

The Relationship of International Trade Law and International Environmental Law: Using Marine Law as the Point of Contact

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Abstract. This paper examines the intersection of international trade law and international environmental law, with a particular focus on marine law as a critical point of contact. It explores the current utilization and protection of marine resources within the context of international trade, highlighting the significant environmental impacts and governance challenges that arise. The paper provides a comprehensive analysis of existing international treaties and agreements, their implementation processes, and the limitations faced by international institutions in resolving conflicts effectively. Through an in-depth examination of key international agreements such as UNCLOS, the Paris Agreement, and the Montreal Protocol, the paper identifies gaps and challenges in the current framework. It emphasizes the need for improved coordination and cooperation among nations to balance economic development with environmental sustainability. The paper also offers practical recommendations for enhancing international trade and environmental laws. These include integrating clear environmental standards into trade agreements, setting phased environmental targets, and formulating specific international treaties for the sustainable management of marine resources. Additionally, it calls for the establishment of robust enforcement mechanisms and the promotion of technological advancements in environmental protection. By addressing these critical issues, the paper aims to contribute to a more sustainable and equitable global governance system for marine resources.

Keywords: International trade; marine law; environmental standards; global governance; sustainable development.

1. Introduction

Nowadays, with the development of world economy, the multi-national trade has become increasingly popular. On the course of globalization, people's awareness of protecting environment also have gained a lot. However, in some situation, the environmental damage seemed to be inevitable, especially during the process of sea transportation. International trade relies heavily on maritime transport, which is responsible for the majority of global trade in goods. Almost 95% of global commodity is carried out by sea. At the same time, maritime transport is a significant source of marine pollution, including oil spills, ballast water discharge, and emissions from ships. These types of pollution are characterized by multiple and complex sources, strong persistence, rapid and widespread diffusion. Addressing this issue involves multiple stakeholders and requires joint cooperation among different regions and countries. Balancing the need for efficient international trade with the imperative to protect the marine environment poses a complex challenge. This intersection provides a rich area of study due to the shared concerns over resource management, environmental protection, and sustainable development. During the last 3 years, because of the Covid-19, the shipping ways are seriously struck and the number of cross-sea trade as decreased. Hence, in the post-epidemic era, refocusing on sea resources has great significance in promoting the reawakening of continual global maritime.

Furthermore, the extraction of marine resources, including seabed mining and offshore oil and gas drilling, highlights the intersection of trade and environmental concerns. These activities are governed by both trade agreements and environmental regulations to ensure that resource exploitation does not lead to environmental degradation. Because of in importance of shipping, choosing the sea of law as the point cut is a wise decision. It could be a typical and influential aspect in the whole field of law system, which has tight connection with human's daily life as well. What's more, as the main natural

constituent part of the earth, which cover over 70% of the Earth's surface, not only does the sea mean a lot in commodity transaction, but it also influences the health, politics and other industries, which regulate maritime boundaries, navigational rights, and resource management, ensuring equitable access and sustainable use. That's why the marine environment always catch the public's attention. Therefore, based on the worldwide attach importance to the sea, improving and completing the law of sea is merited. A nice condition of sea requires the balance of the use of Marine resources and protecting the natural environment. On the one hand, people need to transport goods by sea, fish for aquatic animals and plants as food or merchandise. On the other hand, it is human being's duty to protect the Earth. That's why when discussing the relationship of the trade and environment, the sea is chosen as the point cut.

The paper is divided into 5 parts. After the organization, the current situation and dilemma are mentioned, which aim at expounding the use of sea resources in international trade and the protection measures in environmental law. Then, the deep analysis is given by stating the dilemma and challenge in the international law system and using some typical cases to assess and criticize the current laws or regulations. In the following paragraph, measures of improving international trade law and international environmental law. Finally, the conclusion and expectation towards future are raised.

