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EDITED BY

Mehran Idris Khan,
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Economics, China

REVIEWED BY

Muneeba Javid,
Dalian Maritime University, China
Muhammad Fahad Anwar,
University of Sahiwal, Pakistan

*CORRESPONDENCE

Chuanliang Wang
✉ clwang@sdsu.edu.cn

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On the implementation of the provisions regarding environmental impact assessments under the BBNJ agreement

Chuanliang Wang^{1,2,3,4*} and Yuxin Li¹

¹School of Law, Shandong Normal University, Jinan, China, ²School of Law, Dalian Maritime University, Dalian, China, ³School of Law, Tsinghua University, Beijing, China, ⁴Marine Academy of Zhejiang Province, Hangzhou, China, ⁵School of Marxism, Shandong Normal University, Jinan, China

The Agreement 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 Agreement) was adopted on June 19, 2023. Part IV of the BBNJ Agreement focuses on the environmental impact assessments (EIAs) in areas beyond national jurisdiction (ABNJ) from the following aspects: objectives and the general obligation of Parties to conduct EIAs, the relationship between BBNJ Agreement and EIA processes under relevant legal instruments and frameworks and relevant bodies, the EIA process, monitoring and review mechanisms, the function of the Scientific and Technical Body, and Strategic Environment Assessment. However, to facilitate the adoption of the Agreement, many compromises were made by the Parties. As a package agreement, the provisions regarding EIAs under the BBNJ Agreement are ambiguous and contain gaps. Moreover, during the implementation of the Agreement, different Parties have different interests and positions, which poses challenges for implementing the provisions. For example, environmental NGOs advocate for the strict application of the precautionary principle, which necessitates demonstrating the absence of significant environmental impact before the approval of potentially harmful activities. In contrast, major fishing nations prefer to rely on existing regional management frameworks to prevent redundant assessments and avoid additional economic burdens. In this regard, attention should be given to the overall interests and needs of the international community, and the effective implementation of the provisions regarding EIAs under the Agreement should be promoted through refining the regulations of the Agreement, establishing cooperative mechanisms, and creating frameworks for shared benefits.

KEYWORDS

the BBNJ agreement, environmental impact assessments, areas beyond national jurisdiction, ocean governance, implementation

1 Introduction

On June 19, 2023, delegates from 193 United Nations Member States finally adopted the *Agreement 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 Agreement).¹ The Agreement serves as the third implementing agreement of the *United Nations Convention on the Law of the Sea* (UNCLOS). It marks the beginning of a new chapter in the global ocean governance in areas beyond national jurisdiction (ABNJ).

Part IV of the BBNJ Agreement explicitly states the advancement of the implementation of the provisions related to environmental impact assessments (EIAs) in ABNJ under UNCLOS. It aims to establish a harmonized EIA framework for activities in ABNJ, to prevent or minimize environmental hazards or damage and to protect and preserve the marine environment.² The Agreement contains 13 articles in this part and provides relevant provisions on EIAs from the following aspects:

- Objectives and the general obligation of Parties to conduct EIAs³
- The relationship between the BBNJ Agreement and EIA processes under relevant legal instruments and frameworks and relevant bodies⁴
- The process for EIAs⁵
- Monitoring and review mechanisms⁶
- The function of the Scientific and Technical Body⁷
- Strategic Environment Assessment⁸

However, the negotiation of the BBNJ Agreement took 19 years and involved significant disagreements among countries regarding its specific institutional arrangements. The Agreement not only addresses the protection of the marine environment but also directly relates to each Party's maritime strategies, marine rights and interests, as well as their positions in the international maritime order. As a result, even though the BBNJ Agreement has been adopted and establishes an EIA framework for ABNJ, as a package agreement, the BBNJ Agreement contains some ambiguous provisions and blanks due to the differences in the specific positions and interests of the Parties involved. Consequently, the

implementation of the provisions for EIAs under the BBNJ Agreement still faces numerous challenges. It is essential to adopt methods of historical analysis, case analysis and normative analysis as the methodology for conducting a treaty implementation study. In view of that, this paper examines the implementation of the provisions for EIAs under the BBNJ Agreement as follows: First, it outlines the core provisions related to EIAs under the BBNJ Agreement. Second, it analyzes the potential challenges faced in implementing the provisions for EIAs under the Agreement. At last, it discusses strategies for addressing the challenges associated with the provisions for EIAs under the Agreement.

2 Core contents of the provisions regarding EIAs under the BBNJ agreement

Part IV of the BBNJ Agreement provides systematic provisions regarding EIAs with 13 articles. The specific contents are as follows:

2.1 Objectives and the general obligation of parties to conduct EIAs

Article 27 of the BBNJ Agreement stipulates the objectives of EIAs. By establishing procedures, thresholds, and other requirements, the provisions on EIAs for ABNJ under UNCLOS are operationalized to ensure that relevant activities are assessed and conducted, to prevent, mitigate, and manage significant adverse impacts, thus protecting and preserving the marine environment. At the same time, special attention is given to capacity-building regarding EIAs for developing country Parties, particularly the least developed countries, landlocked developing countries, geographically disadvantaged States, small island developing States, coastal African States, archipelagic States and developing middle-income countries, in support of the objectives of this Agreement. In light of the technical and capacity challenges faced by these countries in conducting EIAs, the Agreement not only highlights the necessity of technical assistance and cooperation but also encourages the international community and developed countries to offer support. This includes providing resources, expertise, and knowledge sharing to enhance the EIA capacities of these countries.

