Marine Pollution and International Environmental Law: Evaluating State Responsibility under Global Ocean Governance

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Abstract

This paper takes a look at the different layers of the responsibility of states in relation to marine environmental degradation, focusing on the interpretative components of the United Nations Convention on the Law of the Sea. This research, moreover, examines the impact of international environmental values on the process of applying liability regimes for controlling transboundary pollution by both government and private bodies. The analysis also underscores the need for moving beyond reactive approaches to proactive due diligence in tackling the jurisdictional complexities of offshore resources exploitation. Furthermore, the 2024 ITLOS advisory opinion reinforces the need to incorporate these elements of preventative law, including minimizing impact and material loss, to harmonize the gaps between the emerging legal rules and contemporary environmental agreements. In this context the important role of Port State jurisdiction and customary obligations would be relevant to add another arm to accountability. The cumulative and growing character of these obligations gives the international community a vested interest in maintaining marine integrity by allowing for the raising of the issue of shared responsibility.

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Introduction

The increasing amount of marine debris and trans-boundary pollutants requires a detailed review of the policies and laws and their enforcement through the state obligations. Key regulatory mechanism is the United Nations Convention on the Law of the Sea, however, its framework provisions have a limited ability to deal with the systemic complexities of land-based and cumulative sources of pollution. Existing instruments (such as MARPOL and the Basel Convention) thus tend to suffer from the fragmented nature of each, and struggle to account for the transboundary and diffuse nature of plastic waste and for attribution in relation to this. This restriction underscores the importance of thinking of marine environment protection duties as an “erga omnes” obligation, giving states the ability to invoke shared responsibility even in cases where the injury may not be readily established. International law can improve its response to problems of shared state responsibility for land-based pollutants by intensifying the burden of due diligence, while facilitating 'interlinkages' between fragmented environmental regimes. Moreover, this life-cycle approach could bring a comprehensive legal framework to overcome these fragmented governance regimes, maximizing efforts to reduce ecosystem degradation. This should be clearly understood and included in such a mechanism that the "vacuum" of responsibility as a result of the "diffused" nature of pollution is not allowing for the application of a "causation" requirement as is typically set forth in tort law and is often unworkable in international contexts. Therefore, there is a need for a paradigm shift in legal doctrine in order to shift the focus to the "no harm" rule, which holds that no States can be allowed to impose activities under their control that entail an adverse transboundary environmental impact. Furthermore, by incorporating the concept of “common but differentiated responsibilities”, a potential mechanism for recommodity national responsibilities, based on different capacities and past contributions to marine degradation, is introduced.

This paper is carried out in six parts. Part II examines the sources from which and the content of international law on marine pollution. Part III explores the state responsibility for ocean harm. Key judicial and arbitral cases are analysed in Part IV. Part V examines the architecture of governance of all global oceans, including the recently agreed land-mark Agreement under UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement). Part VI suggests to reinforce accountability using a 'due diligence' approach, while Part VII concludes.

