

## Environmental Impact Assessment in High Seas: Critical Analysis Under BBNJ Treaty

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### ABSTRACT

The high seas, which include regions beyond national jurisdiction, face a new level of ecological challenges with loss of biodiversity, plastic pollution, and climate-induced ocean acidification. All these issues have formed a strong urge to initiate a sound environmental governance structure. The Treaty, which is developed under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ Treaty), was adopted in June 2023, and the framework is expected to address the challenges mentioned above through the introduction of an Environmental Impact Assessment (EIA) framework. The paper will critically assess if the BBNJ EIA framework enhances high seas governance, particularly in terms of its legal soundness, applicability, and enforceability. Using doctrinal legal research, treaty analysis, and a comprehensive review of case law and case studies, the research assesses the conformity of the framework with the current principles of international environmental law, locates the problems of implementation, and suggests the legal reforms to be made in the future. The analysis indicates that the framework effectively incorporates precaution, transparency, and equity, but it also exposes multiple shortcomings that relate to state-centric decision-making procedures, hidden ambiguities in the law, and the absence of enforcement procedures. The paper, through its questioning of a wide range of case studies, such as deep-sea mining and fisheries management of the region, promotes a series of practical recommendations to make the EIA process more effective, which would benefit the international law community and the enhancement of sustainable management of the high seas.

**Keywords:** Environmental Impact Assessment, BBNJ Treaty, High Seas Governance, International Environmental Law, Marine Biodiversity

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### Introduction

The high seas, comprising approximately 64% of the global ocean and constituting nearly half of Earth's surface, constitute a vital global common that is crucial for ecological stability, climate regulation, and socioeconomic benefits.<sup>[1]</sup> Under the United Nations Convention on the Law of the Sea (UNCLOS), the high seas are subject to competing legal principles: the freedom of access, which permits navigation, fishing, and scientific research, and the common heritage of humankind, which emphasizes collective responsibility for resource conservation.<sup>[2]</sup> Governance issues are aggravated by increasing threats, and 33 percent of the evaluated marine life is under threat of extinction, 17 million tonnes of plastics pollute

the oceans every year, and climate-induced ocean acidification is an ecosystem disruption.<sup>[3]</sup> UNCLOS presents a general duty to conserve the marine environment and requires Environmental Impact Assessment (EIA) of activities with high impact, but its provisions are not specific and lack mechanisms of implementation, which require high-level environmental law provisions.<sup>[4]</sup>

Environmental law plays a pivotal role in high seas governance by operationalizing UNCLOS obligations through principles such as precaution, ecosystem-based management, and transboundary cooperation. The principles are needed to control such activities as industrial fishing, deep-sea mining, and bioprospecting, which are cumulative and transboundary threats to marine life.<sup>[5]</sup> The high seas' ecological significance---supporting global biodiversity and carbon sequestration---and its geopolitical importance, as a contested arena for resources such as marine genetic resources, underscore the urgency of robust legal frameworks that balance conservation with sustainable use.<sup>[6]</sup>

The BBNJ Treaty, adopted on 19 June 2023, is a historic milestone in the field of international environmental law, as it is the first legally binding instrument to protect and sustainably use marine biodiversity in ABNJ.<sup>[7]</sup> The treaty that was negotiated for almost 20 years deals with four fundamental pillars: marine genetic resources and benefit-sharing, area-based management tools (such as marine protected areas, or MPAs), EIAs, and capacity building and technology transfer.<sup>[8]</sup> The EIA framework, which is outlined in Articles 22 through 39, is a pillar of the treaty, which standardizes the evaluation and enhances transparency via a clearinghouse mechanism, as well as supporting global biodiversity goals, including the Kunming-Montreal Global Biodiversity Framework target to conserve 30 percent of the ocean by 2030.<sup>[9]</sup>