Article 28 of the BBNJ Agreement stipulates the general obligation for all Parties to conduct EIAs. Parties shall ensure that the potential impacts on the marine environment of planned activities under their jurisdiction or control that take place in ABNJ are assessed as set out before they are authorized. This not only helps to clarify the implementation boundaries of EIAs and reduce unnecessary disputes but also enhances the operability of the Agreement and lays a foundation for subsequent monitoring and review processes.

Moreover, Article 29 (4) of the BBNJ Agreement provides that it is not necessary to conduct a screening or an EIA of a planned activity in ABNJ if the potential impacts of the planned activity or

1 UN, Agreement 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, <https://documents-dds-ny.un.org/doc/UNDOC/LTD/N23/177/28/PDF/N2317728.pdf?OpenElement>, last visited on 22 December 2024.

2 BBNJ Agreement, Article 27.

3 BBNJ Agreement, Articles 27–28.

4 BBNJ Agreement, Article 29.

5 BBNJ Agreement, Articles 30–34.

6 BBNJ Agreement, Articles 35–37.

7 BBNJ Agreement, Articles 38, 28 (3), 29(2), 29(3), 29(3), 31(1), 33(4), 36(3), 37(3).

8 BBNJ Agreement, Articles 39, 27(4), 27 (6), 38 (1).

category of activity have been assessed in accordance with the requirements of other relevant legal instruments or frameworks or by relevant global, regional, subregional or sectoral bodies. This is a further provision and embodiment of the “Not Undermine” clause⁹ in the BBNJ Agreement (Kim, 2024). If other treaties, such as UNCLOS, Convention on Biological Diversity, Espoo Convention, or IMO instruments, stipulate relevant requirements, such provisions shall prevail.

2.2 The EIA process

Article 31 of the BBNJ Agreement sets out the procedural framework for Parties to conduct EIAs, consisting of the following four steps: Firstly, Parties are required to screen and determine whether planned activities under their jurisdiction or control require EIAs and make their determination publicly available. When a planned activity may have more than a minor or transitory effect on the marine environment, or the effects of the activity are unknown or poorly understood, the Party with jurisdiction or control of the activity shall undertake screening. The screening shall be sufficiently detailed and consider factors such as the type of and technology used for the activity, the duration of the activity, and the location of the activity.¹⁰ Secondly, Parties should define the scope of the assessment. Key environmental impacts, any associated impacts, and alternatives to the planned activity need to be identified. Parties should use the best available science and scientific information and, where available, relevant traditional knowledge of Indigenous Peoples and local communities to assess and evaluate the impacts of the planned activities. Thirdly, conduct the assessment and evaluation of impacts. Fourthly, measures should be taken to prevent, mitigate, and manage any potential adverse impacts.

Article 32 of the BBNJ Agreement stipulates the public notification and consultation procedures for Parties. Parties shall ensure timely notification of a planned activity through the Clearing-House Mechanism and the secretariat, allowing stakeholders, including but not limited to coastal States, fishing communities, research institutions, non-governmental organizations, and the public, to participate in the process for EIAs. Where a planned activity affects areas of the high seas that are entirely surrounded by the exclusive economic zones of States, Parties shall undertake targeted and proactive consultations, with such surrounding States.

Article 33 of the BBNJ Agreement stipulates the procedures for Parties to prepare and publish EIA reports. The EIA report shall include, at a minimum, the required information such as a description of the planned activity, a description of potential impacts, a description of potential prevention, mitigation and management measures, a description of the consideration of reasonable alternatives to the planned activity and a description of follow-up actions. The Party shall give consideration to any

comments made by the Scientific and Technical Body (STB) and publish the reports of the EIAs, through mechanisms including the Clearing-House Mechanism.

Article 34 of the BBNJ Agreement sets out the decision-making procedures. Parties are responsible for determining whether planned activities under their jurisdiction or control may proceed and for making authorization decisions. Decision documents shall clearly outline any conditions of approval related to mitigation measures and follow-up requirements and be made public through mechanisms including the Clearing-House Mechanism.

2.3 Monitoring and review mechanisms

Article 35 of the BBNJ Agreement stipulates that Parties shall keep under surveillance the impacts of any activities in ABNJ that they permit or in which they engage in order to determine whether these activities are likely to pollute or have adverse impacts on the marine environment. In particular, each Party shall monitor the environmental and any associated impacts of an authorized activity under their jurisdiction or control in accordance with the conditions set out in the approval of the activity.

