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A maritime community with a shared future: bridging fragmented legal regulations for marine plastic pollution

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Marine plastic pollution highlights the limitations of fragmented governance regimes. This study proposes the Maritime Community with a Shared Future (MCSF) as a framework to address this challenge. Through comparative legal analysis of treaty conflicts and case studies of the INC process, we demonstrate that the MCSF and the proposed global plastics treaty are designed to have a symbiotic relationship, rather than a competitive one. This research provides a negotiation pathway for the global plastics treaty.

KEYWORDS

Maritime Community with a Shared Future (MCSF), fragmented legal regulations, marine plastic pollution, marine plastic pollution governance, Community with a Shared Future for Mankind (CSFM)

1 Introduction

Plastic pollution has now become a global concern, with debris reaching all oceans worldwide, causing adverse effects on marine organisms, biodiversity, human livelihoods, and the economy (United Nations Environment Programme, 2014). Plastics constitute a significant portion of marine litter, with estimates suggesting that over 11 million metric tons of plastics enter the oceans annually. Plastic waste, ranging from microplastics to large debris, continues to accumulate in marine environments, posing severe threats to ecosystems. These threats include entanglement and ingestion by marine species, as well as disruption of food chains, all of which severely impact marine life. The situation is further exacerbated by the persistence of plastics, which require hundreds of years to degrade, thereby intensifying long-term environmental impacts. To mitigate these trends, urgent global action is required, including improved waste management, plastic reduction strategies, and enhanced international cooperation to safeguard marine health and biodiversity (United Nations Environment Programme, 2025a).

Marine plastic pollution is both a scientific issue and a policy challenge (Cui, 2020). During the process of the international community addressing marine plastic pollution, international legal regulations provide an operational framework for state actions (Wang, 2021). The international legal regulation for marine plastic pollution encompasses the following key conventions: the United Nations Convention on the Law of the Sea

(UNCLOS), Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention), International Convention for the Prevention of Pollution from Ships (MARPOL), Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention), Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention), among others. This framework also includes non-binding behavioral norms that nevertheless yield practical effects, such as the series of resolutions on marine plastic pollution adopted by successive sessions of the United Nations Environment Assembly (UNEA). The UNEA has addressed this critical issue through five specific resolutions: 1/6, 2/11, 3/7, 4/6 and 5/14. Resolution 5/14 specifically mandated the Executive Director of the United Nations Environment Programme (UNEP) to convene an Intergovernmental Negotiating Committee (INC) to develop an international legally binding instrument on plastic pollution, including its marine impacts. This instrument adopts a comprehensive lifecycle approach encompassing plastic production, design, and disposal. Following two years of negotiations initiated by UNEA Resolution 5/14, substantial convergence has been achieved in the draft text. The resumed fifth session of the Intergovernmental Negotiating Committee (INC-5.2) is expected to finalize a global agreement to end plastic pollution (United Nations Environment Programme, 2025b). Nevertheless, current international legal regulations continue to face multiple challenges, including inadequate specific control measures, deficient enforcement and compliance mechanisms, and significant regulatory fragmentation, all of which hinder effective prevention and control of marine plastic pollution (Zhang and Jiang, 2024).

As the world's largest developing country, China has dual roles in plastic governance as both a major plastic producer and an active participant in global negotiations. On the one hand, as a leading producer, consumer, and exporter of plastics, China faces the challenge of balancing economic benefits from the plastics industry with environmental protection. On the other hand, as a builder of world peace, contributor to global development, and defender of the international order, China bears indispensable responsibilities in advancing the international legal regulation of marine plastic pollution. Building on this foundation, China actively participates in ongoing global negotiations to end plastic pollution, contributing its distinctive governance solutions. This dual identity as both a developing country and a responsible major power forms the cornerstone of China's approach to addressing marine plastic pollution and engaging in global governance (Li and Kou, 2024).

In 2019, while attending the multinational naval activities commemorating the 70th anniversary of the People's Liberation Army Navy, Chinese President Xi Jinping proposed the vision of a maritime community with a shared future (MCSF). He emphasized that the blue planet we inhabit is not divided by oceans into isolated islands, but rather connected by them into a community with a shared future where all nations share weal and woe. This vision transcends traditional geopolitical thinking by advocating that countries should abandon zero-sum approaches in maritime affairs and pursue win-win cooperation, thereby providing new conceptual leadership for global ocean governance (Chang and Li, 2020). In the context of marine plastic pollution governance, the vision of the MCSF demonstrates particular practical significance. It fundamentally reshapes the cognitive framework of human-ocean relations and interstate maritime interactions, offering both a novel theoretical perspective and a methodological pathway to address current governance dilemmas. Furthermore, it establishes a theoretical foundation for developing a new international plastic governance framework based on principles of environmental justice, shared responsibility, and intergenerational equity.

2 Overview of the international legal regulations of marine plastic pollution

Marine plastic pollution has evolved into a global environmental crisis, affecting ecosystems from coastal waters to the open ocean and polar regions. More alarmingly, plastics progressively fragment into microplastics and nanoplastics through physical, chemical, and biological processes, infiltrating all trophic levels and directly threatening human health. To address this escalating crisis, the international community has established a multilayered regulatory framework. This framework combines binding hard laws with non-binding soft laws (predominantly initiatives and resolutions), forming a complementary governance system.