The BBNJ EIA framework also addresses activities within the jurisdiction or control of a state that can impose more than a minor or transitory impact on ABNJ ecosystems, with a precautionary threshold to ensure the broadest understanding of the activities, i.e., fishing, deep-sea mining, and new activities such as geoen지니어ing.<sup>[10]</sup> The framework has a four-stage process, which includes screening to establish the need for EIA, scoping to identify key impacts, impact assessment based on the best available science and traditional knowledge, and mitigation to ensure that significant harm is prevented, with the process being assisted by means of a centralized clearinghouse mechanism.<sup>[11]</sup> It is interconnected with the other pillars of the treaty; it supports MPAs, and it requires cooperation with regional and sectoral organizations, including regional fisheries management organizations (RFMOs), and the Scientific and Technical Body (STB) oversees it, yet ultimate decision-making rests with the states.<sup>[12]</sup>

This paper addresses the central research question: To what extent does the EIA framework under the BBNJ Treaty effectively strengthen high seas governance to ensure the conservation and sustainable use of marine biodiversity in ABNJ? The study is significant for its timely evaluation of a novel legal instrument amid escalating ecological and geopolitical pressures in the high seas. It contributes to international law scholarship by analyzing the BBNJ EIA framework's legal innovations, practical implementation challenges, and potential to shape sustainable high seas governance, offering insights for policymakers, scholars, and practitioners.<sup>[13]</sup>

The study aims to examine the legal framework of BBNJ EIAs, its scope, process, and adherence to the principles of international environmental law; the strengths and weaknesses of the framework, such as its consistency with the principles of customary international law and the current treaties; the practical implementation issues, including the gaps in jurisdiction, the problem of enforcement, and the geopolitical tensions; and suggest legal and policy reforms to improve the effectiveness of EIA, including

through the mechanisms of compliance, international cooperation, and capacity building of the developing states.

It combines doctrinal legal research, treaty analysis, and case law review as the methodology to give a complete legal assessment, which is rigorous and relevant. The systematic study of legal texts and norms, such as the BBNJ Treaty, UNCLOS, and peer-reviewed works to interpret and criticize the EIA framework, is called doctrinal legal research.<sup>[14]</sup> The Vienna Convention on the Law of Treaties is the basis of the treaty analysis, which focuses on the text, drafting history, and context of the BBNJ Treaty to explain the obligations of states and legal ambiguities.<sup>[15]</sup> The review of case law assesses judicial decisions and advisory opinions (including those of the International Tribunal for the Law of the Sea (ITLOS)) to put BBNJ EIAs' enforcement potential into perspective in terms of international law.<sup>[16]</sup> This is a multi-faceted method that incorporates both qualitative assessment of the legal texts, UN reports, and academic literature and provides a strong assessment of the effectiveness of the BBNJ EIA framework.

### Legal and Institutional Framework

The international legal regime that governs the high seas is rooted in the United Nations Convention on the Law of the Sea (UNCLOS), which ascribes the designation "high seas" to waters that lie beyond national jurisdiction and delineates essential principles for their utilization and preservation. UNCLOS provides the state with the right to freedom of navigation, fishing, and scientific research, but at the same time, it places responsibilities on the state to protect the marine environment and carry out environmental impact assessments (EIAs) of actions that can result in generating a significant amount of pollution or large-scale damage.<sup>[17]</sup> Nonetheless, the EIA provision within UNCLOS is markedly ambiguous, lacking detailed implementation mechanisms, and its state-centric orientation is ill-suited to address the transboundary and cumulative impacts that arise from activities in areas beyond national jurisdiction (ABNJ), such as deep-sea mining and industrial fishing.<sup>[18]</sup> Additional environmental standards support the UNCLOS system, among them the Convention on Biological Diversity (CBD), which promotes biodiversity conservation and sustainable use through voluntary EIA guidelines, and the Kunming-Montreal Global Biodiversity Framework, which presents ambitious goals of ocean protection.<sup>[19]</sup> The regional treaties, such as the Convention on the Protection of the Marine Environment of the North-East Atlantic (OSPAR), are also examples of providing models of EIA processes and stakeholder involvement but they are limited to specific areas.<sup>[20]</sup> Deep-sea mining in ABNJ is regulated by the International Seabed Authority (ISA), established based on UNCLOS Part XI but the EIA requirements have often been criticized for prioritizing the interests of industries over environmental protection, thus providing the need to have a stronger global framework.<sup>[21]</sup>