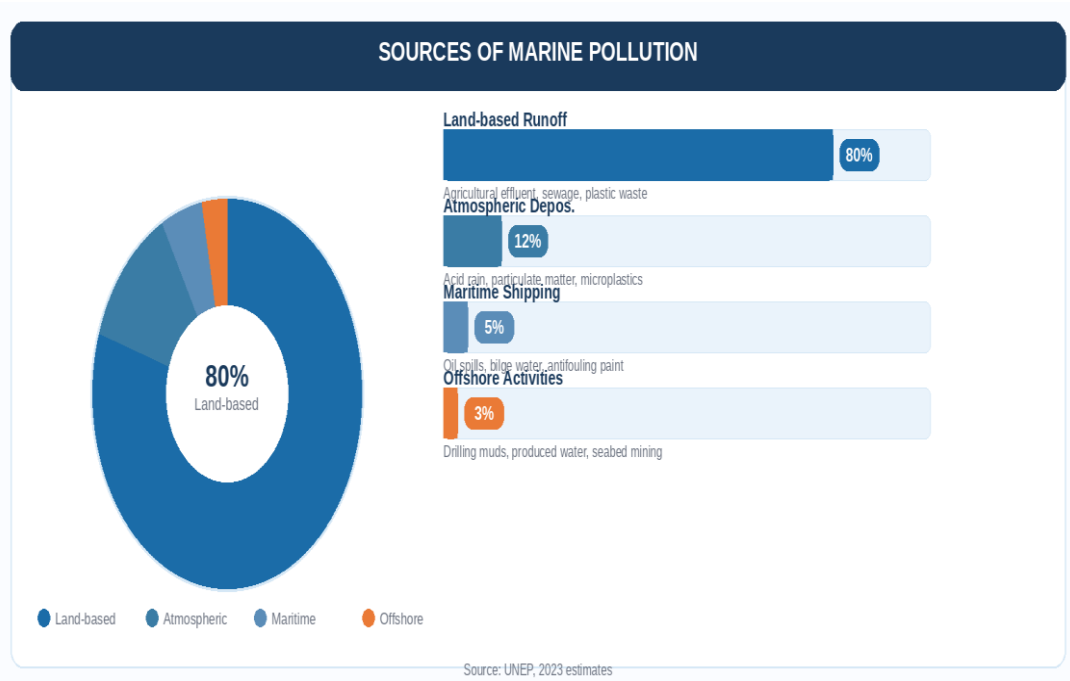

Figure 1. Distribution of marine pollution sources by origin (UNEP, 2023 estimates). Land-based runoff, agricultural effluent, and coastal municipal waste collectively constitute the dominant pollution vector.

The international legal framework for marine pollution

The united nations convention on the law of the sea

But UNCLOS requires States to take measures to prevent and minimise pollution from any source, without giving it specific and enforceable obligations to address plastic waste from land-based sources, the bulk of global marine pollution. This regulatory gap continues due to the convention's reliance on sovereign territorial management with only a weak binding international oversight in respect to land based sources. To fill this jurisdictional divide, responsibility must be rooted in the obligation that is part and parcel of sovereignty as control and accountability. So the existing governance persists as priorities linger in the "soft laws" while effective mechanisms of enforcement in "hard laws" for microplastic control are still not in place.

Customary International Law and General Principles

But this standard also calls on States to maintain constant care in taking action against pollutant discharges, whether to cause damage in territorial waters or in high seas. Moreover, environmental "principles" can, even if not necessarily legally binding, serve as an important lens through which accountability can be attributed for multi-source pollutants such as marine litter. Conversely, the growing recognition of the ‘polluter-pays' principle in various multilateral agreements, like the BBNJ Treaty of 2023, points to a newfound sense of responsibility of economic actors and states on negative externalities facilitated through the material aspect of their footprint. In addition, ongoing negotiations on a global plastic treaty indicate that the common but differentiated responsibility (CBDR) principle is increasingly being discussed as a useful basis for equitable mitigation burden sharing. These debates further highlight the shift from soft law, decentralised and fragmented, to a binding and centralised regime that is able to tackle plastic pollution across the plastic cycle. Such a shift is still necessary for the reasons that the current traditions of categorisation of marine litter based on mass in international conventions do not account for the different toxicological impacts that land-based marine pollutants have.

Sectoral Treaty Instruments

There are several relevant regulatory nodes in place, including the Basel Convention, which regulates the commencement of movement, and MARPOL, which regulates the use of plastics once they are in use, but with fragmented coverage, it is essential that all steps in the plastic pollutants' life cycle are conveyed through the regulatory process. In the absence of any specific, legally binding treaty, existing initiatives often focus on voluntary measures, leaving a gap for smarter and more stringent enforcement efforts to be taken to tackle the issue of transboundary migration of microplastic. In particular, regulatory 'silo mentality' impedes implementation of the plastic prohibition, even with sectoral instruments such as MARPOL Annex V requiring ships to make adequate port reception facilities available for ship-sourced waste.

State responsibility for marine pollution

The ILC Articles on State Responsibility

The application of the articles in practice offers a template for determining when internationally wrongful acts are committed by state, but often has problems in determining whether the environmental harm is caused by nonpoint source pollution or by adding up multiple industrial activities. Specifically, the need to show a direct causal connection between a single measure taken by the State and widely-spread and transboundary degradation does not fully reflect the cumulative and systemic character of plastic pollution. In response, researchers suggest changing the concept of state responsibility, requiring a "standard of due diligence" for the lifecycle of plastics, including their land-based origins, and consequences on the ocean. This transition requires that states take more than a passive role in enacting home legislation and need to involve themselves in monitoring and cooperation on a multilateral basis to help overcome the more diffuse hurdles to effective management.