2.1 International hard law governance of marine plastic pollution

2.1.1 Relevant provisions in UNCLOS

As the foundational legal instrument for international ocean governance, UNCLOS establishes a comprehensive framework covering six types of marine pollution sources through its Part XII on the Protection and Preservation of the Marine Environment. It also provides a critical legal basis for addressing marine plastic pollution. Under Article 194, States Parties are obligated to take all necessary measures to prevent, reduce, and control marine environmental pollution. Articles 207 to 212 specify regulations for these pollution sources from the perspectives of international rules and domestic legislation, while Articles 213 to 222 address enforcement measures, mandating concrete state actions to address marine pollution.

While these provisions collectively provide a systematic legal solution to emerging challenges such as marine plastic pollution, their enforceability remains contested in three key aspects. First, regarding land-based source control. Although approximately 80% of marine plastic pollution originates from land, only a minority of State Parties have enacted domestic legislation regulating land-based plastic waste. Second, concerning dispute resolution mechanisms. There is a lack of compulsory mechanisms for addressing transboundary plastic pollution cases. Third, with

respect to implementation standards. The existing provisions lack minimum criteria, resulting in inconsistent enforcement.

2.1.2 Relevant provisions in the London Convention and its protocol

The London Convention's core objective is to prevent marine pollution and protect biological resources by prohibiting dumping activities. It regulates intentional waste disposal from vessels, aircraft, or offshore structures, excluding operational waste. Adopting a blacklist approach, it explicitly bans persistent plastics, establishing a direct regulatory link to marine plastic pollution.

The 1996 Protocol introduced the reverse-list system, permitting only seven substance categories for dumping (Annex 1)—a stricter regime than the Convention's prohibited materials list. Crucially, plastics were deliberately excluded from the permitted list, demonstrating explicit recognition of marine plastic pollution as a global priority.

Although the London Convention and its Protocol establish a regulatory framework for addressing marine plastic pollution, their jurisdictional scope is confined to the intentional disposal of ship-sourced plastics at sea, while failing to regulate land-based sources of pollution. As a result, their effective regulatory coverage remains limited in scope.

2.1.3 Relevant provisions in MARPOL

MARPOL is a crucial international treaty established by the International Maritime Organization (IMO) to protect the marine environment. Its Annex V (Regulations for the Prevention of Pollution by Garbage from Ships) constitutes the core instrument regulating ship-sourced plastic pollution, imposing an absolute prohibition on discharging any plastic materials at sea without exceptions.

Annex V has undergone significant evolution since its adoption. The 2011 amendment (MEPC Resolution 201(62)) initiated a paradigm shift by replacing the "presumptive permission" principle with presumptive prohibition for garbage discharge. The 2016 amendment (MEPC Resolution 277(70)) marked a breakthrough by: (1) being the first instrument to classify plastics as harmful to the marine environment (HME); (2) listing them as Category A prohibited substances. The 2022 amendment (MEPC Resolution 360(79)) further optimized implementation mechanisms.

While these developments reflect both growing global awareness of marine plastic pollution and the IMO's sustained regulatory commitment, we should soberly recognize that as marine plastic pollution intensifies, the existing provisions of MARPOL demonstrate limited effectiveness in curbing this issue. For instance, Annex V remains an optional instrument that solely addresses ship-sourced pollution, while failing to regulate land-based sources - the primary origin of plastic waste.

2.1.4 Relevant provisions in the Stockholm Convention

The Stockholm Convention, as a core international treaty regulating persistent organic pollutants (POPs), does not directly address marine plastic pollution in its provisions. However, its restrictions on plastic-related chemical substances are closely linked to the governance of marine plastic pollution. The Convention provides an important tool for marine plastic management from the perspective of chemical pollution control, though its focus remains on pollutants rather than plastics themselves.

The Stockholm Convention only covers certain plastic pollutants. Although it can contribute to plastic governance, its scope of application remains relatively limited. In the future, it will be necessary to integrate the Basel Convention and global plastic treaty negotiations to improve joint regulatory mechanisms for plastic additives and microplastics.

2.1.5 Relevant provisions in the Basel Convention

The Basel Convention is the first comprehensive international treaty regulating transboundary movement of hazardous wastes and their environmentally sound management. Its marine plastic pollution provisions were established through the 2019 Plastic Waste Amendments and related resolutions. By controlling plastic waste transfers and implementing a full life-cycle approach, the Convention indirectly mitigates marine plastic pollution.

The amendment categorizes plastic waste into three types under the Convention's Annexes, applying differentiated regulation. To combat marine pollution, they require Parties to: (1) prioritize domestic plastic waste processing; (2) reduce transboundary reliance; (3) minimize ocean leakage risks from poor management. Stricter transfer thresholds prevent plastic waste smuggling into regions with weak oversight. While microplastics are not explicitly listed, restrictions on landfilling/incineration indirectly reduce secondary microplastic emissions.

The supporting resolution Further Actions to Address Plastic Waste mandates: (1) minimizing toxic additives in plastics; (2) implementing classified recycling/safe disposal; (3) technology transfer from developed to developing states.

Although the Basel Convention's synergistic effects with other treaties provide a legal foundation for global marine plastic governance, the Convention and its amendments still exhibit certain limitations in regulating international waste trade and transboundary movements. Issues such as the clarity of its regulatory standards and the effectiveness of enforcement raise questions about the actual extent to which the Basel Convention and its amendments can effectively reduce or prohibit cross-border transfers of plastic waste (Liu, 2020).

2.2 International Soft law governance of marine plastic pollution

Soft law, as a concept counterpart to hard law, denotes rules lacking binding force but generating normative effects via social pressure, market mechanisms, or moral constraints. Characterized by non-binding nature, voluntary compliance, and flexibility, it proves particularly applicable in global governance, emerging technologies, and commercial domains.