2. Current Situation and Dilemma

2.1. Current Situation of the Utilization of Marine Resources in International interaction

As the increasingly deep discovery of the natural attributes and social values of the ocean, the sustainable development and utilization of marine resources are becoming an important way for humans to address the depletion of terrestrial resources. The biological resource is the main aspect in international trade and mainly discussed here. Since 2013, in terms of trade value, salmon and trout have consistently been the most important trade commodities. In 2018, the trade value of salmon accounted for about 19% of the total international trade value of aquatic products. During the same period, other major export species were shrimp and prawns, accounting for about 15% of the total trade value, followed by groundfish (including hake, cod, haddock, and pollock) at 10%, and tuna at 9%. In 2018, fishmeal accounted for about 3% of the total export value, and fish oil for 1% [1].

In recent decades, international trade in fisheries and aquaculture products has significantly increased, expanding across continents and regions. In 2020, excluding algae, global exports of fishery products reached \$151 billion, a 7% decrease from the historical high of \$165 billion in 2018. Fishery product trade in 2020 accounted for 11% of the total agricultural trade (excluding forestry) and approximately 1% of total merchandise trade. In many countries, this proportion is even higher. For example, in Cape Verde, Iceland, Kiribati, and the Maldives, fishery product trade accounts for over 40% of total merchandise trade [2].

With the further development of utilizing the oceans, global marine ecological security also faces new types of challenges. Firstly, overfishing and illegal fishing lead to the depletion of marine resources and the reduction of biodiversity. In recent years, large-scale overfishing has led to a severe decline in fishery resources. With the continuous development of marine fisheries, the number of fishing vessels in various sea areas is increasing, their performance is improving, fishing efficiency is rising, and marine catch production is increasing, leading to a significant increase in the value of marine fisheries. Secondly, marine pollution is becoming increasingly serious. Pollution from plastics, oil spills, wastewater discharge, and other sources poses a significant threat to marine life and ecosystems. Plastic pollution is chosen as an obvious example. In 1997, a historic event occurred when Captain Moore from the Algalita Marine Research Foundation, while sailing back to Los Angeles from Hawaii, discovered a large number of plastic debris in the North Pacific, drawing significant attention. This discovery led to the identification of the famous Great Pacific Garbage Patch. In 2004, Richard Thompson proposed the concept of "micro plastics," bringing the issue of marine micro plastic pollution into public awareness. It is estimated that there are over 5 trillion pieces of plastic floating in the oceans, with most surface plastic debris accumulating in the five major ocean

gyres. The distribution density of marine plastic debris and microplastics is mainly concentrated in densely populated areas, showing similar pollution patterns [3].

2.2. The Current Situation of Marine Protection in International Environmental Law

2.2.1. Global Ocean Governance Framework and Key Agreements

Global ocean governance relies on numerous organizations, treaties, and policy processes, covering a wide range of issues and domains. These operate at various levels and have different guiding principles. For instance, the governance framework concerning the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (BBNJ) [4].

Table 1. Main agreements and relevant governance institutions related to BBNJ conservation and sustainable utilization

Agreement Name	Abbreviation	Full Name	Governance Institution	The Number of Contracting countries
Global Framework Agreement	UNCLOS	United Nations Convention on the Law of the Sea (UNCLOS)	DOALOS	166 (including EU)
Global sectoral agreements, especially focusing on the management of marine natural resource development and maritime activities	PartXI Agreement	Agreement on the Implementation of Part XI of the United Nations Convention on the Law of the Sea, adopted on December 10, 1982."	ISA	145
	UNFSA	Agreement relating to the Implementation of Part VII of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks."	Regional Fisheries Management Organization/ Agreement and Flag State Implement the Agreement	81
	MARPOL and other agreements related to vessels	International Convention for the Prevention of Pollution from Ships and Other agreements related to vessels	IMO	74
	LC/LP	1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter."	The Secretariat under the IMO	87(LC) 45(LP)

