries, and tourism. In the shipping industry, marine plastic waste can entangle propellers or clog intake valves, leading to operational failures and increased ship maintenance and operational costs. Given the known effects of marine plastic waste on human health, there may be a reduction in the consumption of marine products, which would negatively impact the marine fishing industry. The accumulation of plastic waste reduces the aesthetic value of the marine environment, damages beach landscapes, and, in turn, affects tourism revenues. According to reports, in 2018, global marine plastic pollution caused an estimated economic loss of at least $6-19 billion, affecting industries such as tourism, fishing, and aquaculture, along with other costs like cleanup efforts. It is projected that by 2040, if governments require companies to cover waste management costs based on expected quantities and recyclability, companies could face financial risks of up to $100 billion annually. Additionally, large amounts of plastic waste may lead to an increase in illegal domestic and international waste disposal activities.[3]

3. Marine Plastic Pollution Governance from the Perspective of International Law: Current Status and Challenges

3.1 The International Legal Regime Regulates Marine Plastic Pollution in a Broad Sense

Since the 1970s, the international community's understanding of the negative impacts of plastic pollution on human society and the natural environment has gradually become clearer and more profound. The international legal regime embodied as international treaties, soft law documents, and regional agreements provides legal foundations for the prevention and control of marine plastic pollution in a broad sense.

3.1.1 International Treaty Law

Binding conventions, agreements, and other legal texts are important sources of international law and form the legal basis and support for international governance. The treaty law governing the global marine plastic pollution includes the following: 1) The Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (the London Convention) and the London Protocol. These agreements provide a macro-level framework for preventing the dumping of waste, plastics included, into the ocean, using the precautionary principle to effectively control the source of microplastic pollution. This forms a strong international legal basis for pollution prevention. 2) The International Convention for the Prevention of Pollution from Ships (MARPOL 73) and its 1987 Protocol (MARPOL 78). This convention aims to eliminate intentional discharges of oil and other harmful substances into the ocean and minimize unintentional releases. MARPOL 78 recognizes the need for universally applicable regulations that go beyond oil pollution, addressing all forms of marine pollution from or caused by ships. Annex V of MARPOL 78 categorizes plastic waste as a type of ship-generated garbage and adds

[1] United Nations Environment Program, (n.d.). https://wedocs.unep.org/bitstream/handle/20.500.11822/32238/UNEAML_ch.pdf. Accessed 5 March 2025.

[2] C M. Boerger, G L. Lattin, S L. Moore, C J. Moore, (2010). Plastic ingestion by planktivorous fishes in the North Pacific Central Gyre. *Marine Pollution Bulletin*, *60*(1), 2275.

[3] UN News, (2021). Plastic pollution on course to double by 2030. https://news.un.org/en/story/2021/10/1103692. Accessed 5 March 2025.

provisions to ban the disposal of ship-generated waste at sea.[1] The revised Annex V, in 2016, specifically categorizes plastic as Category A ship waste and recognizes it as a substance harmful to the marine environment.[2] This provision applies to all types of ships and strengthens the management of plastic waste from ships from the perspective of international law, preventing the further spread of marine plastic pollution and reducing the environmental harm caused by plastics to some extent. However, it is important to note that only Annex I and Annex II of MARPOL 73/78 are currently in force, while Annex V has not yet come into effect. 3) The 1982 United Nations Convention on the Law of the Sea (UNCLOS). Although UNCLOS does not have direct provisions addressing marine plastic pollution, Part XII (Protection and Preservation of the Marine Environment) encourages states to exercise due diligence to prevent and control marine pollution, including plastics, thus providing an international legal basis for marine plastic pollution governance. 4) The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (the Basel Convention). This convention promotes the environmentally sound management of hazardous and other wastes.[3] It primarily addresses the scope of hazardous waste,[4] which includes the plastic waste treatment, thus indirectly contributing the reduction of marine plastic pollution. 5) The Stockholm Convention on Persistent Organic Pollutants, which bans the production and use of certain plastic products (the Stockholm Convention).[5] In summary, the international legal framework has made significant progress in providing legal tools to regulate marine plastic pollution. However, challenges remain in ensuring the full implementation and enforcement of these provisions, and further efforts are required to strengthen global governance in this area.