In marine plastic pollution governance, international soft law plays a pivotal role. Early instruments include: (1) the 1995 Global

Program me of Action for the Protection of the Marine Environment from Land-based Activities (GPA), pioneering a national-regional-international response mechanism; (2) the 2012 Honolulu Strategy, which introduced microplastics into international governance by linking marine debris to biodiversity impacts; (3) the 2016 CBD COP13 Voluntary Practical Guidelines, explicitly classifying microplastics as a distinct biodiversity threat.

In recent years, growing international concern over marine plastic pollution has led to the emergence of specialized soft law instruments specifically targeting marine plastic pollution (Li and Kou, 2024). The most significant among these are the multiple resolutions on marine plastic pollution adopted by successive sessions of the UNEA.

The first session of the UNEA of the UNEP adopted Resolution 1/6 on Marine Plastic Debris and Microplastics (2014). The resolution: (1) commissioned a global study on marine plastics, synthesizing existing data; (2) urged governments to: enact plastic management legislation; enhance port reception facilities under MARPOL; support beach clean-ups; (3) encouraged private sector innovation in circular economy models (United Nations Environment Assembly, 2014).

The UNEA at its second session adopted Resolution 2/11 on Marine Plastic Litter and Microplastics (2016), which contained several key provisions: it recalled Resolution 1/6 and urged all states to fully implement recommendations through national legislation and regional/international cooperation; emphasized the critical importance of prevention and sound waste management while requiring policies to follow the waste hierarchy principle; stressed the need for capacity-building programs and financial assistance to developing countries, particularly Small Island Developing States (SIDS); and encouraged the development of harmonized definitions for microplastics along with cost-effective monitoring technologies (United Nations Environment Assembly, 2016).

The UNEA at its third session adopted Resolution 3/7 on Marine Litter and Microplastics (2017), which established key provisions including: (1) urging responsible plastic use and reduction of unnecessary consumption while promoting research into sustainable alternatives; and (2) calling for harmonized definitions and monitoring standards for microplastics along with mandating national action plans to prevent marine plastic pollution (United Nations Environment Assembly, 2017).

The UNEA at its fourth session adopted Resolution 4/6 on Marine Plastic Litter and Microplastics (2019), which made two key determinations: (1) acknowledging that microplastics generated throughout product life-cycles enter the food chain and pose potential threats to human health (particularly food safety), thus requiring further scientific examination; and (2) establishing a UNEP-coordinated multi-stakeholder platform designed to enhance governance by coordinating existing mechanisms, implementing comprehensive life-cycle approaches, and ultimately eliminating ocean plastic discharges, with the goal of addressing current policy fragmentation in marine plastic pollution control (United Nations Environment Assembly, 2019).

The UNEA at its fifth session adopted Resolution 5/14 on End plastic pollution: toward an international legally binding instrument (2022), which established three key mandates: (1) formally recognizing existing governmental and international efforts through national/regional action plans, policy initiatives, and legal instruments; (2) emphasizing the imperative for coordinated global action to address plastic pollution; and (3) specifically mandating the UNEP Executive Director to convene an Intergovernmental Negotiating Committee (INC) charged with developing a comprehensive legally-binding treaty encompassing both terrestrial and marine plastic pollution while implementing a full lifecycle management approach (United Nations Environment Assembly, 2022).

While it is an inspiring and ambitious move made by the international community to combat the long-lasting plastic issue at a worldwide level, debates over this topic still exist. Divergent opinions exist regarding fundamental elements of this new instrument, such as the objectives, principles, harmonization with other regimes, the full lifecycle approach, the principle of extended producer responsibility, and the principle of common but differentiated responsibility (Wang, 2023). The first part of the INC's fifth session (INC-5.1) convened at Busan Exhibition and Convention Center, Republic of Korea (25 November - 1 December 2024) to develop a legally-binding instrument addressing plastic pollution, including marine environments. The second part INC-5.2 will convene at Palais des Nations, United Nations Office at Geneva (5–14 August 2025) to finalize the treaty.

2.3 Deficiencies in international legal regulation of marine plastic pollution

2.3.1 Fragmented regulation and insufficient coordination

The rapid transformation in international rules did not occur at the same pace in all of the elemental regimes; nor did the key stakeholders in each regime view the issues identically to their counterparts in other regimes. In some instances the interactions between elemental regimes were supportive. But in many other cases the norms in the different elemental regimes were in conflict (Raustiala and Victor, 2004). In this context, the current marine plastic pollution governance framework is widely recognized as fragmented and uncoordinated (United Nations Environment Programme, 2018). The root cause of fragmentation and lack of coordination lies in conflicts of national interests. When states make decisions based solely on their own interests regarding participation in marine plastic pollution governance, such choices may yield short-term national benefits but prove catastrophic in the long-term global perspective. A lack of trust and communication hinders the formation of international consensus on marine environmental protection.

This fragmentation creates three systemic challenges: First, while UNCLOS establishes general principles for marine environmental protection under Article 194, it lacks specific provisions addressing plastic pollution. Second, critical sectoral conventions remain narrowly focused - the Stockholm Convention regulates POPs without direct plastic controls, the

London Convention governs intentional dumping, but excludes operational discharges, and MARPOL Annex V covers only ship-sourced plastics. Third, substantive overlaps exist between regimes like the Basel Convention's waste trade controls and UNCLOS' state obligations, creating compliance ambiguities for coastal states. Effective governance of marine plastic pollution requires collaboration and coordination among multiple convention mechanisms. However, these regimes differ significantly in their objectives, contracting parties, and priorities, and even exhibit certain degrees of overlap and conflict.