Attribution and the Due Diligence Standard

For the purposes of this standard, the actions of a state that fails to regulate emissions from land-based sources could be considered an internationally wrongful act if it exhibits a lack of "due diligence" in preventing emissions with known and foreseeable risks. This requires a shift from soft law measures to a legally binding, proactive and comprehensive framework with a particular focus on the 80% of marine litter that comes from land-based activities. This shift in case law is needed to address the very limited nature of Articles 207 and 213 of UNCLOS, which now encompass a range of categories of pollutants, many that don't help make polluters accountable. As an alternative, the responsibilities under the London dumping regime and

MARPOL are more specific with regards to maritime discharges, but haven't been matched by the common responsibility for terrestrial leakage before, between or after discharge.

Causation, Harm, and the Problem of Diffuse Pollution

The spread of plastic pollution typically results from several jurisdictions, and as a result, it is hard to hold a specific jurisdiction responsible for the ecological harm caused by widespread plastic pollution. To address this complexity, there is growing emphasis in the legal world that "due diligence" is a dynamic concept that needs to constantly develop along with the progress of scientific knowledge about the environment's hazards. However, the content of due diligence should evolve as standards of care evolve with the technological capacity to carry them out and the nature of the dangers from watercourse pollution, and should include the complex management of shared international watercourses.

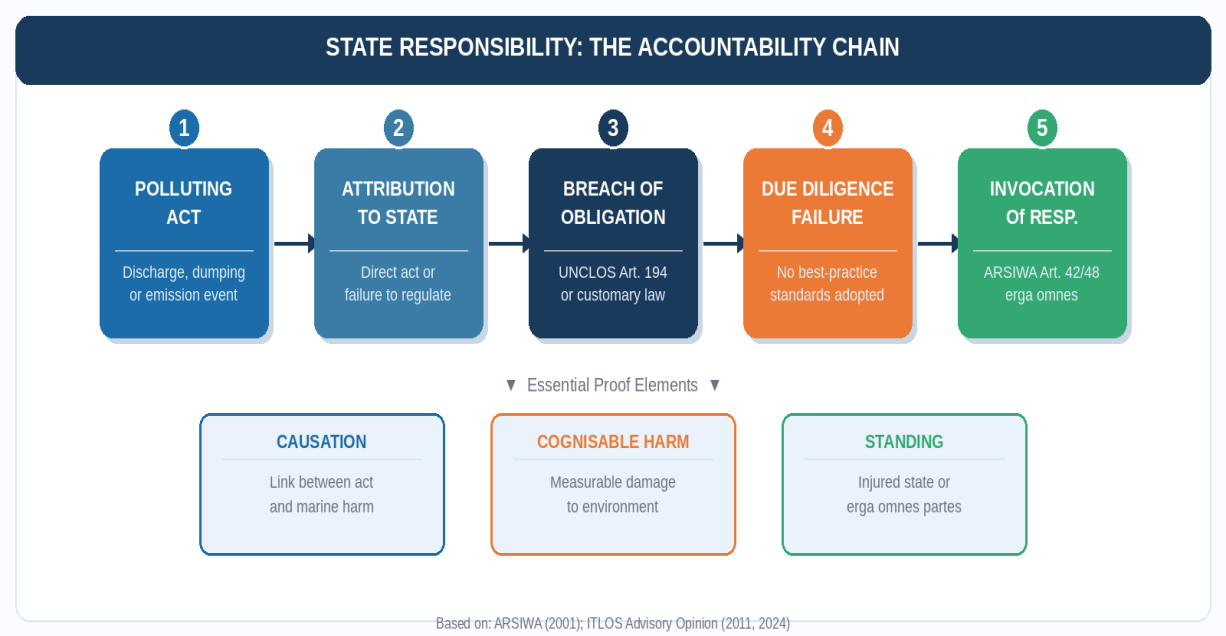

Figure 2. The three-element accountability chain for marine pollution under ARSIWA, highlighting the centrality of due diligence standards in contemporary jurisprudence.