These shortcomings are addressed by a legally binding framework of marine biodiversity conservation and sustainable use enacted as the Biodiversity and Marine Genetic Resources (BBNJ) Treaty under the UNCLOS in June 2023, which also makes up a major step forward in international environmental law.<sup>[22]</sup> The legal basis of the treaty is based on the mandate of UNCLOS enabling the protection of the marine environment and emphasizes cooperative governance and includes four pillars: marine genetic resources and equitable benefit-sharing, area-based management tools, including marine protected areas (MPA), EIAs, and capacity building and technology transfer.<sup>[23]</sup> The treaty is bound by the law of UNCLOS, and it does not contradict existing regimes (the ISA and regional fisheries management organizations, also called RFMOs) under the principle of not undermining, which states that the provisions of BBNJ must not undermine the effectiveness of other legal instruments.<sup>[24]</sup> The BBNJ Treaty creates institutional structures to oversee its implementation by creating a Conference of Parties (COP) and a Scientific and Technical Body (STB), which is an indication that the treaty will adopt a

more centralized governance framework that balances state sovereignty with shared environmental accountability.<sup>[25]</sup>

The EIA requirements of the BBNJ Treaty, which are captured in Articles 22 to 39, form one of the pillars of its legal framework and reflect major concepts of international environmental law, such as the precautionary principle, sustainable development, and state responsibility. The precautionary principle is fulfilled by a low threshold of EIAs, which require the assessment of activities that could generate effects at more than a minor or transient level, and thus proactive action in regard to the lack of knowledge in science.<sup>[26]</sup> The concept of sustainable development is echoed in the combination of MPAs and the contractual goal to reconcile the environmental protection with the sustainable use of ABNJ resources, which is in line with global biodiversity targets.<sup>[27]</sup> The duty of states to ensure that the activities under their jurisdiction or control meet EIA requirements supports state responsibility as is consistent with customary international law as affirmed by the International Court of Justice in its judgement on the Pulp Mills on the River Uruguay case.<sup>[28]</sup> The EIA process that consists of screening, scoping, impact assessment, and mitigation requires the use of the best available science and traditional knowledge, whereby the public consultation is facilitated by a centralized clearinghouse mechanism, hence providing transparency and stakeholder involvement.<sup>[29]</sup> Strategic Environmental Assessments (SEAs) are presented to mitigate the effects at the regional and ecosystem level, which improves the ecosystem-based approach of the framework.<sup>[30]</sup> These conditions make the BBNJ Treaty a leader in the realm of international environmental law and resort to the best practices based on the CBD, Espoo Convention, and regional arrangements like OSPAR.<sup>[31]</sup>

### Conceptualizing Environmental Impact Assessment in High Seas Law

The Environmental Impact Assessment (EIA) in international law is perceived as an organized process to identify, forecast, assess, and reduce the environmental impact of planned activities before their execution, thereby allowing an informed decision-making process and protecting environmental integrity. In their 2010 ruling on the Pulp Mills on the River Uruguay, the International Court of Justice recognised EIAs as a customary international law requirement that applies to the activities that have major transboundary impacts, thus highlighting the requirement by states of due diligence to evaluate and mitigate harmful effects.<sup>[32]</sup> This requirement is also strengthened by UNCLOS, which requires states to carry out EIAs of activities within their jurisdiction or control that could result in substantial pollution or major harmful changes to the marine environment but provides no specific procedural direction.<sup>[33]</sup> The BBNJ Treaty markedly extends this framework by institutionalizing a comprehensive and standardized EIA process for Areas Beyond National Jurisdiction (ABNJ), mandating assessments for activities exerting more than a minor or transitory effect, integrating the best available science and traditional knowledge, facilitating public participation through a clearinghouse mechanism, and requiring mitigation measures to avert significant harm.<sup>[34]</sup> This procedure is in line with the current standards of the environmental law, which rely on the voluntary EIA guidelines of the Convention on Biological Diversity, as well as the transboundary assessment requirements of the Espoo Convention.<sup>[35]</sup>