2.3.2 Regulatory gaps in marine plastic pollution governance

The international legal framework for marine plastic pollution governance exhibits three critical regulatory gaps that hinder effective control.

First, a significant science-policy disconnect exists in regulating emerging pollutants like nanoplastics, as evidenced by the IMO's failure to include these particles in its 2022 revision of MARPOL Annex V due to current technological limitations in detecting micrometer-scale plastic particles.

Second, the system lacks comprehensive life-cycle management of plastic additives, necessitating urgent implementation of precautionary measures including (1) establishing a positive list system for permitted additives; (2) creating a dedicated research fund for nanoplastic monitoring; and (3) strengthening transnational scientific advisory mechanisms.

Third, a significant accountability gap persists regarding plastic pollution in Areas Beyond National Jurisdiction (ABNJ), where fundamental questions remain unresolved about responsibility allocation among states and operational mechanisms for enforcement, particularly given the long-term accumulation and transboundary nature of marine plastic pollution (Li and Kou, 2024).

These systemic gaps collectively undermine global efforts to combat the escalating plastic pollution crisis.

2.3.3 Enforcement challenges in marine plastic pollution governance

The international community faces systemic enforcement failures in addressing marine plastic pollution, manifested through three critical deficiencies across key legal instruments. First, the Stockholm Convention, despite two decades of implementation, still lacks an operational compliance mechanism to ensure adherence to its provisions. Second, while MARPOL Annex V comprehensively prohibits all plastic waste discharges (including microplastics) from ships, its enforcement remains severely undermined by inadequate penalty structures and limited port state control capacities, resulting in widespread non-compliance. Third, the Basel Convention's Plastic Waste Amendments exhibit fundamental enforcement gaps, failing to establish essential mechanisms such as: (1) a non-compliance listing system to identify violators; (2) minimum compensation standards for environmental damage; or (3) mandatory jurisdiction for dispute resolution.

3 Theoretical framework and practical significance of the MCSF

The 21st century marks an era of intensified ocean governance, with nations increasingly competing for marine resources through blue economy expansion. In this context, the UNCLOS shows limitations in addressing emerging challenges, necessitating new institutional frameworks guided by innovative concepts (Yao, 2019).

After systematically outlining the limitations of the current global governance system for marine plastic pollution, it is necessary to examine successful precedents in transboundary environmental governance. The successful practices of the International Commission for the Protection of the Rhine (ICPR) in addressing chemical pollution provide critical insights for constructing a new framework for marine plastic governance. The core of its success lies in legally binding quantitative targets; economic incentives based on the polluter-pays principle; unified technical standards and a monitoring network across the entire basin; and effective dispute resolution and emergency response mechanisms. These elements collectively demonstrate that sovereign states with divergent interests can achieve collaborative governance within an effective institutional framework. This provides an important empirical foundation and design rationale for the subsequent construction of the MCSF framework in this study.

Against this backdrop, the vision of the MCSF offers a transformative approach by advocating for cooperative governance models that balance national interests with collective ecological security. Such a complementary governance mechanism is particularly crucial in addressing transboundary challenges like marine plastic pollution, where unilateral actions often prove insufficient against the fluid nature of oceanic ecosystems.

With its growing comprehensive national strength and deepening engagement in global affairs, China is actively undertaking a series of constructive measures to participate in global ocean governance, contributing its solutions and strength (Jin and Cui, 2023). On April 23, 2019, Chinese President Xi Jinping, also Chairman of the Central Military Commission, first proposed the seminal vision of the MCSF during his keynote address to foreign delegation leaders attending the multinational naval activities commemorating the 70th anniversary of the People's Liberation Army Navy in Qingdao. As an integral component of the Community with a Shared Future for Mankind (CSFM), this maritime vision represents China's intellectual contribution and pragmatic approach to safeguarding maritime security and advancing global ocean governance. From the perspective of oceans' inherent interconnectedness, the vision carries profound practical significance in fostering a cooperative, win-win community characterized by peace and stability at sea (Chen, 2019).

This visionary framework not only redefines contemporary ocean governance paradigms but also provides actionable pathways for addressing pressing transboundary marine challenges through its emphasis on shared responsibilities and multilateral cooperation.

Particularly in tackling issues like marine plastic pollution, the vision demonstrates unique advantages in harmonizing national sovereignty with collective ecological security.

3.1 The vision of the MCSF constitutes an integral component of the CSFM

In October 2017, General Secretary Xi Jinping first articulated the vision of building CSFM in his report to the 19th National Congress of the Communist Party of China. In March 2018, the First Session of the 13th National People's Congress adopted a constitutional amendment, enshrining this vision in the preamble of the Constitution. Thus, the vision of building CSFM has been elevated to become China's new guiding philosophy for promoting common development among all nations.

This vision has gained widespread international recognition, including by the United Nations. On February 10, 2017, it was formally incorporated into a resolution of the UN Commission for Social Development on the social dimensions of the New Partnership for Africa's Development. On March 17, it was incorporated into UN Security Council Resolution 2344 concerning Afghanistan. On March 23, it was included in two resolutions of the UN Human Rights Council addressing economic, social, and cultural rights as well as the right to food. On November 2, the vision was further enshrined in two UN General Assembly resolutions on the prevention of an arms race in outer space. In 2018, the vision of building CSFM was adopted in the Qingdao Declaration of the Council of Heads of State of the Shanghai Cooperation Organization, effectively advancing global governance across various fields (Duan and Yu, 2021).