Judicial And Arbitral Practice

The Mox Plant Case And Procedural Multiplicity

During the case, it was pointed out that concurrent jurisdiction by multiple international fora and the split in the interpretation of "due regard" and precautionary measures in marine pollution conflicts were two inherent difficulties. More generally, the procedural overlaps highlighted how, in assessing compliance with a state's obligation to prevent transboundary environmental damage, all factors create significant challenges to the tribunal's ability to balance competing obligations. This judicial multifacetedness highlights the pressing need to create a legal nexus which would allow to better integrate the normative contents of the different treaties under consideration with the general principles of customary international environmental law. All this is another example of the inadequacy of the prevailing frameworks in dealing with the cumulative effects of plastic waste, and the difficulty of enforcing state responsibility for land-based leakage in a world without an effective global instrument. Moreover, the fragmented and uneven geographical distribution of legislations indicates that a more profound merging of watercourse and marine governance might be able to give the necessary structure to resolve such gaps in jurisdiction. This might be achieved by adopting a ‘Source-to-Sea' (S2S) approach to plastic waste management, which could link up inland waste management with marine protection goals, and reduce leakage of pollutants across the various types of jurisdictions.

The Pulp Mills Case and Environmental Impact Assessment

“In this context emphasizes that the potential for an EIA constitutes a key pillar of good faith in avoiding primarily serious damage to the environment on the other side.” The International Court of Justice has confirmed that the requirement is extended beyond the specific context of any treaty, and has become a key

obligation in any activity that may cause injury to shared water resources or the marine environment. The IJLOS has recently affirmed and deepened these obligations to explicitly account for degradation due to climate factors and pollutants, encouraging due diligence to become more centrally integrated in international maritime law. The advisory opinions of the ITLOS are indicative of the shift created by the ICJ precedent that the duty to conduct an assessment is an interpretative means to give effect to the substantive obligations and is effectively tantamount to a "conditio sine qua non" existence requirement for lawful by the State.

ITLOS Request for Advisory Opinion on Climate Change (2024*)*

The notice of the Tribunal's role as an advisory body underlines the dynamic role of due diligence as a tool to address systemic environmental risks and that obligations under UNCLOS are to be interpreted in the context of the precautionary principle to prevent irreversible transboundary harm. The growing judge's jurisprudence highlights a state's duty of heightened scrutiny or oversight over private entities, whether due to climate change or because of discharge of harmful substances, to prevent significant harm. In addition, this interpretive development is consistent with the new law that interprets the need for EIAs as not limited to situations involving transboundary effects but also situations involving risks to the global commons. This broad view of the procedural obligations reinforces the “functional link” between the procedural responsibilities to carry out assessments and the substantive obligations to prevent Environmental degradation.

The architecture of global ocean governance institutional fragmentation and coordination gaps

The challenge today is that there are too many mandates in place, they are siloed and often these mandates for shipping are not integrated with wider terrestrial pollution control policies. This institutional disconnection requires a different approach in the form of a more holistic framework which connects the climate-focused, soft commitments of the Paris Agreement with stronger maritime commitments in the form of obligations under UNCLOS. An effective way for States to apply the international climate regime's external standards to justify what, how and why underpin their duty to exercise due diligence under Articles 192 and 194 of the Convention is through the principle of systemic integration. In particular, the designation of GHGs as pollutants subject to UNCLOS requires States to take adequate means and to do the best possible to prevent, reduce and control the emissions from any source they have jurisdiction over. Furthermore, synergies between the two sectors climate and ocean regimes must be mobilised in order to tackle the lack of specific target setting in the 1982 Convention, which has no specific mandate on ocean stressors of climate change.