The application of EIAs within the high seas presents unique legal challenges, primarily due to the global commons character of ABNJ, which complicates both jurisdictional attribution and enforcement. Jurisdictional gaps arise because states exercise control over activities, such as vessels or corporations, yet not over the high seas themselves, engendering ambiguity in assigning responsibility for environmental harm.<sup>[36]</sup> The lack of some central authority in ABNJ is the hindrance to its enforcement, as the compliance is oftentimes contingent upon flag states whose economic aspects often override environmental concerns, illustrated by lax regulatory measures in the deep-sea mining and fishing.<sup>[37]</sup> Scientific uncertainty is another serious challenge; the deep-sea ecosystem has not been fully studied,

and there is little information on species distribution and ecological interactions, which compromises the accuracy of EIA.<sup>[38]</sup> States with developing economies, especially, face capacity issues, as they do not have any technological and scientific means to perform the strong EIAs, even though capacity building is a key point of the BBNJ Treaty.<sup>[39]</sup>

Jurisprudential debates further illuminate the complexities of high seas EIAs, focusing on the scope of state and non-state actor obligations under international law. This case of Pulp Mills by the ICJ confirmed the existence of a due-diligence duty to carry out EIAs for activities with transboundary effects, but it is not applicable to ABNJ due to the lack of territorial jurisdiction.<sup>[40]</sup> Following the 2023 advisory opinion on climate change by the ITLOS, the interpretation of the UNCLOS was broadened, and climate change was deemed a type of marine pollution, and it was proposed that states' EIA responsibility should be extended to the transboundary environmental effects, even in ABNJ.<sup>[41]</sup> The South China Sea Arbitration (2016) further elaborated the responsibility of states with the view that states ought to ensure that the activities within their control, including fishing, do not engage in activities that harm the environment even in disputed areas, which also provides a precedent to govern ABNJ.<sup>[42]</sup> Corporations that are involved in deep-sea mining are considered non-state actors that create more liability issues; researchers believe that states should impose liability on the non-state actors under the customary law, yet the provisions of the BBNJ Treaty on this aspect are unclear.<sup>[43]</sup> These debates underscore the imperative for the BBNJ Treaty to clarify obligations, strengthen enforcement mechanisms, and address the distinctive challenges inherent in high seas EIAs.

### **A Critical Analysis of the Treaty Focuses on the BBNJ and Its Environmental Impact Assessment (EIA) Framework**

The BBNJ Treaty's Environmental Impact Assessment (EIA) framework, delineated in Articles 22 through 39, constitutes a noteworthy development in the governance of high-seas areas, furnishing a structured and legally binding procedure for evaluating and mitigating environmental impacts in areas beyond national jurisdiction (ABNJ). Detailed analysis of the clause by clause makes the exhaustive nature of the framework apparent. Article 22 requires states to undertake EIAs regarding activities within their jurisdiction or control that could have more than a negligible or temporary impact on ABNJ ecosystems with a precautionary threshold that covers a wide range of activities, including industrial fishing and new activities, such as geoengineering.<sup>[44]</sup> Article 23 demands the cooperation of the national level with the relevant international and regional organizations---the Regional Fisheries Management Organizations (RFMOs) and the International Seabed Authority (ISA)---to ensure that it is integrated with the existing structures, thus creating a unified model of governance.<sup>[45]</sup>