The global endorsement and institutionalization of this vision reflect its growing relevance in addressing contemporary challenges, particularly in the maritime domain, where its principles of shared responsibility and cooperative governance offer a viable framework for resolving complex issues such as marine plastic pollution and biodiversity conservation. As a normative guide for international ocean governance, it bridges the gap between sovereign equality and collective ecological security, demonstrating China's constructive role in shaping a more equitable and sustainable maritime order.

The vision of a CSFM represents a holistic perspective that underscores the interdependence and interconnectedness of all humanity at the global level. It advocates for nations, peoples and regions worldwide to pursue cooperation, development and shared destiny amid economic globalization and cultural diversity. When confronting global challenges - including climate change, environmental pollution and pandemic prevention - the vision emphasizes respecting each nation's sovereignty and unique characteristics while promoting joint responses through equal and mutually beneficial consultation. Ultimately, it aims to build an open, inclusive, clean and beautiful world featuring lasting peace, universal security and common prosperity, thereby enabling better development for all members and sustainable progress for human society (Lin and Shang, 2025).

This visionary framework demonstrates particular relevance in addressing transboundary marine governance challenges. By extending its principles of equitable consultation and shared responsibility to the maritime domain, it provides an innovative normative foundation for reconciling competing claims over marine resources with the imperative of ecosystem conservation. The vision's emphasis on multilateral cooperation and differentiated responsibilities offers a viable pathway beyond the current deadlock in global plastic pollution negotiations.

The CSFM serves as the developmental objective and ultimate direction for the MCSF, while the latter constitutes a concrete manifestation of the former in the maritime domain. The construction of the MCSF requires all nations to participate equally, adhering to the principles of extensive consultation, joint contribution and shared benefits. This entails upholding multilateralism, maintaining openness and inclusiveness, promoting mutually beneficial cooperation, and engaging with maritime affairs in a progressive manner. Only through such approaches can the initiative establish a solid foundation for realization.

Equal participation by all countries in maritime affairs helps address deficiencies in fairness and inclusiveness within the current international system. By ensuring developing nations and small states have their voices heard in ocean governance, this approach injects greater equity into existing maritime governance frameworks. Such practice will generate significant appeal, attracting broader international participation in building the MCSF (Zhu, 2021).

This governance paradigm demonstrates particular efficacy in addressing transboundary marine environmental challenges, where its emphasis on differentiated responsibilities and technology transfer mechanisms provides a viable framework for reconciling ecological protection with developmental needs.

3.2 Concept and attribute of the vision of the MCSF

The CSFM serves as the developmental objective and ultimate direction for the MCSF, while the latter constitutes a concrete manifestation of the former in the maritime domain. Consequently, the two concepts exhibit an evolutionary relationship rooted in the same philosophical lineage. The MCSF is a novel concept for global ocean governance that takes the common marine interests of humanity as its starting point and operates on the principles of cooperative governance, shared responsibilities, and ecological sustainability. Its core essence lies in transcending the perspective of individual national interests, instead regarding the ocean as an ecological community that interconnects the destinies of all humankind. It aims to address global marine challenges that sovereign states cannot tackle alone, such as plastic pollution, biodiversity loss, and the impacts of climate change.

In terms of its attribute, the MCSF represents a values-based and worldview-driven framework for global ocean governance. It

advocates for an ecological ethic of human-ocean harmony, recognizing the marine environment as a living community rather than merely a resource extraction domain. Its practical significance lies not in replacing existing treaties such as the UNCLOS, but in coordinating and integrating the currently fragmented marine governance mechanisms to address regulatory gaps and enhance collaborative enforcement.

Advancing the development of the MCSF contributes to: First, constructing a new model of marine political relations based on mutual trust and mutual understanding. It promotes peaceful dispute resolution through dialogue and consultation, transforming the ocean into a realm of peace, friendship, and cooperation. Second, fostering the just and rational evolution of international maritime rule of law. This includes advancing more binding international agreements on marine plastic pollution and improving new regulations for biodiversity conservation in areas beyond national jurisdiction. Third, promoting sustainable and inclusive development of the blue economy. It facilitates collaboration in marine industries while ensuring equitable sharing of marine economic benefits. Fourth, enhancing marine scientific cooperation and capacity building to bridge technological gaps across nations. Fifth, safeguarding marine ecological health and biodiversity through coordinated responses to ecological challenges such as pollution, acidification, and deoxygenation.

3.3 The vision of the MCSF encompasses profound and multidimensional connotations

The vision of the MCSF represents a concrete manifestation of the CSFM in the maritime domain, encompassing five interconnected dimensions: political, economic, cultural, security, and ecological.

First, politically, it advocates building a sea of equality and mutual trust. As a global governance philosophy emphasizing cooperation and mutual benefit, it facilitates extensive maritime collaboration among nations.

Second, economically, it promotes constructing a sea of win-win cooperation. By enhancing collaboration in marine resource development, maritime industry coordination, technological innovation exchange, infrastructure development, and regional economic integration, it achieves shared economic benefits in maritime affairs, fostering sustainable development and common prosperity of the global blue economy.

Third, culturally, it advances an open and inclusive maritime sphere. Through cultural exchanges, it deepens mutual understanding and trust among peoples, serving as a new engine for the progress of human civilization.

Fourth, in terms of security, it upholds a peaceful and stable maritime order. The vision emphasizes safeguarding maritime security and promoting regional peace and stability.

Fifth, ecologically, it pursues harmonious coexistence with the ocean. Under this framework, nations collaborate to protect marine ecosystems, enhance biodiversity conservation, prevent marine pollution, and jointly address global challenges like climate change and ocean acidification (Chu and Wang, 2024).

This multidimensional framework demonstrates particular relevance in addressing complex marine environmental challenges, where its integrated approach bridges the traditional divide between resource exploitation and ecological conservation.