The BBNJ Agreement and High Seas Governance

This treaty is an important step for ocean governance around the world, as it establishes a framework for the management of biodiversity beyond national jurisdiction and aims to break the historic deadlock in the management of the high seas. The agreement gives legal force to the creation of marine protected areas, and makes sure that projects like international shipping which have lacked adequate environmental evaluation and oversight in the past are properly regulated. Moreover, this instrument provides an important means of achieving a balance between high seas governance and the development of international law, the absence of an adequate regulatory framework to tackle transboundary environmental effects may nonetheless leave a gap that is not filled. Further, by explicitly establishing a requirement to consider cumulative effects including ocean acidification and ecosystem alteration through climate change, BBNJ Agreement sets an important precedent to protect the carbon-cycling services critical to global climate regulation. However, to be effectively implemented, the provisions must be negotiated and faced with potential problems of normative overlap or conflict with this new instrument and the existing legal order of the sea.

Regional Seas Programmes

They are a necessary mechanism by which commitments made under global environmental agreements can be put into practice at Sub-Rregional level; through them, global environmental commitments are translated into the ecological needs of unique maritime basins. Nevertheless, effectiveness of these schemes is currently restricted by the limited spatial scope of regional governance (because many have little or no power to extend their enforcement into EEZs, for example), and they are often unable to tackle stressors that cross over interwoven maritime jurisdictions. The BBNJ Agreement could help to address this systemic deficiency through coordinating existing international processes and promoting a polycentric management order that addresses these gaps in jurisdiction. Within this context, the BBNJ Agreement provides strong capacity

building and technology transfer provisions which are key for the support of developing States with regard to the regional monitoring and management. The Agreement admits a hybrid governance structure which allows regional institutions to sub-delegate to the global if appropriate, but provides the flexibility to adaptively manage.

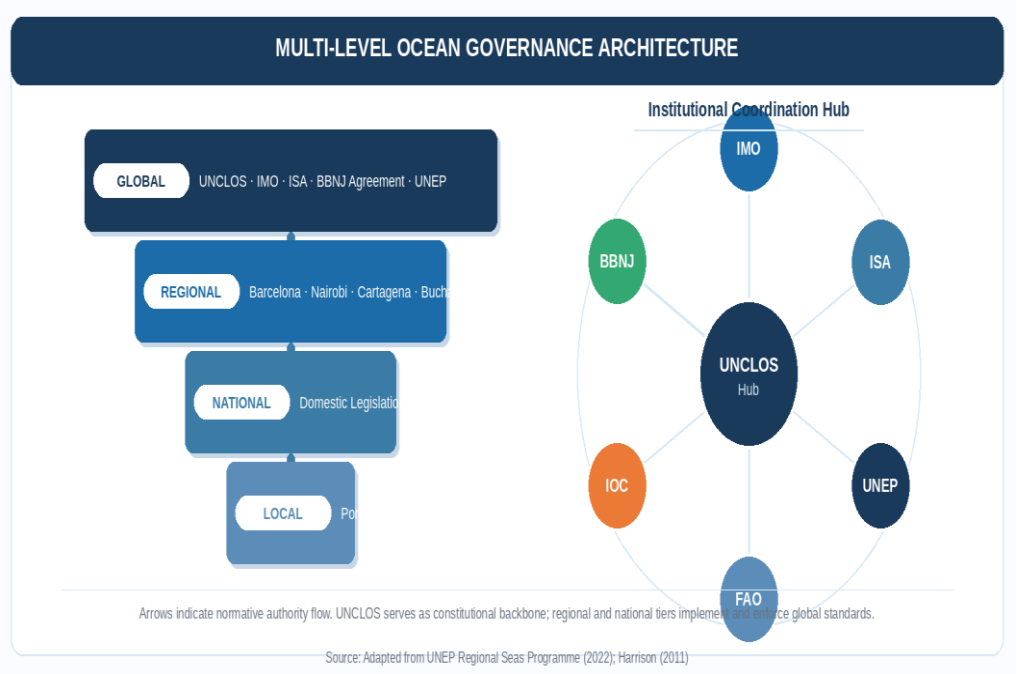

Figure 3. The nested, multi-level architecture of global ocean governance. Effective state responsibility requires coherence across all three tiers, yet coordination gaps remain a persistent structural deficiency.