3.1.2 International Soft Law Instruments

Compared with “hard law”, “soft law” is instructive and flexible, with initiatives, action plans, resolutions, declarations and other non-legally binding documents as the main form of expression. Although it is not mandatory for national implementation, its regulatory effects can be similar to those of hard law, influencing behavior and setting standards. In the governance of global marine plastic pollution, soft law is represented by instruments adopted by major international conferences, state groups, and industry-based international organizations.

Early soft law instruments only address marine plastic pollution as one of the elements of broader marine environmental regulations. For example, the 1995 Global Program of Action for the Protection of the Marine Environment from Land-Based Activities (GPA) calls on countries to develop long-term action plans and implement effective measures to reduce and eliminate marine litter, including plastics and microplastics, as needed. The 2012 Honolulu Strategy: A Global Framework for Prevention and Management of Marine Debris (the Honolulu Strategy) details three goals[6] for reducing and controlling marine debris, and reviews MARPOL 73/78 Annex V. It encourages countries to take active steps under MARPOL 73 and its protocol to reduce the generation and harmful impacts of marine litter, providing specific recommendations for tackling marine plastic pollution.

In 2015, the UN Resolution[7] titled “Transforming Our World: The 2030 Agenda for Sustainable Development” offers guidance and overall objectives for marine plastic pollution prevention. This resolution highlights sustainable development goals, including measures to combat marine pollution and specifically addresses plastic waste as part of global sustainability efforts.

In recent years, specialized soft law instruments on marine plastic pollution have emerged. Notably, the four resolutions on Marine Plastic Waste and Microplastics adopted during the first to fourth UN Environmental Assemblies (UNEA) urge countries to proactively adopt measures from the perspective of the entire product lifecycle of plastic products, emphasizing strategies to reduce plastic pollution at all stages, from production to disposal. These soft law instruments play an important role in guiding global efforts, although they lack the binding force of formal treaties. Nevertheless, they contribute significantly to setting norms, raising awareness,

[1] The London Protocol, annex V, art 3.

[2] The London Protocol, annex V, appendix I.

[3] The Basel Convention, preamble.

[4] The Basel Convention, art 1.

[5] The Stockholm Convention, annex A.

[6] The three goals: Goal A — Reduced amount and impact of land-based sources of marine debris introduced into the sea; Goal B — Reduced amount and impact of sea-based sources of marine debris, including solid waste; lost cargo; abandoned, lost, or otherwise discarded fishing gear (ALDFG); and abandoned vessels, introduced into the sea; Goal C — Reduced amount and impact of accumulated marine debris on shorelines, in benthic habitats, and in pelagic waters.

[7] UN General Assembly Seventieth session, (2015). Transforming our world: the 2030 Agenda for Sustainable Development(A/RES/70/1).

and encouraging actions to mitigate marine plastic pollution.

3.1.3 Regional Treaties and Documents

Region is one of the central perspectives in the study of global governance, where neighboring countries in the same region often face similar environmental problems and tend to work closely together.

The region early focusing on marine plastic pollution is Europe. 1974, the seven Baltic countries signed the Convention on the Protection of the Marine Environment of the Baltic Sea Area (the Helsinki Convention), which is the first international multilateral treaty encouraging the use of integrated measures of prevention and control to protect the marine environment in the region.[1] Its amendment prohibits the dumping of all ship-based plastics into the sea under the Convention, including synthetics such as cables and nets, as well as plastic products such as garbage bags. This regulates at source the prevention and control of marine plastic pollution in the Baltic Sea. The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) redefines the concept of "dumping"[2] and establishes the precautionary principle[3] and the scientific principle[4], requiring member states to refrain from the intentional (excluding accidental) dumping of plastic debris into the ocean, and promoting the development of technologies and practices to prevent marine plastic pollution with specific and clear legal guidance.

With the trend of integration in Southeast Asia and the environmental consequences of economic development, the Southeast Asian region is increasingly emphasizing the prevention of marine plastic pollution. Since 2017, ASEAN has successively issued the Statement on Combating Marine Plastic Debris,[5] the Bangkok Declaration on the Combating Marine Debris in ASEAN Region,[6] the ASEAN Framework of Action on Marine Debris,[7] the East Asian Seas Regional Action Plan on Marine Litter,[8] and the ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States (2021-2025),[9] calling on stakeholders to collaborate, strengthen plastic assessment monitoring technology research, raising public awareness of environmental protection, and so on. These documents fully reflect the ASEAN region's determination and solidarity in addressing marine plastic pollution.

