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The Impact of the BBNJ agreement's EIA provisions on China: a comprehensive analysis under the SWOT-PEST framework

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The Environmental Impact Assessment (EIA) provisions form a crucial part of 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 (the BBNJ Agreement) and are expected to have significant implications for States Parties. From a Chinese perspective, this study applies the SWOT-PEST analytical framework to examine the potential impacts of the BBNJ EIA rules on China. The findings reveal both opportunities and challenges across four dimensions: political, economic, social, and technological. Politically, China possesses certain policy and legal foundations, yet these are not fully developed, and while its international discourse power may expand, new regulatory barriers may arise. Economically, the healthy development of the marine economy supports the implementation of the new rules, however, in the short term, enterprises face multiple pressures such as rising costs and delayed returns, intensifying resource competition, while in the long run, this may facilitate their transformation and upgrading. Socially, despite existing gaps relative to international benchmarks, the engagement of diverse stakeholders provides a foundational basis for rule implementation, and although rising social pressures and adaptation costs present challenges, this also creates opportunities for multi-stakeholder development. Technologically, advancements in deep-sea technologies provide critical support for rule implementation while core technologies remain bottlenecked, facing threats from external technological barriers and simultaneously offering opportunities for cultivating marine technology expertise. Based on this analysis, the paper proposes potential strategies, including active participation in global ocean governance, advancement of deep-sea technologies, promotion of corporate transformation, and improvement of domestic legal frameworks.

KEYWORDS

BBNJ agreement, environmental impact assessment provisions, impact, response strategies, SWOT-PEST

1 Introduction

On June 19, 2023, during an intergovernmental conference convened under the auspices of the United Nations, the BBNJ Agreement was formally adopted. As the third implementing agreement under the United Nations Convention on the Law of the Sea (UNCLOS), the BBNJ Agreement represents a legally binding international instrument dedicated to the conservation and sustainable use of marine biodiversity in ABNJ (Carro Pitarch, 2023). The agreement aims to establish a unified global legal framework addressing key issues such as the utilization of marine genetic resources, the protection and management of marine ecosystems, EIAs, and capacity-building efforts. The adoption of the BBNJ Agreement is regarded as one of the most significant legislative developments in contemporary ocean law and international law. It is expected to reshape the global distribution of maritime interests and play a crucial role in shaping the future international ocean governance order.

The BBNJ Agreement consists of twelve parts and two annexes, with a primary focus on four key areas: Marine genetic resources, including the fair and equitable sharing of benefits; Measures such as area-based management tools, including marine protected areas; EIAs; and Capacity-building and the transfer of marine technology. These key areas reflect a comprehensive approach to the protection of marine biodiversity at multiple levels. During the formulation and adoption of the BBNJ Agreement, a significant body of research has emerged. These studies encompass both broad analyses of the agreement as a whole—such as the principles (Su, 2021) and approaches (Wagenaar, 2022) that should be emphasized, revisions made during negotiations (Roach, 2021) and its relationship to climate change (Wang and Wu, 2025)—as well as research focused on specific issues within the agreement, including the fair and equitable sharing of benefits from marine genetic resources (Toledo and Bizawu, 2020; Xu and Jin, 2025), area-based management tools (Duan, 2024; Klerk, 2025), EIAs (Tanaka, 2024; Becker-Weinberg, 2023), capacity-building, and the transfer of marine technology (Minas, 2018; Harden-Davies et al., 2024). With regard to EIAs, current research—particularly following the adoption of the BBNJ Agreement—remains relatively limited in analyzing the implications of its EIA provisions for China. However, this is a critical issue that warrants careful examination and consideration.

This paper employs the SWOT-PEST analytical framework to examine the impact of the EIA provisions under the BBNJ Agreement on China, as well as China's response strategies. Part II introduces the core content of the EIA provisions, providing an overview of their background and key negotiation debates, and compares these rules with those established under UNCLOS, highlighting their similarities and differences. Part III conducts a comprehensive assessment of their impact on China using the SWOT-PEST framework, analyzing strengths, weaknesses, opportunities, and threats, alongside political, economic, social, and technological dimensions. Part IV explores China's potential response strategies to address the challenges and seize the opportunities presented by these provisions. Finally, Part V summarizes the key findings.

2 EIA rules in ABNJ

2.1 Background and debates on the formulation of BBNJ EIA rules

The EIA system originated from the United States' 1969 National Environmental Policy Act (NEPA) (Salzman and Thompson, 2016). As a preventive environmental protection mechanism, the EIA system has gained widespread attention and application, with more than 100 countries establishing domestic EIA regulations. As transboundary environmental pollution has intensified, the application of EIA has expanded beyond domestic projects to include transboundary initiatives and has been recognized in numerous international treaties and agreements. For instance, the Convention on Environmental Impact Assessment in a Transboundary Context (1991) was the first international convention centered on EIA, aiming to prevent and mitigate significant transboundary environmental harm through intergovernmental cooperation.¹ Similarly, the Convention on Biological Diversity (1992) mandates that contracting parties, where appropriate, implement procedures to assess projects that may have significant adverse impacts on biodiversity.² In the realm of marine environmental protection, the UNCLOS also establishes EIA obligations, forming a key legal foundation for the incorporation of EIA rules within the BBNJ Agreement³.