Articles 24 through 27 describe the four-stage process of EIA: screening to identify the need of EIA; scoping to identify the key impacts and alternatives; impact assessment using the best available science and traditional knowledge; and mitigation to avoid the major negative effects and the public consultation is fostered by a centralized clearinghouse mechanism to enhance transparency.<sup>[46]</sup> Article 29 proposes Strategic Environmental Assessments (SEAs), which are used to assess the impact of a region or ecosystem, thus supporting ecosystem-level management and in line with global biodiversity goals.<sup>[47]</sup> Article 34 empowers the Scientific and Technical Bureau (STB) to examine EIA reports in compliance, thus adding a scientific quality control, whereas Article 38 emphasizes the establishment of capacities and technology transfer to enable the involvement of developing states, which removes inequities of ABNJ governance.<sup>[48]</sup>

The BBNJ EIA framework is closely associated with customary international law, which was established by the International Court of Justice in the Pulp Mills case that recognized EIAs as a customary

requirement for activities that have a high transboundary impact.<sup>[49]</sup> It is also based on the best practice traditions of the existing treaties, including the voluntary EIA guidelines of the Convention on Biological Diversity, that promote scientific rigor and stakeholder consultation, or the mandatory transboundary assessment requirements of the Espoo Convention, which insist on consultation with affected parties.<sup>[50]</sup> However, the BBNJ Treaty does not follow centralized models, as was the case with the Antarctic Treaty System, where the Commission has the binding decision-making authority; the BBNJ framework is state-centered in decision-making, which may weaken enforcement mechanisms.<sup>[51]</sup>

Along with its advantages, the BBNJ EIA framework is fraught with possible conflicts and ambiguities, which can affect its effectiveness. Article 4, which is the so-called principle of not undermining, prohibits the weakening of legal instruments that were in place before BBNJ but has a loose formulation that can be used to undermine the stricter EIA standards of BBNJ in favor of weaker sectoral instruments, especially in the case of deep-sea mining.<sup>[52]</sup> Article 22 of the term "jurisdiction" or "control" does not provide a specific definition, creating confusion about the accountability of the state over non-state actors, including corporate entities that may participate in bioprospecting or geoengineering, which makes it difficult to identify who should bear the liability.<sup>[53]</sup> The lack of enforcement also implies the ineffectiveness of the framework, as the BBNJ Treaty does not establish binding sanctions and a specific dispute-resolution mechanism to address the breach of the EIA, relying instead on the UNCLOS Part 15 that has not been tested yet in the context of ABNJ biodiversity regulation.<sup>[54]</sup> The review role of the STB and the clearinghouse mechanism contribute to the transparency and monitoring of compliance, but their effectiveness in operation relies on cooperation between states, which may not be uniform in economic and geopolitical strains.<sup>[55]</sup>

The compliance, dispute resolution, and transparency processes integrated in the BBNJ EIA framework are new but limited. The clearinghouse mechanism gives the public access to EIA reports, which promotes global scrutiny and stakeholder participation, which is in line with the principles of access to environmental information in the Aarhus Convention.<sup>[56]</sup> A scientific check is that the STB can examine EIA reports to ensure their compliance, but due to its absence of binding power, its influence is less significant compared to compliance committees in other multilateral environmental treaties, including the Convention on International Trade in Endangered Species (CITES).<sup>[57]</sup> Article 55, included in Part XV of the UNCLOS (which is a legal remedy to dispute resolution, but which is mainly applicable to state-to-state disputes), offers a legal solution to non-compliance by non-state actors or a failure of the system.<sup>[58]</sup> These shortcomings highlight the need to have more effective enforcement mechanisms to ensure the effectiveness of the BBNJ EIA framework in the governance of the high seas.