3.4 The innovative significance of the vision of the MCSF

At present, global ocean governance faces prominent challenges, characterized by insufficient supply of marine public goods, imbalanced distribution structures, irrational utilization patterns, and acute supply-demand contradictions. All nations should assume responsibilities commensurate with their comprehensive national strength in global ocean governance. This represents both a moral principle of international maritime law and a requirement of the equality principle underpinning the MCSF (Wang and Cao, 2023). The pursuit of maritime interests by nations worldwide - whether unilateral or collective in matters such as marine resource allocation and maritime delimitation, ocean resource development and utilization, marine pollution prevention, and maritime dispute resolution - must be grounded in an established institutional and regulatory framework that fosters a value order capable of providing all states with both a sense of justice and security. The vision of the MCSF contributes significantly to the formation of precisely such a value order (Yao, 2019).

The vision of the MCSF embodies the profound principles of extensive consultation, joint contribution and shared benefits. While it inherits and develops the essence of international law principles, including mutual respect for sovereignty, equality and mutual benefit, peaceful development, and pacta sunt servanda. Its profound connotation and objectives transcend traditional principles of international law. With a greater focus on the common development of all humanity and the advocacy of multilateralism, this vision represents both an in-depth development and extension of the fundamental principles of existing international law (Guo and Li, 2021). This vision demonstrates particular relevance in addressing contemporary ocean governance dilemmas, where its emphasis on equitable burden-sharing and institutionalized cooperation offers a normative framework beyond the limitations of conventional state-centric approaches. The ongoing negotiations for a global plastic pollution treaty, incorporating differentiated responsibilities based on historical emissions and technological capabilities, exemplify how these principles can translate into actionable multilateral mechanisms.

4 The vision of the MCSF in marine plastic pollution governance

The MCSF provides a transformative framework for addressing the global challenge of marine plastic pollution. Unlike traditional governance models that emphasize state sovereignty and fragmented regulatory approaches, the MCSF advocates for collective responsibility, equitable burden-sharing, and integrated lifecycle management of plastics. This chapter explores how the principles of the MCSF can enhance international legal regulation, bridge existing governance gaps, and foster cooperative solutions to marine plastic pollution.

4.1 The vision of the MCSF aligns closely with the governance of marine plastic pollution

The vision of the MCSF embodies profound and multidimensional implications. This vision transcends the unidimensional approach of traditional ocean governance, establishing a systematic value framework across five key domains: political, economic, cultural, security, and ecological (Chu and Wang, 2024). Its profundity manifests in three dimensions: (1) Firstly, it redefines the ethical relationship between humanity and the ocean, transforming the marine environment from a target of resource extraction to a member of the life community; (2) secondly, it innovates the jurisprudential foundation of international maritime law by upholding the principle of state sovereignty while emphasizing intergenerational equity and the common heritage of mankind; (3) finally, its practical dimension creates flexible governance space for nations at different development stages through a differentiated responsibility mechanism (Guo and Li, 2021). This multidimensional nature enables the MCSF to guide macro-level institutional design while implementing concrete pollution governance solutions, achieving a dialectical unity between theory and practice.

First, in the political dimension, the MCSF advocates for extensive cooperation among nations in maritime affairs. The governance of marine plastic pollution constitutes a comprehensive system spanning multiple domains, sectors, and levels. Effective governance necessitates balancing and coordinating diverse interest groups to achieve win-win outcomes. In this context, the MCSF redefines humanity 's relationship with the ocean through its core principle of mutual benefit and collective prosperity. Unlike state-centric approaches dominated by nationalist interests, the MCSF framework envisions the ocean as an interconnected and indivisible community with a shared destiny (Wang and Chu, 2024).

Second, in the economic dimension, the MCSF prioritizes fostering cooperation across multiple domains, including marine resource development, maritime industry coordination, technological innovation exchange, infrastructure construction, and regional economic integration. The effective implementation of any regulatory framework requires robust financial mechanisms, and global marine plastic pollution governance is no exception. Establishing diversified financing instruments through legal channels is essential to ensure adequate funding for these efforts. The MCSF advocates for pluralistic investment engagement, enabling states to stimulate private-sector participation through low-interest financing vehicles, thereby cultivating a government-anchored, enterprise-driven investment paradigm. Furthermore, the MCSF emphasizes institutionalized multi-stakeholder coordination. By promoting interagency collaboration among international bodies, corresponding governance measures can be implemented to operationalize the Global Marine Plastic Pollution Governance Fund. Targeted financing incentives - including capacity-building grants for nations facing compliance limitations - can address free-rider problems while enhancing collective implementation effectiveness (Zheng, 2022).

Third, in the cultural dimension, the MCSF is committed to enhancing mutual understanding and trust among peoples of all nations, injecting new momentum into the advancement of human civilization. In advancing the governance of global marine plastic pollution, institutional reform must be catalyzed through maritime cultural exchanges (Wang and Wang, 2022). The framework establishes a science-driven dialogue model with government endorsement, civil society leadership, and multi-stakeholder engagement, while building a multidimensional, in-depth, and integrated maritime cultural dialogue mechanism. By reconstructing the emotional bonds and value perceptions between humanity and the ocean, it lays the socio-psychological foundation for technical governance measures, ultimately achieving a complementary governance mechanism from reactive regulation to proactive prevention.