Article 36 of the BBNJ Agreement provides that Parties shall periodically report on the impacts of the authorized activity and the results of the monitoring required under Article 35. Monitoring reports shall be made public, including through the Clearing-House Mechanism.

Article 37 of the BBNJ Agreement stipulates that Parties shall ensure that the impacts of the authorized activity monitored pursuant to Article 35 are reviewed. Should the Party with jurisdiction or control over the activity identify significant adverse impacts that either were not foreseen in the environmental impact assessment, in nature or severity, or that arise from a breach of any of the conditions set out in the approval of the activity, the Party shall review its decision authorizing the activity, notify the Conference of the Parties, other Parties and the public, including through the Clearing-House Mechanism. Furthermore, all States, in particular adjacent coastal States and any other States adjacent to the activity when they are potentially most affected States, and stakeholders shall be kept informed through the Clearing-House Mechanism and may be consulted in the monitoring, reporting and review processes in respect of an activity authorized under this Agreement. Parties shall publish reports on the review of the impacts of the authorized activity and other Decision documents, including through the Clearing-House Mechanism.

2.4 The function of the STB

Article 38 (1) of the BBNJ Agreement outlines a series of functions for the STB. It shall develop standards or guidelines for consideration and adoption by the COP on seven specific matters. These matters include the determination of whether the thresholds for the conduct of a screening or an environmental impact assessment under article 30 have been met or exceeded for

⁹ BBNJ Agreement, Articles 4.

¹⁰ BBNJ Agreement, Article 30.

planned activities, the assessment of cumulative impacts in ABNJ, the assessment of impacts, in areas within national jurisdiction (AWN), of planned activities in ABNJ, and the conduct of strategic environment assessment (SEA), among others.

Article 38 (2) of the BBNJ Agreement also provides that STB may develop standards and guidelines for consideration and adoption by the COP, including: (a) An indicative non-exhaustive list of activities that require or do not require EIA, as well as any criteria related to those activities; (b) The conduct of EIAs by Parties to this Agreement in areas identified as requiring protection or special attention.

Additionally, under the BBNJ Agreement, the STB may provide comments to the Party with jurisdiction or control over the planned activity upon receiving relevant information shared through the Clearing-House Mechanism during the Party's national procedures.¹¹

2.5 SEA

Article 39 of the BBNJ Agreement provides SEA. SEA is the application of EIAs at the policy, plan, and program levels, aimed at identifying potential environmental risks in advance, proposing preventive measures, and fostering harmony between economic development and environmental protection (Gallardo and Bond, 2023). It serves as an essential tool for achieving the sustainable development goals of the ocean and its resources. The BBNJ Agreement requires that Parties shall, individually or in cooperation with other Parties, consider conducting SEA for plans and programmes relating to activities under their jurisdiction or control, to be conducted in ABNJ. Additionally, the COP may conduct SEA for an area or region. To ensure the effective implementation of SEA, the COP shall develop guidance on the conduct of each category of SEA, providing institutional support for its successful execution.

Moreover, according to the BBNJ Agreement, SEA is designated as one of the objectives of the Agreement, and this goal will be supported by building and strengthening the capacity of Parties to conduct SEA.¹² Developing standards and guidelines for conducting SEA is also one of the functions of the STB.¹³

3 Implementation challenges of the provisions regarding EIAs under the BBNJ agreement

During the negotiation of the BBNJ Agreement, the issue of EIAs was one of the most discussed and controversial issues (Tiller et al., 2023). Although the Parties made every effort to reconcile their institutional disagreements regarding EIAs to facilitate the adoption of the Agreement as a comprehensive package, some contentious provisions related to EIAs were left blank or became

ambiguous. This approach allowed the Agreement to prioritize the establishment of general principles and foundational frameworks rather than getting bogged down in details. While this strategy helped expedite the adoption of the Agreement, it also resulted in unresolved issues regarding EIAs, leading to specific implementation challenges that have gradually emerged during the execution of the Agreement. If these challenges are not adequately addressed, they could undermine the effectiveness of the BBNJ Agreement in promoting the conservation and sustainable use of BBNJ (Tiller and Mendenhall, 2023).

3.1 Lacking specific provisions regarding the screening criteria and threshold

The BBNJ Agreement establishes that the criteria for screening planned activities are as follows: "When a planned activity may have more than a minor or transitory effect on the marine environment, or the effects of the activity are unknown or poorly understood."¹⁴ However, the phrases "minor or transitory" and "unknown or poorly understood" require further clarification during implementation (Li and Zhang, 2024; Zhang and Liu, 2024). Furthermore, the threshold for determining the necessity of EIAs is established by Article 206 of UNCLOS, which indicates that "the activity may cause substantial pollution of or significant and harmful changes to the marine environment in areas beyond national jurisdiction". However, the terms "substantial pollution" and "significant and harmful changes" lack specific definitions. While some international case law may provide guidance on interpreting and applying this threshold, it does not fully meet the requirements and is not legally binding on States (Song, 2022). EIAs for ABNJ cover a wide range of activities, including high seas shipping, fisheries, subsea cable laying, waste dumping, marine carbon sequestration, ocean fertilization, scientific research, and seabed mining. The various types and scales of these activities can have differing impacts on the marine environment. Therefore, it is crucial to clarify which activities may cause "more than a minor or transitory effect", which may have "unknown or poorly understood" effects, and which may lead to "substantial pollution of or significant and harmful changes to the marine environment" (Hassanali, 2023).