### Case Studies and Comparative Jurisprudence

The experience in the practical implementation of environmental impact assessments (EIAs) to the governance of the high seas provides important conclusions about the opportunities and difficulties of the Biodiversity Beyond National Jurisdiction (BBNJ) Treaty, as demonstrated through various case studies and comparative reviews with other international environmental regulations. One prominent case study concerns the International Seabed Authority's (ISA) regulation of deep-sea mining in the Clarion-Clipperton Zone, a mineral-rich sector of the Pacific Ocean's seabed in areas beyond national jurisdiction (ABNJ).<sup>[59]</sup> The ISA, which is established as part of the UNCLOS Part XI, requires EIAs to be conducted in relation to mining activities but its provisions are weaker than those provided by the BBNJ Treaty, which places the interests of the industry above environmental safety.<sup>[60]</sup> As an example, the environmental management plan of the Clarion-Clipperton Zone by the ISA in 2023 authorized exploration mining with no cumulative impact evaluation, which is a cause of concern due to the damage to the ecosystem of deep-sea habitats of unique species with slow growth rates.<sup>[61]</sup> This case also

presents a potential conflict with the principle of the BBNJ Treaty, which states that it should not be undermined because the weaker EIA standards of the ISA may undermine those of the stronger BBNJ Treaty, and thus the case would require more precise legal guidance to align with the treaty.<sup>[62]</sup>

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) is another important case study that controls fisheries and marine protected areas (MPAs) in the Southern Ocean, an area partially covering ABNJ. The EIA procedures used by CCAMLR to designate MPAs include ecosystem-based management and consultation with stakeholders, which necessitate in-depth analyses of impacts of fishing on Antarctic ecosystems.<sup>[63]</sup> The ability of CCAMLR to bring scientific data and traditional knowledge together in EIAs presents an interesting example to the provisions of the BBNJ Treaty strategic environmental assessment (SEA) provisions, which focus on regional impacts.<sup>[64]</sup> However, the consensus-driven approach of decision-making at CCAMLR has not been devoid of issues, and such nations as Russia and China have blocked the establishment of new MPAs based on economic reasons, thus demonstrating the geopolitical obstacles that the BBNJ Treaty needs to overcome.<sup>[65]</sup>

The South Pacific Regional Fisheries Management Organisation (SPRFMO) provides a further case study, focusing on fisheries management in the South Pacific high seas. The bottom-fishing regulations of SPRFMO (2019) state that EIAs should be conducted to determine the effects of trawling on vulnerable marine ecosystems, including seamounts and corals, in a precautionary manner.<sup>[66]</sup> Although the EIA procedure of SPRFMO is similar to BBNJ, with its focus on science-based evaluation, its implementation is limited by the poor state adherence to it, and some flag states do not conduct a sufficient level of monitoring of vessels.<sup>[67]</sup> This example shows that the BBNJ Treaty should be more effective in enforcement mechanisms and should align with Regional Fisheries Management Organizations (RFMOs) to ensure consistency in EIA standards.<sup>[68]</sup>

In the Pulp Mills on the River Uruguay case, which was ruled by the International Court of Justice (ICJ) in 2010, there is a judicial approach to the topic of EIA obligations, although not directly in the context of ABNJ. The ICJ found that, by not carrying out a transboundary EIA of a pulp mill on a common river, Uruguay had breached its due diligence measures and thus established the legitimacy of EIAs as customary international law.<sup>[69]</sup> The mentioned precedent is relevant to the BBNJ Treaty since it also highlights the duty of states to evaluate transboundary consequences, which apply to ABNJ operations that impact neighboring exclusive economic zones (EEZs).<sup>[70]</sup> The South China Sea Arbitration (2016) also upholds this principle; the Permanent Court of Arbitration stated that the inability of the Philippines to ensure that fishing in the disputed waters did not cause any environmental damage was also a violation of UNCLOS and created a legal ground to extend the state responsibility to the ABNJ.<sup>[71]</sup> These examples show that the BBNJ Treaty has the potential to capitalize on customary law and indicate that the idea of non-state actor liability needs to be clarified.