3.2 Existing Legal Frameworks Are Insufficient to Address Global Marine Plastic Pollution

3.2.1 Lack of a Systematic Legislation on Marine Plastic Pollution

As examined earlier, international legal regulations on marine plastic pollution often focus on specific areas of pollution. For example, the Basel Convention primarily deals with the transboundary movement of hazardous waste, MARPOL 73/78 and its protocol mainly regulate pollution from ships and offshore oil platforms, and the Stockholm Convention only partially addresses the production, import, and use of certain plastics. The lack of a comprehensive and integrated legal framework means that these fragmented treaties may conflict with or fail to align with other conventions in terms of legislative goals and objectives. The fragmented nature of these regulations leads to gaps in addressing marine plastic pollution, resulting in enforcement challenges, conflicts in rule application, and an inability to apply a holistic regulatory approach.

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[1] W Hui, H Jing, (2011). Regional legal framework for prevention and control of terrigenous Marine environmental pollution. *Ocean Development and Management*, *5*(1), 64.

[2] OSPAR, art 1.

[3] OSPAR, art 2.

[4] OSPAR, annex I, "best practice" and "best available technologies".

[5] East Asia Summit Leaders' Statement on Combating Marine Plastic Debris, (2018). https://asean.org/wp-content/uploads/2018/11/EAS_Leaders_Statement_on_Combating_Marine_Plastic_Debris.pdf. Accessed 16 March 2025.

[6] Bangkok Declaration on Combating Marine Debris in ASEAN Region, (2019). https://asean.org/speechandstatement/bangkok-declaration-on-combating-marine-debris-in-asean-region-2/. Accessed 16 March 2025.

[7] ASEAN Framework of Action on Marine Debris, (2021). https://asean.org/wp-content/uploads/2021/01/3.-ASEAN-Framework-of-Action-on-Marine-Debris-FINAL.pdf. Accessed 16 March 2025.

[8] Action plan on marine litter is agreed for South-East Asia, (2019). https://www.sea-circular.org/news/action-plan-on-marine-litter-is-agreed-for-south-east-asia/. Accessed 16 March 2025.

[9] ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States (2021-2025), (2021). https://asean.org/book/asean-regional-action-plan-for-combating-marine-debris-in-the-asean-member-states-2021-2025-2/. Accessed 16 March 2025.

3.2.2 Insufficient Specialized Legislation on Marine Plastic Pollution

The vacuum in regulatory rules will inevitably lead to the lack of a complete system of marine plastic pollution governance and a structural shortage of marine plastic pollution governance activities.[1] The biggest challenge facing global ocean governance at present is the mismatch between the supply of public products and the demand for them, especially the insufficient number of institutional public products such as treaties and conventions.[2] In the field of global marine plastic pollution governance, there is also a lack of specialized legislation. Although UNCLOS provides for principle-based provisions on marine pollution from land-based sources, the problem of marine plastic pollution is more complex due to the special nature of its basic attributes, and its pollution management is likely to involve multiple regions and countries, while most of the current international treaties regulating marine plastic pollution lack detailed provisions on the handling of controversial issues, such as specific means of treatment, preventive measures, monitoring and review standards, etc. In addition, there is currently no specialized legislation to specifically deal with remediation and compensation for environmental damage caused by marine plastic pollution, lacking clear mechanisms for prevention, accountability and compensation.

3.2.3 Difficulties in Enforcement and Limited Effectiveness of International Legal Instruments

International soft law instruments, such as the 2030 Agenda for Sustainable Development and the Honolulu Strategy, have no legal binding force and thus depend on the voluntary compliance of party states and regions. The role of these soft law instruments in addressing marine plastic pollution is limited. Compared with other environmental regulations, these soft law instruments lack binding targets and mandatory timelines for reducing plastic pollution.[3]