The screening criteria and threshold for EIAs in the BBNJ Agreement are overly vague and abstract. The previous draft of the Agreement included a specific list of activities, which has now been removed, further increasing ambiguity and uncertainty in decision-making. This lack of clarity not only complicates judgments but also raises the likelihood that different Parties will interpret and implement the Agreement in significantly different ways. Such discrepancies can undermine the consistency and effectiveness of EIAs implementation, potentially granting Parties excessive discretion in deciding whether or not to conduct EIAs. This poses a serious risk to the sustainable protection of the marine environment. Although the Agreement states that the STB has the

¹¹ BBNJ Agreement, Article 28(3).

¹² BBNJ Agreement, Article 27(4), 27(6).

¹³ BBNJ Agreement, Article 38(1).

¹⁴ BBNJ Agreement, Article 30.

right to develop an activity list in the follow-up process,¹⁵ this provision is not obligatory. Consequently, the STB subjects to various influences, such as political pressure or a lack of scientific consensus. This could hinder the drafting of the list or slow down its progress.

Furthermore, the BBNJ Agreement notably favors qualitative descriptions when establishing thresholds for EIAs, failing to provide specific and clear quantitative criteria.¹⁶ The vagueness of these qualitative standards, coupled with the absence of quantitative benchmarks, severely limits the effectiveness of EIAs in protecting the marine environment and promoting sustainable development. Therefore, it is essential to improve related standards and mechanisms to enhance the scientific, accurate, and practical aspects of EIAs. This, in turn, would lead to better protection of the marine environment and support the achievement of sustainable development goals.

3.2 Lacking specific provisions regarding cumulative impact assessment

Cumulative impact assessment (CEA) involves evaluating the spatial and temporal cumulative effects of environmental impacts. This assessment method reflects the fundamental principle of sustainable development, which seeks a balance between economic growth and environmental protection, rather than focusing solely on short-term profit maximization. CEA aims to thoroughly examine and assess the long-term effects of human activities on the natural environment. Cumulative impacts refer to changes in ecosystems that occur over time and can have significant consequences (De Lucia, 2024). Examples of such impacts include overfishing, pollution emissions, and other activities whose cumulative effects may lead to the collapse of marine ecosystems (Badrinarayana, 2025; Karamanli, 2023).

The BBNJ Agreement emphasizes the importance of CEA and provides a basic understanding of the concept.¹⁷ However, it does not specify which activities require CEA, the procedures to follow, or the technical methods to be employed. Instead, these details are left for the STB to develop and refine later on.¹⁸ Additionally, the implementation of CEA poses significant challenges due to the complexity of the pathways and effects of cumulative impacts, as well as the involvement of various disciplinary fields. This situation is particularly difficult for developing countries, which often face numerous technical hurdles. Many of these countries lack advanced research facilities, specialized assessment teams, and extensive practical experience, making it challenging for them to carry out high-quality CEA independently (Karamanli, 2023).

3.3 Monitoring and review mechanisms needing to be improved

The BBNJ Agreement includes provisions for monitoring mechanisms related to EIAs, but it lacks specific details in several areas. While it requires that approval conditions concerning mitigation measures and follow-up requirements be clearly outlined,¹⁹ it does not specify the methods, standards, or content of these decisions. This omission undermines the effectiveness of monitoring efforts. These vague guidelines on EIA might be interpreted differently by NGOs, coastal states, developing countries and other stakeholders. Similarly, regarding monitoring reports, the Agreement states that they must be made public through an information exchange mechanism, placing the responsibility for assessment on the STB.²⁰ However, the Agreement does not provide detailed guidance on the specific content that these monitoring reports should include. These gaps necessitate that the STB develop relevant standards and guidelines in the future. However, it remains uncertain whether these should take the form of binding standards or non-binding guidelines, and whether clear definitions can be established. Consequently, the STB faces numerous challenges in its work.

According to the BBNJ Agreement, the rights to screening, scoping, implementation, and decision-making regarding EIAs are reserved for the Parties involved.²¹ However, the jurisdiction or control over planned activities may grant States excessive discretion, potentially undermining the effectiveness of international supervision. Historical judicial practices have demonstrated that national activities lacking adequate supervision can cause significant harm to other nations. Given that activities in ABNJ have broader repercussions, they necessitate greater transparency and more effective supervision processes. To ensure consistency in the implementation of EIAs, it is crucial to establish an international supervision system. Thus, it is essential to internationalize the rules governing EIAs under the BBNJ Agreement, ensuring that the EIA process is subject to broader supervision and guidance (Li and Zhang, 2024).