Fourth, in the security dimension, the MCSF upholds a peaceful and stable maritime order. Maritime security encompasses both traditional and non-traditional security issues. The former relates to geopolitical competition and sovereignty disputes over islands and reefs, while the latter involves maritime terrorism, piracy, marine environmental pollution, and oceanic disasters (Li, 2024). Global marine plastic pollution represents a quintessential non-traditional security issue that poses severe threats to marine ecosystem health. The MCSF initiative calls upon nations to enhance cooperation in establishing comprehensive monitoring and recycling systems for plastic waste. Furthermore, the MCSF actively supports the UNEP in advancing negotiations for a global plastic pollution treaty, aiming to create an international governance mechanism that covers the entire lifecycle of plastics.

Fifth, in the ecological dimension, the MCSF promotes harmonious coexistence with the ocean. Due to the interconnected nature of marine ecosystems and the transnational scope of maritime activities, no single country can independently protect the marine ecological environment. Strengthening governance of marine plastic pollution requires a combined approach of prevention and remediation, as well as the establishment of a widely-participated international convention on marine conservation (Wu, 2021). The vision of the MCSF can

provide an approach to global marine plastic pollution governance, working hand in hand with all nations to build a fair, equitable and mutually beneficial global governance system for marine plastic pollution.

4.2 The vision of the MCSF's position in the governance of marine plastic pollution

The MCSF represents a values-based and worldview-driven framework for global ocean governance. Its practical significance lies not in replacing existing treaties such as the UNCLOS, but in coordinating and integrating the currently fragmented marine governance mechanisms to address regulatory gaps and enhance collaborative enforcement.

The MCSF designed to overcome the fragmentation and enforcement deficits that plague existing marine governance regimes. It is designed to create operational linkages between foundational treaties. For instance, it tries to establish harmonized plastic waste classification standards and data reporting formats to resolve jurisdictional conflicts between MARPOL Annex V (which regulates ship-sourced plastics) and the Basel Convention (which governs transboundary waste movements). By doing so, the MCSF enhances interoperability among sectoral agreements without undermining their legal authority.

The MCSF demonstrates distinct differences from traditional regimes. Firstly, regarding regulatory scope, traditional mechanisms are characterized by sectoralization and fragmentation, whereas the MCSF adopts a full lifecycle governance model that covers all stages from plastic production and consumption to disposal. Secondly, in terms of enforcement mechanisms, traditional approaches rely on national self-reporting supplemented by diplomatic pressure, often resulting in insufficient effectiveness. In contrast, the MCSF emphasizes automated monitoring and penalties for non-compliance, significantly enhancing enforcement efficiency and reliability. Thirdly, in the dimension of technology transfer, existing frameworks are largely based on voluntary principles lacking binding force. Conversely, the MCSF advocates for establishing mandatory technology transfer quotas, turning knowledge sharing into a legally binding obligation. Fourthly, concerning stakeholder inclusivity, traditional governance models are state-centric, with sovereign states as the primary actors. The MCSF, however, aims to build a multilateral governance system that organically integrates various entities including states, enterprises, and non-governmental organizations (NGOs), thereby achieving broader democratic participation. Lastly, regarding conflict resolution mechanisms, traditional methods depend on *ad hoc* diplomatic consultations or time-consuming international litigation. The MCSF proposes harmonizing treaty standards through coordination to prevent and resolve conflicts at their root via technical solutions. The MCSF does not represent minor adjustments to the existing system but offers a novel governance approach characterized by greater integration, binding force, and operational practicality for addressing global marine plastic pollution. Building upon this foundation, the MCSF and the proposed global plastics treaty are designed to have a symbiotic relationship, rather than a competitive one.

4.3 The vision of the MCSF's unified framework in the governance of marine plastic pollution

The framework of the MCSF encompasses multiple elementssesp,galted but not limited to, the principle of common but differentiated responsibilities, technology transfer, balancing environmental objectives with economic development needs, and coordinated monitoring and enforcement. These elements do not exist in isolation as singular entities, but rather form a continuous, mutually reinforcing process. This can be understood as a cyclical chain: technology transfer based on responsibility assessments, financing the required actions, and conditioning support upon compliance verification. These components are interlocked in an interconnected relationship.

The first step, from responsibility to action. In terms of the principle of common but differentiated responsibilities, it is a mechanism that addresses the asymmetrical distribution of obligations in the face of a global threat. It encapsulates the shared aspiration of mobilizing as much of the international community as possible (Wang, 2025). The vision of the MCSF advocates for a modernized application of the principle of common but differentiated responsibilities. It takes into account multiple factors, including national plastic consumption levels, waste management capacities, and the extent of marine environmental impact. The vision proposes establishing a responsibility index assessment system to set differentiated emission reduction targets and technology transfer obligations for various countries. This approach both acknowledges historical responsibilities and focuses on current capacities. As for technology transfer, the vision of the MCSF emphasizes an innovation ecosystem based on win-win cooperation. It proposes exporting marine plastic pollution monitoring and governance technologies to developing countries, particularly key technologies such as remote sensing monitoring and biodegradable material alternatives. The framework recommends establishing enhanced technical cooperation mechanisms through multiple pathways, including joint research and development, patent sharing, and capacity building. Additionally, it advocates creating technology transfer incentive mechanisms, such as tax benefits or policy support for enterprises that transfer environmental technologies to least developed countries. Furthermore, it calls for incorporating dedicated technology transfer clauses in international negotiations and establishing monitoring mechanisms to ensure implementation.

The second step, from action to support. As for support, the vision of the MCSF advocates a multi-stakeholder synergistic funding model. It proposes establishing a hybrid mechanism integrating public funds, private sector investments, and ecological compensationolde instance, by creating a Global Marine Plastic Governance Fund. To address deep-sea plastic pollution, a seabed ecological compensation mechanism could be

established, with the raised funds specifically allocated to deep-sea plastic cleanup and ecosystem restoration projects.