Towards an integrated due diligence model

Reconceptualising state responsibility

The existing legal system needs to shift from the reactive notion of liability towards a proactive enforcement regime, based upon the erga omnes dimension of conserving the environment. This change will require some clear regimes of responsibility with specific relief mechanisms and held to account for the implementation of environmental impact assessment, and also held accountable for the timely rehabilitation of damaged marine ecosystems. In addition to remediation, as part of this model, cross-sectoral coordination is needed to incorporate the ocean carbon dimension in strategic environmental assessments to avoid habitat degradation that could compromise long-term sequestration integrity. Moreover, the inclusion of these requirements as part of regional seas conventions would give the much needed platform on which to monitor transboundary carbon stocks and control anthropogenic stressors affecting their resilience. Moreover, the establishment of common due diligence standards, alongside regular assessments of the impacts of financial institutions and openness regarding those effects, is crucial for financial institutions and maritime sectors to align their activities with the goal of global sustainability.

The Role of Non-State Actors and Private Liability

Marine carbon dioxide removal (mCDR) is connecting commercial activities more and more with their international obligations to biodiversity and climate mitigation, and non-state entities need incentives to reflect these in their activities. To this end, multi-stakeholder partnerships between States, research institutions and commercial entities can help to assure that these emerging technologies meet the BBNJ Agreement's need to observe the precautionary principle as well as other climate mitigation obligations. Reporting indicators and protocol for geolocalization should be a priority for such collaborative governance models to maintain transparency and verifiability of private sector accountability. Furthermore, international law can and should create direct obligations for the corporations; international law already provides for direct obligations of private companies for environmental harm under UNCLOS and international humanitarian law. If such a regime is to be implemented, it's important to define the difference between small scale research projects and large scale commercial deployments, so as to avoid the circumvention of environmental protection standards.

Dispute Resolution and Enforcement Gaps

It is challenging to resolve transboundary disputes related to marine CCS, due to the fragmentation of international law, which features independent and sometimes competing systems of regulation. The scientific, technological, and legal systems interact with each other but can also function as distinct, self-referencing, and self-generating systems, resulting in divergent interpretations of responsibility for subsurface storage site integrity. Existing dispute resolution structures should be strengthened and procedures need to be more universally adopted, to ensure that new technologies cannot outpace the law's aim of regulating new technology risks. In particular, the challenges of aligning the procedural obligations under the environmental assessment provisions of the London Convention and London Protocol (LC/LP) with the BBNJ Agreement must be overcome to clear up ambiguiities regarding EIAs of ocean-based negative emissions technologies. This regulatory consistency is key, with current governance structures frequently lacking in terms of being able to respond to the specific aspects of ocean geoengineering an approach that in the current geopolitic context is generally discouraged or poorly defined in treaties such as the CBD. Secondly, existing international conventions are not yet legally binding nor have the scope to fully control the ecological risks that involve large-scale marine geoengineering, which is a critical oversight that requires immediate legislative unification. An international tribunal (or a special-purpose commission) might give the necessary legal security to dispute ecological damage resulting from these new interventions, which are trans-boundary in nature.

Conclusion

As the number of proposed marine CDR technologies is increasing, the obvious point is that there is a fundamental tension here between the urgency to enact climate mitigation and the absence of a robust governance framework to guarantee safe and responsible deployment. Filling this institutional gap would need a systematic incorporation of ocean governance regimes, to take account of different mandates of the Law of the Sea and the evolving climate change obligations. This move toward a unified approach to regulation needs to focus on "remedies," which would start by meeting fragmented governance frameworks that do not adequately consider the complex interdependencies between social, ecological, and technological domain. Furthermore, there is a critical need to integrate well-informed and evidence-based approaches in the classification and ranking of the effect of IMREs in the future policy frameworks in terms of climate mitigation and local ecological adaptation. Finally, effective governance of these interventions requires effective implementation of the core principles of responsibility ‘responsible transformation’ must remain at the core of international ocean policy. A "coast out" governance approach, focusing the needs and socio-economic aspirations of local communities, is crucial to the successful implementation of these technological solutions without adding to current climate risks. Building on this, future legal developments should respond to differences in degrees of technological readiness, and in the types of potential secondary environmental impacts that might flow from different approaches to carbon dioxide removal for instance, localized ocean restoration, which would not impact the deep ocean, vs the more dramatic and high-impact interventions, which would affect the deep ocean.

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