International hard law treaties, due to their limited scope of application, still have limited regulatory effectiveness in combating global marine plastic pollution. For example: 1) MARPOL 73/78 and its Protocol V, along with the London Convention and its protocol, while somewhat successful, mainly focus on ship-based pollution, which constitutes only a small fraction of global plastic pollution. Therefore, these treaties fail to address the broader issue of marine plastic pollution, especially when considering the entire plastic lifecycle. 2) UNCLOS Article 194 requires countries to take measures to prevent, reduce, and control marine pollution, but plastics are included in the list of specific types of pollution to be combated by States only if they are toxic, hazardous and an obstacle to health. Article 207 obligates the States to adopt laws and regulations to prevent, reduce and control marine pollution from land-based sources but internationally agreed rules, standards and recommended practices and procedures shall be taken into consideration. Despite the UNCLOS's sophisticated compliance mechanism through the International Tribunal for the Law of the Sea, the lack of specificity on plastic pollution means that it is not effective enough and cannot fundamentally address the growing issue of marine plastic pollution.

Furthermore, other potentially applicable legal instruments have not been widely ratified or are limited in scope, applying only to certain chemicals used in plastic production or specific types of plastic deemed hazardous. International legal-binding instruments aimed at protecting specific species or biodiversity may apply to marine plastic pollution but often lack enforceable provisions regarding plastic-related clauses. While there have been calls to further develop existing binding treaties, like the Basel Convention, to specifically address plastics, or to incorporate plastics into instruments now on negotiations, these attempts may not provide a comprehensive legal solution.

4. Constructing a Global Legal System for Marine Plastic Pollution Prevention

4.1 Advancing the Development of an International Legally Binding Instrument — The "Global Agreement on Plastic Pollution"

Plastic pollution is ubiquitous, persistent, and has transboundary impacts, making its regulation a new global challenge. While the international community has made efforts to address plastic pollution at the global level, significant gaps remain between these efforts and the intended goals. Currently, there is no global legal instrument specifically designed to regulate or manage marine debris. In other words, there is no agreement that comprehensively deals with plastic pollution covering its lifecycle from raw material extraction, plastic polymer

[1] L Zhiwen, K Yongli, (2024). Advancement in the international legal regulation on the marine plastic pollution and China's participation. *Journal of Hainan University (Humanities & Social Sciences)*, *42*(05), 36.

[2] C Ye, W Qi, (2019). The Dilemma of Global Ocean Governance in the Perspective of Global Public Goods: Phenomenon, Cause, and Solution. *Pacific Journal*, *27*(01), 62-64.

[3] G Carlini, K Kleine, (2018). Advancing the international regulation of plastic pollution beyond the United Nations Environment Assembly resolution on marine litter and microplastics. *RECIEL*, *27*, 237.

and additive design and usage, to final disposal and treatment.[1] However, at the 5th UN Environment Assembly in 2023, the resolution titled "End plastic pollution: Towards an international legally binding instrument" was adopted,[2] calling for the establishment of an intergovernmental negotiating committee to draft a legally binding global treaty to end plastic pollution by 2024. While the final name of this agreement has not been determined, this paper refers to it as the "Global Agreement on Plastic Pollution". This agreement is envisioned to address the entire lifecycle of plastics, including the design of reusable and recyclable products and materials, and the need for enhanced international cooperation to facilitate access to technology, capacity building, and scientific cooperation thus ending plastic pollution, reducing plastic leakage and contamination in the ecosystems, including marine environments.

Currently, the negotiations surrounding the Global Agreement on Plastic Pollution have sparked intense debates. Key issues include whether it should cover the entire lifecycle of plastics. This paper argues that, given the deterioration of the marine plastic pollution and the rapid increase in marine debris, the development of a legally binding Global Agreement on Plastic Pollution is urgently needed to fill gaps in existing regulations. This agreement should combine the flexibility of soft law with the enforceability of hard law to effectively strengthen global efforts in preventing marine plastic pollution.