The Deep Seabed Mining Advisory Opinion (2011) of the International Tribunal for the Law of the Sea, Seabed Disputes Chamber, gives more information explaining that sponsoring states have an obligation of due diligence to guarantee that mining contractors undertake EIAs and reduce damage in ABNJ.<sup>[72]</sup> Such a view justifies the state-responsibility principle of the BBNJ Treaty but discloses the lack of clarity in the corporate accountability approaches, as the provisions of the Treaty regarding non-state actors are unclear.<sup>[73]</sup> Lastly, the 2015 Chagos Marine Protected Area Arbitration concerned the United Kingdom's unilateral designation of the MPA in the Indian Ocean; the tribunal was displeased with the absence of consultation with the affected states, which the BBNJ MPA-related EIAs must consider.<sup>[74]</sup>

Compared to it, the BBNJ EIA framework is more advanced than the UNCLOS Article 206: simple requirements, but less developed in comparison to the compulsory transboundary consultations under

the Espoo Convention, which ensures the participation of the affected states.<sup>[75]</sup> The voluntary EIA guidelines provided by the Convention on Biological Diversity are consistent with the scientific orientation of BBNJ, but they are not binding, and thus, they can hardly be imposed.<sup>[76]</sup> The regional EIA criteria of the OSPAR Convention, which focus on stakeholder involvement and cumulative impact evaluations, provide an example of the cooperation criteria of the BBNJ, especially when it comes to strategic environmental assessment.<sup>[77]</sup> The EIA process of scientific activities in the Antarctic Treaty System is centralized, which is an alternative to the state-centered approach of BBNJ, which may have an opportunity to be more institutionally controlled.<sup>[78]</sup>

These comparative analyses and case studies have important lessons to implement BBNJ. The ecosystem-based EIAs of CCAMLR highlight the importance of SEAs and collaboration between stakeholders that must be considered in the BBNJ Treaty to consider the impact at a regional level.<sup>[79]</sup> The lower standards of the ISA indicate that the BBNJ should impose stricter conditions of EIA and thus avoid being subordinated to the sectoral regimes.<sup>[80]</sup> The issues of enforcement of SPRFMO highlight the need to have strong compliance measures in place; the case of the Pulp Mills and South China Sea determines the customary nature of EIAs, which justifies the legal basis of BBNJ but also reveals gaps in its implementation.<sup>[81]</sup> Based on this, the BBNJ Treaty should improve coordination with RFMOs, clarify liability of non-state actors, and use judicial principles to make its EIA framework more effective.

### Challenges in Implementation and Enforcement

The adoption and enforcement of the BBNJ EIA framework face significant legal, political, and practical obstacles that compromise the prospects of improving the management of high-seas maritime areas. The state-centricity of the decision-making process of the BBNJ Treaty is a significant challenge in terms of the law, as states still have the right to approve activities on the basis of EIA findings, and it may be considered that they put their economic interests above environmental protection.<sup>[82]</sup> The practice is an alternative to more centralized systems, including the Antarctic Treaty System, where a commission has binding jurisdiction and where there is a risk of non-uniform implementation of EIA standards, especially by those states with a strong commercial interest in ABNJ, including China and Norway.<sup>[83]</sup> The overlaps with the status quo in the jurisdiction, like RFMOs and the ISA, introduce regulatory fragmentation, because the principle of not undermining can force BBNJ to adhere to more lax sectoral standards, hence compromising its precautionary agenda.<sup>[84]</sup> The lack of enforcement by binding sanctions or a special dispute-resolution mechanism concerning the violation of EIA further hinders the enforcement, drawing on Part XV of the UNCLOS, which is not tested in the context of ABNJ biodiversity issues.<sup>[85]</sup>

The statutory practice indicates that there are considerable inequalities in complying with statutes. Strong EIA procedures for high-shelf activities, including fisheries management, have been implemented in developed states, including Australia and the European Union, but not in other states, especially flag states, with weak oversight, as exemplified by the inconsistent monitoring of bottom-fishing by the SPRFMO.<sup>[86]</sup> These problems are intensified by geopolitical tensions and the fact that major powers are struggling over the resources in ABNJ, including marine genetic resources and minerals, which leads to the emergence of resistance to strict EIA requirements.<sup>[87]</sup> Both COP and STB are central to the implementation coordination but because they lack the authority to enforce compliance, especially in situations where states are driven by economic gains, which is demonstrated by the mining approvals of the ISA.<sup>[88]</sup>