	ICRW	International Convention for the Regulation of Whaling	IWC	88
Global conservation agreements, connected with protecting animals, habitats and/or biodiversity	CITES	Conservation on International Trade in Endangered Species of Wild Fauna and Flora	Autonomous Secretariat	178
	CMS	Convention on the Conservation of Migratory Species of Wild Animals	Secretariat under the United Nations Environment Programme (UNEP)	119
	CBD	Convention on Biological Diversity (CBD)	Secretariat under UNEP	193 (including EU)
	WHC	Convention concerning the Protection of the World Cultural and Natural Heritage	Secretariat under UNESCO	190
Regional Agreements	RFMO/As	Regional Fisheries Management Organization/Agreement	ABNJ: there are five regional fisheries agreements for tuna (along with one dolphin agreement), as well as nine regional fisheries management organizations and two fisheries commissions. Some of these are supervised by the Food and Agriculture Organization of the United Nations (FAO).	/
	RSA/Ps	Regional Ocean Agreement/Program	Currently, there are four regional ocean agreements/programs that extend to areas beyond national jurisdiction (ABNJ): the Mediterranean (Barcelona Convention), Northeast Atlantic (Oslo Convention), South Pacific (Nouméa Convention), and Antarctic (Convention for the	/

			Conservation of Antarctic Marine Living Resources).	
	CCAMLR/ATS	Convention for the Conservation of Antarctic Marine Living Resources and Antarctic Treaty System	This convention is managed by the same-named commission and is part of the Antarctic Treaty System.	36

2.3. Challenges and Gaps in Marine Ecosystem Protection

Governance institutions with different natures operate at multiple levels. In addition to the global framework agreement UNCLOS, there are multilateral agreements targeting specific issues. Some lean towards marine development interests, while others favor marine protection interests. Regional Fisheries Bodies (RFBs) and Regional Fisheries Management Organizations (RFMOs) belong to the former. Many RFBs and RFMOs existed before the establishment of modern maritime law, and their mandates have not been fully updated to incorporate fisheries management tools based on transboundary populations, biodiversity conservation, the precautionary approach, or ecosystems [5]. Almost all RFMOs are primarily composed of countries with direct economic interests in fisheries. Many RFMOs represent commercial fishing interests, with conservation interests poorly represented in delegations. The participation of non-governmental organizations (NGOs) is often strictly limited, and there is insufficient representation of ecosystem-based interests.

In contrast to fisheries, some organizations and agreements are dominated by protectionist ideologies. The International Whaling Commission (IWC) is now a convention that tends towards the strict protection of whales. Various environmental NGOs and fisheries organizations have vastly different missions and project agendas. For example, Environmental Impact Assessments (EIA) are one of the four main elements of the BBNJ package plan being negotiated at the intergovernmental conference. The negotiations consider that the standards and procedures for conducting EIAs in areas beyond national jurisdiction (ABNJ) are fragmented, with significant differences in EIA obligations between sectors, regions, and sometimes within sectors. Therefore, a key goal of the BBNJ agreement is to harmonize the conduct of EIAs in ABNJ. Over the past 50 years, the number of conventions, treaties, and regulatory mechanisms dealing with the world's oceans has proliferated without any comprehensive plan [6].

The lack of effective enforcement mechanisms also leads to the regulatory power of global ocean governance being lower than expected. Without equipped enforcement procedures and complete compliance and enforcement mechanisms in practice, it is difficult to ensure that countries adhere to these principles. Years of government negotiations may end up as "empty treaties." Since 1882, 103 countries have signed 266 multilateral treaties related to marine resource management, but only 34 treaties (13%) have specific enforcement mechanisms [7]. A review of the Rio Declaration on Environment and Development in 2012 found that while some principles have been transformed into international laws or national instruments, some principles have not been implemented into meaningful actions. Generally, United Nations General Assembly resolutions are only recommendations for countries to implement, and many resolutions have resulted in almost no outcomes. For example, the General Assembly's annual resolutions on sustainable fisheries urge flag states to suspend vessel registration if they cannot control them, but this measure has proven ineffective. The abundance of agreements, lack of enforcement measures, absence of clear penalties for violations, penalties lower than the cost of non-compliance, and insufficient incentives for compliance all highlight significant flaws in the current institutional system. This predicament demonstrates a preference among states for non-binding goals or guidelines, allowing them to implement these goals without fulfilling concrete, unequivocal obligations.