The public participation mechanism aims to ensure transparency in the EIA process. The BBNJ Agreement stipulates that the Parties should ensure the timely participation of all States and stakeholders.²² It establishes a call-in mechanism that allows stakeholders to raise concerns with the Parties responsible for the jurisdiction or control of the activities. Additionally, the STB may consider, assess, and issue recommendations on these concerns (Hassanali, 2023). However, the Agreement does not specifically define how different stakeholders should engage in the EIAs, given that sovereign states and the general public have varying positions, perspectives, and methods of involvement. It also lacks specifics on how to ensure the participation of various stakeholders and how their substantive comments should be considered and addressed appropriately.

¹⁵ BBNJ Agreement, Article 38.

¹⁶ BBNJ Agreement, Article 28.

¹⁷ BBNJ Agreement, Article 1.

¹⁸ BBNJ Agreement, Article 38.

¹⁹ BBNJ Agreement, Article 34(3).

²⁰ BBNJ Agreement, Article 36(2).

²¹ BBNJ Agreement, Article 31.

²² BBNJ Agreement, Article 32.

3.4 The provisions regarding SEA needing to be improved

Article 1 of the BBNJ Agreement defines EIAs but does not provide a clear definition for SEA. Because the Parties have different ocean development strategies, levels of economic development, and varying expertise and practical experience with EIAs, their understanding and needs regarding SEAs differ significantly. This disparity is evident not only in their recognition of the necessity of SEAs but also in the specific implementation standards and assessment methods they employ. As a result, without a unified and clear definition of SEAs, the Parties are likely to face divergences and disputes when interpreting and implementing provisions regarding SEA.

Moreover, according to the BBNJ Agreement, the COP has the authority to conduct SEA²³ and develop guidance on the conduct of each category of SEA.²⁴ Besides, the standards or guidelines for SEA established by the STB are also subject to consideration and adoption by the COP.²⁵ While the BBNJ Agreement does not specify whether a State's plans or policies that do not align with the COP's SEA will be prohibited or impacted, the powers of the COP could potentially challenge the principle of national sovereignty under international law. It remains uncertain whether regional SEA initiated by the COP would have legal implications for SEA conducted independently or collaboratively by States. Moreover, the Agreement does not clearly mention or establish any coordination mechanisms to resolve potential conflicts that may arise from this situation. Furthermore, the conduct of regional SEA may set frameworks and impose operational constraints on each EIA, potentially imposing certain limitations on countries conducting EIAs within the region (De Lucia, 2024).

3.5 The regime of responsibility needing to be developed

The BBNJ Agreement emphasizes the obligation of Parties to conduct EIAs. However, if a Party fails to meet its obligations regarding EIAs and carries out activities in ABNJ that could harm the marine environment, the Agreement does not specify what effective measures should be taken to address the resulting environmental damage (Pickens et al., 2024). Furthermore, it does not outline how to accurately and fairly determine the responsibility of the Party involved.

The BBNJ Agreement emphasizes the principle of “polluter pays” within its section on “general principles and approaches”.²⁶ This principle can provide some guidance for the allocation of responsibility in EIAs. However, the Parties involved in negotiations related to the BBNJ Agreement have shown minimal willingness to compensate for environmental damage caused by violations of obligations regarding EIAs. Consequently, there are

still significant challenges in establishing a universally recognized regime of responsibility for EIAs based on the principle of “polluter pays”.

4 Implementation pathways for the provisions regarding EIAs under the BBNJ Agreement

Given the implementation challenges and the differing interests of various countries, it is crucial to prioritize the collective interests and needs of the international community by refining provisions of the Agreement rules, establishing cooperative mechanisms, and creating a framework for shared benefits. This approach will ensure global ecological protection and sustainable development while facilitating the effective implementation of provisions regarding EIAs under the BBNJ Agreement.

4.1 Specifying the screening criteria and thresholds

Establishing clear measurement criteria for the threshold of EIAs is a prerequisite for ensuring that countries effectively fulfill their obligations. Drawing from existing international documents and extensive judicial practices, it is important to refine and specify the measurement standards that should be used during the screening phase. This will provide practical and operational guidance for initiating EIA processes and help prevent countries from misusing their discretion.

4.1.1 Screening criteria and thresholds

When developing standards and guidelines, the STB should consider multiple factors to define the nature of a planned activity, including determining whether “it has more than a minor or transitory effect, or the effects of the activity are unknown or poorly understood,” and whether “it causes substantial pollution or significant and harmful changes.” Activities can be categorized by type and scale, which allows for the development of specific screening requirements and criteria for each category. When detailing each category, the following aspects should be considered:

- The scale of the planned activity. Consider the size of the activity, the methods of implementation, and the potential technical measures involved.
- Timing of the planned activity. Examine whether the activity occurs during sensitive periods, such as fish spawning seasons or other critical ecological moments.
- Geographical location. Determine if the activity is situated in ecologically sensitive areas, biodiversity conservation zones, or regions with significant ecological functions.