The last step, from support to verification. It relates to the coordinated monitoring and enforcement. the vision of the MCSF advocates an incentive-driven approach supplemented by regulatory measures. It proposes integrating market-based incentives such as plastic credit trading and green supply chain certification. Concurrently, a tiered oversight system could be establishedy,.enred, tax reductions and policy incentives to nations and enterprises exceeding emission reduction targets, while implementing graduated penalties for non-compliant entities. Furthermore, the creation of an independent verification mechanism is recommended to conduct periodic audits of national plastic reduction progress, ensuring transparency and accountability in policy implementation.

4.4 The vision of the MCSF's solutions to deficiencies in the governance of marine plastic pollution

The current international legal framework for marine plastic pollution suffers from significant deficiencies, characterized by fragmented and poorly coordinated regulations, substantial regulatory gaps in addressing emerging pollutants, and systemic enforcement challenges due to weak compliance mechanisms and inadequate monitoring capacities. The MCSF provides guiding principles for addressing the aforementioned deficiencies.

To address fragmented and uncoordinated marine plastic pollution governance, states should recognize that active participation aligns with their national interests. Establishing trust and cooperation in this field requires a new vision that serves the collective interests of the global marine environment. The vision of MCSF emerges as a viable solution. Rooted in humanity's shared marine environmental interests, the promotion of MCSF facilitates a phased transition in governance philosophy from a sovereign-state-centric approach to one prioritizing common human interests. The MCSF attaches great importance to balancing the interests of developed and developing countries. For developed countries, the MCSF enhances regulatory predictability and cross-border pollution control through harmonized standards, effectively addressing their core concerns regarding transboundary plastic leakage. For developing countries, it guarantees technology transfer provisions and graduated compliance timelines aligned with the principle of common but differentiated responsibilities. This dual approach transforms the North-South divide from a barrier to cooperation into a catalyst for innovative governancenities developed countries gain efficient enforcement mechanisms while developing countries secure the capacity-building support essential for meaningful participation. The MCSF thus transcends zero-sum logic by demonstrating, through institutional designs that proportionally assign rights and responsibilities according to national circumstances, how competing interests can be reconciled.

The MCSF addresses regulatory gaps for emerging pollutants through a dynamic listing mechanism. This system mandates periodic review of novel plastic additives and non-regulated polymer types, automatically triggering monitoring requirements for substances with demonstrated marine toxicity.

Confronting the challenge of inadequate enforcement in global marine plastic governance, the MCSF proposes two solutions. Establishing a mandatory arbitration system through a specialized Plastic Dispute Tribunal composed of jurists with dual expertise in maritime law and environmental science. Creating a novel Plastic Pollution Liability Fund financed by extended producer responsibility levies and non-compliance penalties. The MCSF institutionalizes the principle of common but differentiated responsibilities by exempting least developed countries from financial penalties, while ensuring differentiated but meaningful consequences for all violators.

5 Conclusion

As the United Nations intergovernmental negotiations on ending plastic pollution enter a critical phase, establishing a legally binding global agreement on plastics has become an international consensus. As of July 2025, the INC has conducted five rounds of talks, including a pivotal session held in Busan from November to December 2024. The discussions focus on three core contentious issues: the list of hazardous chemicals, sustainable plastic production, and financing mechanisms. The MCSF framework provides constructive guidance for resolving these disputes.

The ongoing negotiations for a global plastic pollution agreement serve as a crucial test case for the practical application of the MCSF vision. Against this backdrop, an in-depth exploration of how the vision of the MCSF can concretely guide the construction of international agreements holds significant theoretical and practical value. Grounded in its systematic approach, the future agreement could establish four core principles:

1. The Principle of Ecosystem Integritys:alntalentr marine plastic governance with terrestrial management, climate change mitigation, and biodiversity conservation. This principle requires the agreement to address not only marine plastic pollution but also land-based pathways such as riverine inputs and atmospheric deposition, achieving full lifecycle management.
2. Modernized Application of the Common but Differentiated Responsibilities Principleilitie recognizing shared responsibilities among nations, this principle calls for a differentiated burden-sharing system based on indicators such as plastic consumption levels, waste management capacity, and marine ecosystem vulnerability.
3. The Principle of Scientific Innovation and Just Transitionity.eslentri technological progress with industrial upgrading to ensure that developing countries

are not marginalized in the transition to sustainable plastics management.

4. The Principle of Multi-Stakeholder Collaborative Governanceivelderentricn the complementary roles of states, international organizations, businesses, civil society, and the public in plastic governance, and establishing a multi-tiered cooperation network.

The vision of the MCSF offers innovative value for restructuring the global governance system for marine plastic pollution. First, it expands governance actors. The vision advocates moving beyond sovereign states as the sole participants, instead establishing a multi-stakeholder system encompassing international organizations, NGOs, businesses, research institutions, and the general public. Second, it extends the governance scope. While traditional approaches focus mainly on end-of-pipe plastic waste management, the MCSF promotes a full lifecycle transformation covering production, design, consumption, recycling and disposal. Third, it innovates governance methods. The MCSF emphasizes a hybrid approach that combines hard-law instruments like treaties with soft-law tools such as initiatives and standards. This flexible yet pragmatic approach is particularly suited to complex issues like plastic pollution, maintaining policy adaptability while progressively strengthening binding force. Fourth, it elevates governance objectives. The MCSF integrates plastic governance with sustainable development and climate change agendas, pursuing systemic solutions that address interconnected challenges.

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