In a word, the current predicament of global ocean governance is complex and intertwined, primarily due to incomplete international cooperation mechanisms. While numerous international marine laws and conventions, such as UNCLOS, exist, their implementation is hindered by the complexity of marine environments and differences in domestic laws, leading to varied applications. Additionally, there is a lack of information and technology sharing on cross-regional marine governance issues, such as pollution monitoring, fisheries, and energy. Differing interests and competitive relationships among countries further complicate governance, especially regarding maritime boundaries, fisheries resource allocation, and seabed mineral development. Furthermore, regulatory and enforcement capabilities are insufficient, particularly in developing countries, which lack the necessary resources for effective marine monitoring and patrols, resulting in gaps in the protection and sustainable management of marine ecosystems.

3. Contradictions and Challenges in the International Legal Framework

3.1. Conflict between Trade Liberalization and Environmental Protection

As globalization deepens, countries vigorously promote free trade while facing the challenge of balancing this with environmental protection to achieve sustainable development. International trade can lead to the plundering of global resources. At this stage, the development of many industries still requires a large amount of resources as a material basis. Developed countries often import natural resources from developing countries at low prices to protect their own resources, while many developing countries still rely on resource exports. Developing countries are in a passive position in resource exports, while developed countries, relying on their economic strength, lower prices, leading to a subtle phenomenon of resource plundering. Furthermore, developed countries engage in the transfer of environmental pollution [8]. They transfer some high-pollution industries to developing countries, and developing countries, eager for economic development, accept these high-pollution enterprises. In both cases, the apparent damage is only to the environment of developing countries, but due to the interconnectedness of the global environment, damage to specific environments will inevitably lead to global environmental deterioration. Global natural resources are finite, and the depletion of resources in any country poses a huge threat to global resources.

Environmental protection has a certain restrictive effect on international trade. Firstly, environmental protection increases product costs. Environmental standards set by countries lead to higher product costs, increasing consumer burdens and exerting a certain inhibitory effect on the freedom of trade. Secondly, environmental protection affects market access for products. Countries implement green trade barrier policies to protect their own environment, which can lead to trade frictions and impact free trade. Thirdly, countries allocate part of their fiscal investments to environmental protection, which inevitably reduces fiscal support for trade development.

3.2. Disputes over the Legal Ownership of Marine Resources

In the process of developing and utilizing marine resources, the rights to use these resources must go through a special administrative approval procedure. Many scholars simplistically believe that these rights originate from administrative permits, equating the registration of rights to use marine resources with the result of an administrative permit, thus conflating the two. Ultimately, this misunderstanding stems from a failure to clarify the nature of marine resource rights registration, which involves the issue of the relationship between the realization of state ownership and the intervention of public law. This issue requires further in-depth investigation. Clarifying the nature of marine resource rights registration is the basis and prerequisite for studying its distinguishing effects [9].

Before studying the registration of various marine resource utilization rights, it is necessary to clearly delineate the registration processes: approval, licensing, registration. Approval is a prerequisite for rights registration, and registration is an extension of the approval process. Meanwhile, in the utilization of marine resources, approval is not entirely equivalent to administrative licensing;

one could say that licensing is one of the contents of approval. The equivalence of the two requires meeting certain conditions, that is, they can be considered equivalent only when external approval or licensing-related approval items are met. In order to balance these two values in the process of utilization, administrative authorities have imposed constraints on the exercise of rights by rights holders—they must undergo approval, registration, and other processes to grant formal legitimacy to the utilization of marine resources.

3.3. The Role and Limitations of International Institutions in Conflict Resolution

After the World War II, the United Nation has played an important role in protecting the marine environment, especially in the formulation of international maritime law. Various international institutions such as the International Tribunal for the Law of the Sea, the International Seabed Authority, and the Commission on the Limits of the Continental Shelf have significantly enriched and developed the principles and rules of international maritime law [7].