Factors such as cumulative impacts, reversibility, and the feasibility of alternatives should also be assessed to ensure the comprehensiveness and accuracy of the assessment. By refining

23 BBNJ Agreement, Article 39(2).

24 BBNJ Agreement, Article 39(4).

25 BBNJ Agreement, Article 38(1)(7).

26 BBNJ Agreement, Article 7.

the criteria and thresholds for screening, clearer guidance can be provided for initiating the EIA process. Additionally, it is essential to draw on the experience of mechanisms such as the Espoo Convention and the Antarctic Treaty System, which have more specific thresholds and protection procedures, thereby offering valuable lessons for the BBNJ framework.

4.1.2 List of activities regarding EIAs

For developing countries with relatively underdeveloped marine technology, the lack of knowledge regarding marine protected areas and limited research capabilities often makes it challenging to identify activities that require EIAs (Jiang and Guo, 2023). Therefore, it is crucial to establish a clear list of activities that necessitate EIAs. This list will help these countries identify EIA-related projects and enhance the efficiency of the assessment process. Both the Convention on Biological Diversity and the Espoo Convention explicitly define a list of activities related to EIAs, which serves as an important foundation for determining which projects require these assessments. The STB should acknowledge the significance of this list and work swiftly to develop a non-exhaustive indicative list of activities that do or do not require EIAs. This would help clarify the standards for EIAs under the BBNJ Agreement (Tang, 2024). In creating this list, the STB should draw from international conventions like the Convention on Biological Diversity and the Espoo Convention, consider the views of various countries, involve scientific experts for evaluation, and take into account public feedback to reach a scientific consensus.

Furthermore, when outlining the screening criteria and thresholds or compiling the list, it is essential to rely on qualitative descriptions while incorporating quantitative data whenever possible. This approach will enhance the detail and specificity of the criteria. For instance, measurable standards can be established for the depth of marine activities, the volume of associated emissions, and the capacity of facilities. This will help improve the accuracy of the standards.

4.2 Refining the provisions for CEA

In order to promote the effective implementation of CEA globally, the international community needs to strengthen cooperation and communication, continuously enhance interdisciplinary research and technological innovation, and jointly study and refine the theoretical framework and technical methods of CEA.

4.2.1 Dedicated technical working group

Given the high technical requirements for conducting CEA on human activities in ABNJ and considering that research and practice in this field are still in the early stages, there is a significant need to promote the development of foundational infrastructure and research for CEA. To address this need, the STB could establish a dedicated technical working group comprised of experts from various fields and disciplines. This group would

conduct in-depth research on subsequent CEA-related designs, enhance specific rules for CEA, and provide scientific support for environmental protection and sustainable development in ABNJ (Qian et al., 2024).

The working group should prioritize clarifying the objects of CEA as soon as possible and develop corresponding thresholds for initiating CEA along with comprehensive activity lists. This process should be similar to determining the objectives of EIAs. This process should consider the specific environmental conditions of each region, as well as the nature, scale, and impacts of the planned activities. However, it is important to emphasize that CEA focuses more on the long-term cumulative effects of these planned activities. For factors whose impacts arise from the synergistic or cumulative effects of multiple elements, relevant research and design should also be conducted. Additionally, the group should explore CEA methods and technologies that are applicable to ABNJ, while also designing, innovating, and optimizing key processes such as data collection, processing, analysis, and assessment. The group needs to develop scientifically sound evaluation procedures and indicator systems. Furthermore, given the long-term nature of CEA, the evaluation mechanism should be continuously refined. Case studies can be conducted to assess the feasibility and effectiveness of evaluations, helping to identify and improve any issues while providing valuable experience and demonstrations for future practical applications.

4.2.2 Legal obligation of international cooperation

Since ABNJ covers two-thirds of the world's oceans (Caldeira et al., 2023) and the cumulative impact of planned activities has transboundary characteristics, effective implementation of SEA requires continuous cooperation among countries or international organizations. This collaboration is essential for establishing closer working relationships (Li and Zhang, 2024). Scientific research and technological advancements encourage countries to meet their obligations (Qian et al., 2024). Consequently, all Parties can work together on the development and innovation of SEA technologies. This can be achieved through joint research projects, the sharing of the latest scientific findings, and the promotion of technological innovation and transfer. Such collaboration will facilitate efficient global knowledge sharing and provide valuable insights for designing provisions regarding CEA under the BBNJ Agreement. Meanwhile, cooperating Parties can jointly undertake SEA projects, conduct thorough research on specific regions or issues, and enhance scientific and effective planning by sharing data, experiences, and best practices. This collaborative approach can significantly reduce the economic and time costs associated with repeated assessments.

Moreover, it is important to consider the unique needs of developing countries (García-Carriazo, 2023), particularly those that are the least developed countries, landlocked developing countries, geographically disadvantaged States, small island developing States, coastal African States, archipelagic States and developing middle-income countries.²⁷ Developing countries should actively pursue external support and collaboration. A

dedicated technical working group, along with developed countries, can offer comprehensive assistance through technical aid, capacity building, financial contributions, and other resources. This support will help ensure the effective implementation of SEA, enhance the CEA technologies of developing countries, and enable them to meet the CEA requirements under the BBNJ Agreement.