New problems also make the implementation more complicated. The technological constraints also prevent the efficient tracking of high-shelf operations since the ABNJ is very big and thus requires sophisticated satellite technology and autonomous vehicles, which are very expensive and unavailable to numerous states.<sup>[89]</sup> Deficiencies in knowledge about scientific data for deep-sea ecosystems, like species connectivity and resilience, reduce the accuracy of the EIA, and developing states are more vulnerable to such issues due to a lack of research capacity.<sup>[90]</sup> The dilemma of balancing economic interests and environmental conservation has been a permanent issue, with activities like deep-sea mining and industrial fishing being the major income earners but extremely dangerous to the ecology, as witnessed in the Clarion-Clipperton Zone.<sup>[91]</sup> The capacity-building provisions of the BBNJ Treaty are designed to address these discrepancies but the absence of specific mechanisms and timelines to fund the provisions limits the capacity to do so.<sup>[92]</sup>

### Conclusion

The Environmental Impact Assessment (EIA) framework of the BBNJ Treaty is a critical step in the governance of the high seas, with precautionary, transparent, and equitable principles being included to address the growing dangers of biodiversity loss, pollution, and climate change in Areas Without National Jurisdiction (ABNJ). The treaty standardizes EIA processes, promotes the involvement of people, and supports the establishment of Marine Protected Areas (MPAs), which makes it consistent with the global goals of biodiversity and the development of the environmental responsibilities of the United Nations Convention on the Law of the Sea (UNCLOS).<sup>[93]</sup> Its main strengths are the precautionary threshold, scientific strength, and integration with ecosystem-based management as supported by its consistency with customary international law and best practice based on multilateral environmental treaties like the Convention on Biological Diversity (CBD) and the Espoo Convention.<sup>[94]</sup> However, the effectiveness of the framework is limited by the state-centered decision-making, lack of clarity in laws, especially in the "not undermine" principle, and severe enforcement gaps, such as the lack of binding sanctions or a specific dispute-resolving mechanism.<sup>[95]</sup>

The practical implementation of the framework is further complicated by barriers to implementation, particularly the issue of jurisdiction overlaps, scientific uncertainty, and geopolitical pressure, which are very distinctly reflected in case studies, including the ISA deep-sea mining operations, MPAs of the CCAMLR, fisheries management of SPRFMO, and judicial precedents like the Pulp Mills case and the South China Sea conflict.<sup>[96]</sup> These examples support the urgency to better coordinate their actions with the existing regimes, liability frameworks against non-state actors, and surveillance capabilities.<sup>[97]</sup> The suggested reforms include: (1) the creation of a binding compliance framework with specific sanctions for non-compliance; (2) centralization of Scientific and Technical Body (STB) control with binding decision-making authority; (3) necessity of Specific Environmental Assessment mechanisms with mandatory regional coordination; (4) clarification of corporate liability and non-state actor accountability; (5) establishment of dedicated funding mechanisms for capacity building in developing states; (6) harmonization of EIA standards across sectoral regimes including RFMOs and ISA; and (7) development of robust monitoring, reporting, and verification systems for high seas activities.<sup>[98]</sup>

To conclude, while the BBNJ EIA framework represents a significant advancement in international environmental law and ocean governance, its success depends critically on overcoming implementation barriers through stronger enforcement mechanisms, clearer legal standards, improved international cooperation, and adequate resource allocation to developing states. The framework's effectiveness in protecting marine biodiversity in areas beyond national jurisdiction will ultimately determine whether the international community can meet the ambitious goals of the Kunming-Montreal Global

Biodiversity Framework and ensure sustainable management of our shared ocean resources for future generations.

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- [98] Comprehensive recommendations synthesized from case study analyses and implementation challenges reviewed throughout the paper.