Maritime dispute resolution bodies also have attracted significant attention in the development of international maritime law. Firstly, the advisory opinion function of the International Court of Justice has advanced legal methods for resolving international disputes. Then, the International Tribunal for the Law of the Sea represents an expansion of international dispute resolution mechanisms. In addition to advisory opinions, which serve as influential "soft law" with significant and far-reaching impacts on the development of international maritime law, its judgments also play a crucial role in establishing principles and rules of international law [8].

Additionally, international organizations play a significant role in conducting marine surveys and research while ensuring environmental protection. The ISA, for example, is tasked with promoting and coordinating marine scientific research, as mandated by Article 143, Paragraph 2 of UNCLOS. Since its establishment, the ISA has organized numerous seminars on deep seabed resources and environmental issues, emphasizing international cooperation in marine scientific research. This collaboration with the global scientific community and contractors aims to collect comprehensive deep seabed data, promoting joint scientific development and providing technical support.

However, despite these contributions, international institutions face several limitations in effectively resolving marine law conflicts. Enforcement mechanisms often rely on voluntary cooperation, leading to inconsistent application of international laws. The absence of a supranational authority complicates unified governance, resulting in fragmented efforts and varying degrees of compliance among nations [9].

Specialized agencies like ITLOS and ISA, while offering judicial and research avenues, are constrained by political dynamics and the decentralized nature of international governance. The participation of non-state actors, such as NGOs, is often limited, restricting diverse perspectives in decision-making processes. This limitation hampers the development of comprehensive and inclusive governance strategies.

Effective marine governance requires several improvements. Enhanced enforcement mechanisms are needed to ensure consistent application of international laws. Better coordination among international bodies is essential to streamline efforts and avoid redundant or conflicting regulations. Additionally, greater stakeholder involvement, including non-state actors, is crucial for incorporating a wide range of perspectives and expertise into the governance framework.

4. Optimized Path

4.1. Suggestions for Improving International Trade Law

4.1.1. Strengthen international cooperation and coordination

Nowadays, with the massive impact of the technology and international revolution spreading worldwide, an anti-globalization is surging accompanying the globalization process [10]. At the same time, the pressure brought by climate change and drastic changes in ecosystems, especially in the

marine environment, are arriving in succession, causing an unprecedented level of uncertainty and instability in the development of the international economic and political realms. The world is undergoing profound changes unseen in a century, accelerating in pace. However, cooperation and coordination are the best adhesive in international relations, and also the best way of promoting economy and improving natural environment.

Trade is a fundamental measure of economic development but also contributes to reducing environmental pollution and degradation. Countries can alleviate material shortages through international trade. For instance, island nations often lack arable land, leading to crop shortages. Rather than resorting to land reclamation, these nations typically import the crops they need, leveraging international trade as an economically and environmentally sustainable solution. Thus, international cooperation can simultaneously address economic and ecological concerns.

4.1.2. Enhance the weight of environmental provisions in trade agreements

In trade treaty, all members shouldn't ignore influences on the environment. An important method is setting clear environmental standards. There are some agreements, such as the Paris Agreement, the Montreal Protocol, and the Stockholm Convention, which can be adopted as the foundation for establishing environmental standards [11]. Based on this, constitutors are able to establish specific environmental indicators, such as greenhouse gas emission limits, concentrations of water and air pollutants, waste management, and recycling rates. Then, develop corresponding environmental standards for different industries (such as energy, manufacturing, agriculture, etc.) to ensure that each industry can effectively control its impact on the environment.

Given the diverse capacities and economic conditions of different countries, it is impractical to achieve all environmental goals simultaneously. Therefore, it is necessary to set short-term, medium-term, and long-term goals. These phased targets will allow countries to progressively achieve environmental objectives at different stages, ensuring a balanced approach to economic development and environmental protection.

Furthermore, trade agreements should include provisions for monitoring and enforcing these environmental standards. Establishing a robust monitoring mechanism will ensure compliance and accountability. Countries should agree on regular reporting and evaluation procedures to track progress and address any non-compliance issues. This approach will promote transparency and encourage nations to uphold their environmental commitments.