4.3 Improving monitoring and review mechanisms

The blanks and issues related to the monitoring and review mechanisms of EIAs in the BBNJ Agreement need to be addressed through joint efforts by the international community. This can be achieved by developing detailed standards and guidelines, strengthening the international oversight system, enhancing transparency and supervision processes, and improving public participation mechanisms.

4.3.1 Monitoring content

The STB should engage in thorough planning with a scientific and rigorous approach to efficiently and comprehensively determine the specific contents of each document in the shortest possible time. This will facilitate the smooth progress of subsequent reviews and supervision. If necessary, relevant on-site monitoring activities should be specified during implementation. These activities, aligned with the content of the EIA reports, can oversee all stages of the EIA process. This includes tracking the implementation of existing activity plans and assessing the effectiveness of measures for pollution control and ecological protection. Supervision of EIAs must encompass all stages of the process. However, to ensure efficiency and cost savings, representative or indicative indicators can be selected for monitoring at each phase. These standards do not need to be uniform for all types of activities in ABNJ. A more effective approach would be to establish specific standards based on the knowledge required, the nature of the planned activities, and their potential impacts. For instance, the information needed to assess the impact of marine cleanup differs from that required to evaluate deep-sea seabed mining.

Moreover, strengthening the authorization and scientific support for the STB will further enhance its effectiveness and authority within the framework of the BBNJ Agreement (Mendenhall and Helm, 2024). Specifically, the COP could consider clearly defining the STB's authority to develop specific standards in key aspects, promoting the clarification and standardization of regulatory content. At the same time, it is essential to strengthen the oversight of STB.

4.3.2 Public participation mechanism

To ensure broad public participation, diversified mechanisms should be employed (Hassanali, 2023). After Parties issue public notification documents concerning EIAs or request public consultation via the Clearing-House Mechanism, the STB should provide various channels for disclosure and collection of comments.

National and regional institutions can utilize diplomatic channels, while Indigenous peoples, communities, and the public can engage through media outlets such as newspapers, television, radio, and the Internet (Verdon, 2024; McLean et al., 2023). When issuing notifications, Parties and the STB should take into account the comprehension levels of Indigenous peoples and local communities. They may opt to hold public hearings or allow representatives to convey their opinions. Given the diverse range of stakeholders affected by activities in ABNJ, it is not feasible for every participant to be fully engaged in the EIA process. Therefore, national, global, regional, sub-regional, and sectoral institutions, along with academia and scientific experts, should be permitted to express their opinions and provide feedback at any stage of the EIA process (Kaijie and Jin, 2023). Additionally, the Clearing-House Mechanism under the BBNJ Agreement could be enhanced using the Internet or other platforms to improve efficiency.

There is a need to establish an effective feedback mechanism that ensures the public's comments and suggestions are taken seriously and receive a response. Specifically, for concerns raised through the call-in mechanism and the recommendations made by the STB based on those concerns, the Parties should have a clear obligation to respond. This approach will encourage more active participation from the public.

4.4 Improving provisions concerning SEA

With global environmental change and increasing resource exploitation, ecosystems in ABNJ are facing unprecedented pressure. Regional SEA is a key mechanism for ensuring the comprehensive ecosystem-based protection of BBNJ. To effectively address these challenges, provisions concerning SEA need to be further improved. By establishing a more scientific and systematic assessment mechanism, the sustainability of marine development activities can be ensured, and cooperation among countries in marine resource management and environmental protection can be promoted (Hassanali and Mahon, 2022).

4.4.1 Definition of SEA

The international community should work towards a unified understanding of SEA based on the growing body of marine governance experience. This involves addressing the ongoing exploitation of resources in international public or disputed maritime areas and using SEA to enhance global and regional cooperation in marine resource development as well as marine ecological protection. When defining SEA under the BBNJ Agreement, it is important to consider its specific decision-making processes and areas of focus (Carter and Henríquez, 2022). Definitions and regulations from regions with more established SEA practices, such as the European Union, can serve as useful references.

4.4.2 National leadership and cooperation obligations

It is important to clarify that the implementation of SEA under the BBNJ Agreement should be led by national decision-making.

27 BBNJ Agreement, Article 30.

This approach preserves national leadership and authority in SEA processes. Future amendments or supplementary agreements to the BBNJ Agreement must clearly define the legal status of COP-led SEA and outline its specific implications for national governments' decision-making. This clarification should include, but not be limited to, specifying the non-binding nature of SEA results on national policies, plans, or programs. It should also detail the circumstances under which the COP can offer recommendations or coordination without directly interfering in decisions that fall under national sovereignty. Additionally, regional SEA should provide flexible frameworks and operational guidelines for countries conducting EIAs. This flexibility allows nations to make necessary adjustments based on their unique environmental, economic, and social conditions, while always maintaining the autonomy of their final decision-making.