4.2 Emphasizing the Coordination and Synergy Between Hard Law and Soft Law

International law governing marine plastic pollution includes legally binding "hard law" and non-binding "soft law". Both have distinct areas of application and regulatory advantages, with each complementing and promoting the other. Specifically, 1) When the time is ripe, political declarations, initiatives, resolutions, and other expressions of international consensus can be transformed into binding customary law or incorporated into formal international legal agreements. The Global Agreement on Plastic Pollution is a key example of this shift, moving from the soft law framework of the four resolutions on marine plastic debris and microplastics to the hard law instrument of "Ending Plastic Pollution: Towards a Legally Binding Instrument". This process is a result of recognizing the limitations of existing regulations and the need to establish a legally binding framework to mitigate marine plastic pollution. 2) Drawing from the amendment process of the Basel Convention, there is potential to introduce new clauses restricting marine plastic waste in higher-level international legislative instruments. For instance, future amendments to the UNCLOS could incorporate specific provisions on plastic waste under its existing section on land-based pollution. Such revisions would ensure that hard law evolves with the current environmental challenges posed by plastic pollution, further strengthening its enforcement and applicability. 3) The synergy of both hard law and soft law can provide a powerful international legal toolkit for the regulation and management of marine plastic pollution. To illustrate, hard law instruments have significant legal enforceability, effectively protecting the marine environment through explicit provisions, which can serve as the main approach to marine plastic governance. Soft law, on the other hand, provides flexibility and allows countries or regions to tailor their plastic pollution management strategies according to their specific circumstances. This flexibility ensures that local conditions are addressed while still contributing to global goals. By coordinating the hard law and soft law approaches, the international legal system can strike a balance between binding regulations and adaptive policies that encourage voluntary action, while also ensuring effective implementation and enforcement. The collaborative use of both legal frameworks can better address the diverse challenges of marine plastic pollution, ensuring that it is tackled comprehensively and efficiently.

4.3 Improving the Implementation Mechanism for Marine Plastic Pollution Prevention

International practice shows that the greatest challenge the international community faces is not the lack of capacity or feasibility to introduce targeted legislation, but rather the difficulty in ensuring that existing international legal rules are effectively implemented and that the goals are realized. Therefore, in addition to considering the development of international legislation on marine plastic pollution, the international community must also focus on improving the corresponding enforcement mechanisms. Specific and feasible approaches include 1) Establishing international cooperation mechanisms and multilateral arrangements. Global and regional multilateral cooperative arrangements should encourage countries to cooperate in sharing information, technology, best practices, and experiences, and to build open, inclusive, and mutually supportive partnerships with non-state actors (such as international organizations) to enhance states' compliance level. 2) Constructing a comprehensive compliance mechanism with a combination of compulsory measures and facilitative method. Compulsory measures typically include accountability of stakeholders, liability for damages, and sanctions for breaches of agreements. Facilitative methods focus on incentives, such as promoting compliance, enhancing

[1] UNEP, (2018). Combating Marine Plastic Litter and Microplastics: An Assessment of the Effectiveness of Relevant International, Regional and Subregional Governance Strategies and Approaches (UN Doc UNEP/AHEG/2018/1/INF/3), 12.

[2] United Nations Environment Assembly of the United Nations Environment Programme Fifth session, (2022). End plastic pollution: Towards an international legally binding instrument (UNEP/EA.5/L.23/Rev.1).

transparency (e.g., through information disclosure and sharing), and establishing reporting procedures (e.g., regular reporting). These measures encourage countries to take proactive actions in reducing plastic pollution. By combining both compulsory and facilitative approaches, a comprehensive enforcement mechanism can be established, ensuring the effectiveness of international regulations on marine plastic pollution and all parties' joint efforts to address the global plastic pollution crisis.

5. Conclusion

Marine plastic pollution is a global, complex, and multifaceted issue that requires global consensus and collective action from all nations. It wasn't until the 1970s that countries recognized the profound negative impact plastic pollution was having on human societies and the natural environment. To date, there is still no dedicated international legal instrument specifically governing plastic pollution. The international community is still grappling with the fragmentation of marine plastic pollution legislation, the lack of a specialized legal framework, and difficulties in enforcing existing regulations. Therefore, in the context of international law, in order to effectively end plastic pollution, there is an urgent need to accelerate the adoption of an international legally binding instrument, the Global Agreement on Plastic Pollution. It is important to focus on the coordination and synergy between hard law and soft law, and improve the implementation mechanisms for marine plastic pollution prevention and control. This can be achieved by establishing international cooperation mechanisms and multilateral arrangements, as well as promoting a comprehensive compliance system. These steps will collectively contribute to strengthening the global legal framework for marine plastic pollution prevention and ensuring effective action to address the global plastic pollution crisis.

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