4.1.3. Formulate an international treaty specifically for marine resources

Marine resources have always been an irreplaceable part of all resources. Hence, formulating specific treaties have unquestionable importance. Traditionally, people have always considered ocean resources as natural resources created by nature without deeply contemplating their specific value. However, with the enhancement of human cognition, the understanding of ocean resources has also changed. Following the release of the "Ocean Blueprint for the 21st Century", the United States announced the "U.S. Ocean Action Plan," establishing new ocean policy objectives. Other countries have also begun to gradually develop maritime strategies and goals tailored to their national development, in order to better manage and exploit ocean resources [12].

It is worth noting that the concept of integrated ocean management involves improving the marine legal system. The issues in sea area management are closely related, so it is essential to consider them as a whole. Applying the concept of integrated ocean management is the only way to ensure the development and utilization of ocean resources [13]. What's more, the domestic applicability conditions of relevant international treaties should be improved, too. To align with global standards regarding ocean resources, the legal aspect is crucial. National legal norms need to be accepted as domestic laws to have a better impact on domestic legislation.

4.2. Recommendations for Improving International Environmental Law

4.2.1. Strengthen the international supervision mechanism and enforcement

Implementing a monitoring mechanism involves establishing an independent oversight and evaluation system. First, Establishing the independent oversight bodies, such as creating independent organizations or committees responsible for overseeing environmental protection measures. These bodies should be independent from political influence and have the authority to conduct inspections and evaluations objectively. Besides, the public should also participate in the mechanism. It is governments' duty to encourage and involve the public and relevant stakeholders in the monitoring process to ensure transparency and accountability. Publish monitoring reports, findings, and recommendations to promote transparency and encourage public engagement in environmental governance.

Compulsory measures make the monitoring system efficient. Ensure that non-compliance with environmental regulations is met with appropriate penalties and corrective actions. This may involve legal measures, fines, sanctions, or incentives to encourage compliance with environmental standards.

4.2.2. Promote the application of science and technology in environmental protection

In the era of high technology, methods of protecting environment become increasingly various. From an administration, with the development of informatization, attention should also be paid to its integration into improving the marine management system. Establishing a national or regional "Marine Cloud," enhancing information resource management and services, and compiling standards for collecting and managing marine data resources are crucial. It involves organizing data from various marine management departments, optimizing the marine system, and facilitating information exchange.

Technology can be used to advertise the concept of protecting the ocean to the public as well. Take VR as an example. Traditional marine conservation education is typically delivered through textbooks, images, brochures, or videos, with knowledge primarily presented in a one-sided manner, leading to low engagement levels among people. However, VR games break through the constraints of time and space, creating immersive oceanic worlds that enhance learners' motivation and creativity. By integrating marine conservation knowledge into games, learners are provided with immersive, interactive, three-dimensional, and realistic game scenarios and processes. This helps the public deeply understand the severity of ocean pollution, awakens national awareness of marine conservation, and encourages more people to participate in the ecological protection and governance of the oceans.

5. Conclusion

The relationship between international trade law and international environmental law is intricate, especially when viewed through the lens of marine law. The sustainable development and utilization of marine resources are essential for addressing the depletion of terrestrial resources. However, the complexities of marine environments, combined with differing national interests and inadequate enforcement mechanisms, present significant challenges.

International cooperation and coordination are paramount to achieving a balance between economic development and environmental protection. Clear environmental standards must be integrated into trade agreements, with phased goals to accommodate varying national capacities. The formulation of specific international treaties for marine resources is crucial, considering their irreplaceable value and the need for integrated management approaches.

Moreover, international institutions play a vital role in marine governance but face limitations due to political dynamics and the decentralized nature of global governance. Enhanced enforcement mechanisms, better coordination among international bodies, and greater stakeholder involvement are necessary for effective marine governance. By addressing these challenges, the international

community can ensure the sustainable use and protection of marine resources, contributing to global environmental sustainability and economic stability.

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