Furthermore, regional SEA typically involves multiple countries and requires specialized technical expertise, so merely encouraging cooperation is not enough. There should be clear obligations for SEA cooperation among the involved Parties. These obligations should include requirements for information exchange, timely notifications, consultations, and emergency procedures. Countries need to align their understanding of regional issues, share resources and experiences, and collectively evaluate assessment criteria (Zhou and Sheate, 2011). Additionally, they should strengthen technical cooperation and knowledge sharing while collaborating on conducting SEA. This will enhance the coordination of EIAs within the region and help avoid conflicts between regional SEA carried out by States (Li and Xing, 2024).

4.5 Establishing a sound regime of responsibility

Establishing a clear regime of responsibility is a crucial guarantee for ensuring that EIAs are effectively implemented and serve their intended purpose. By clarifying the subject and content of responsibility and providing relief means, it can not only effectively regulate the actions of the Parties involved but also ensure that the environment receives timely remedies and restoration when needed.

4.5.1 Identification and imputation of responsibilities

Article 235 of UNCLOS is a key provision concerning marine environmental responsibility and can serve as a foundational element for the responsibility framework of EIAs under the BBNJ Agreement. In addressing EIAs, the Parties should adhere to the provisions of Article 235 of UNCLOS to establish a clear allocation of responsibilities. Furthermore, it is important to use ITLOS disputes and recommend COP-guided peer review mechanisms. At last, EIAs function as a preventive mechanism, differing from the strict liability typically associated with general international environmental law. They do not impose excessive burdens during the development process. If liability for failing to meet EIA obligations is combined with liability for causing damage to the

marine environment, it could provoke resistance from the Parties involved. Thus, the principles governing the imputation of responsibilities for EIAs under the BBNJ Agreement should be clearly and reasonably defined.

4.5.2 Responsibility and compensation fund

ABNJ, representing the shared marine interests of humanity, calls for the international community to take collective action in environmental protection. It emphasizes the need for a fair distribution of responsibilities, rather than placing the obligations solely on individual countries (Li and Xing, 2024). To address the potential damage that planned activities may cause to ABNJ, one proposal from the BBNJ Agreement negotiations is to establish a responsibility and compensation fund. This fund is intended to provide prompt relief, remediation, and restoration measures in the event of environmental damage caused by marine activities (Hassanali, 2023). By utilizing pre-collected funds, this approach could effectively mitigate long-term negative impacts on marine ecosystems and those who depend on them.

It is worth noting that the BBNJ Agreement does not explicitly prohibit the COP from establishing a responsibility and compensation mechanism that could be suitable for the future BBNJ regime. The Agreement also allows the COP to consider the creation of additional funds.²⁸ Thus, the COP has the flexibility to establish an additional fund within the financial mechanism (Hassanali, 2023). This fund could provide timely financial support for the damaged marine environment and encourage the international community to collectively take responsibility for marine conservation. Furthermore, to enhance the appeal and sustainability of the fund, the COP could also explore diversified funding sources, such as international aid, private sector contributions, and funds generated through green financial instruments. This approach would help increase the capacity of the fund to address marine environmental damage effectively.

5 Conclusions

After 19 years of preparation and negotiations, the BBNJ Agreement was finally adopted, with the provisions regarding EIAs being a crucial component. However, to expedite the adoption process, some controversial mechanisms within these provisions were either obscured or left unaddressed. This not only hampers the future effective implementation of the provisions but also complicates the achievement of the objectives of the BBNJ Agreement.

This paper provides a detailed explanation of the core provisions regarding EIAs in the BBNJ Agreement. It thoroughly analyzes the challenges encountered during the implementation of these provisions, identifying five major issues, including unclear screening criteria and thresholds, the absence of specific guidelines for CEA, the need for improvement in monitoring and review

²⁸ BBNJ Agreement, Article 52.

mechanisms, deficiencies in the provisions regarding SEA and the necessity for establishing a regime of responsibility. Then the paper explores potential pathways for implementation, including specifying the screening criteria and thresholds, refining the provisions for CEA, improving monitoring and review mechanisms, improving provisions concerning SEA and establishing a clear regime of responsibility.

Although this paper provides a comprehensive overview of the core provisions, implementation challenges, and implementation paths of the provisions regarding EIAs under the BBNJ Agreement, some shortcomings remain. The paper does not offer an in-depth exploration of the specific interpretation and application of certain ambiguous provisions in the Agreement. As the Agreement is gradually implemented, these provisions will require further research and clarification. Additionally, as global marine environments continue to evolve and international cooperation deepens, provisions regarding EIAs under the BBNJ Agreement need to be continuously updated and refined to adapt to new circumstances and challenges. Therefore, future research should focus on the latest developments and trends in the provisions regarding EIAs under the BBNJ Agreement.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

Author contributions

CW: Conceptualization, Writing – review & editing, Writing – original draft. YL: Writing – original draft.

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