The signing of an international treaty or agreement typically requires multiple rounds of negotiations to reach a consensus. The negotiation process for the BBNJ Agreement lasted nearly two decades, involving a diverse range of stakeholders with competing interests, resulting in a complex web of positions and perspectives (Basiak et al., 2017). Due to the influence of sovereignty-related issues in the formulation of EIA rules (Liu and Hu, 2017), negotiations over these provisions were subject to significant disputes.

These disputes primarily revolved around four key issues. First, the relationship between the BBNJ EIA provisions and existing legal instruments, frameworks, and bodies (IFBs). The challenge in constructing new EIA rules lay in balancing the interests of diverse stakeholders, ensuring compatibility between emerging principles of international law and existing regulatory frameworks, and establishing a legally binding framework for the BBNJ EIA mechanism. These issues were among the most contentious points in the legislative process (Jiang and Zhang, 2021). To address these concerns, the United Nations General Assembly (UNGA) adopted Resolutions 69/292 and 72/249, establishing the “not undermine”, which stipulates that the BBNJ Agreement “should not undermine existing relevant legal instruments and frameworks, nor the effectiveness of relevant global, regional, and sectoral bodies.” As negotiations progressed, the “not undermine” became a focal point of debate.

1 The Convention on Environmental Impact Assessment in a Transboundary Context, Article 2

2 The Convention on Biological Diversity (CBD), Article 14

3 The UNCLOS, Article 206

Second, the threshold for triggering an EIA under the BBNJ Agreement. Most international agreements set the threshold for initiating an EIA at “significant impact” or “serious harm,” though some adopt a lower threshold. For instance, the UNCLOS requires an EIA if an activity is likely to cause “significant pollution or substantial and harmful changes” to the marine environment.⁴ Meanwhile, in Antarctica, stricter environmental conditions necessitate a lower EIA threshold.⁵ Throughout negotiations, stakeholders failed to reach a unanimous agreement on the appropriate threshold for the BBNJ EIA.

Third, the degree of internationalization in the BBNJ EIA process. Internationalization typically pertains to evaluation procedures and standards, including consultation, information sharing, review, and decision-making (Jiang and Chen, 2021). In the BBNJ EIA negotiations, stakeholders diverged into two camps (Li and Zhang, 2024): developed countries, possessing technological and economic advantages, sought to limit the internationalization of EIAs, advocating for state-led processes and stricter thresholds that would reduce the number of assessments required. In contrast, developing countries and small island states pushed for greater international oversight, favoring a globally unified set of EIA standards.

Fourth, the role of strategic environmental assessment (SEA). SEA is a systematic and comprehensive assessment of the environmental impacts of strategic decisions and policy alternatives, serving as a tool for integrating environmental protection and sustainable development into decision-making (Shi and Chen, 2020). While most countries supported including SEA in the BBNJ Agreement, there was considerable disagreement over how it should be structured within the treaty.

Beyond these major debates, further disputes arose over specific regulatory details, such as monitoring procedures and reporting requirements within the EIA framework. Against the backdrop of these complex negotiations and competing interests, the EIA provisions of the BBNJ Agreement took shape. To accurately grasp and interpret the BBNJ EIA system, it is essential to systematically examine and introduce its core content.

2.2 Core provisions of EIA rules in the BBNJ agreement

2.2.1 Clarification of EIA objectives and establishment of contracting parties' obligations

In terms of objectives, the EIA provisions in the BBNJ Agreement establish six key objectives: (1) implementing UNCLOS requirements for EIA in ABNJ; (2) ensuring effective assessments to prevent, mitigate, and manage adverse impacts, thereby protecting the marine environment; (3) considering cumulative impacts and those within national jurisdiction; (4) incorporating SEA; (5) creating a harmonized EIA framework for

ABNJ activities; and (6) promoting capacity-building for EIA and SEA implementation.⁶ Its fundamental objective is to establish a unified legal framework to regulate EIA for activities in ABNJ before they take place. Additionally, recognizing the economic and technological disparities among contracting parties and to support the Agreement's goals, provisions are included to enhance capacity-building, particularly for developing countries, including least developed countries (LDCs), landlocked developing countries (LLDCs), geographically disadvantaged states, small island developing states (SIDS), African coastal nations, archipelagic states, and middle-income developing countries.

The BBNJ Agreement requires contracting parties to assess the potential environmental impact of activities planned in ABNJ under their jurisdiction or control before granting authorization.⁷ If an activity is expected to cause “significant pollution or significant and harmful changes” to the marine environment, an EIA must be conducted. The Agreement provides two options for conducting an EIA:

1. Following the EIA procedures outlined in the Agreement.
2. Conducting the EIA in accordance with the contracting party's national procedures.

If a national procedure is used, the contracting party must meet three key obligations: (a) Provide relevant information in a timely manner through an information-sharing mechanism. (b) Monitor the activity in accordance with national procedures. (c) Submit both the EIA report and the monitoring report via the information-sharing mechanism.

Additionally, upon receiving the submitted information, the scientific and technical body established under the Agreement may review and provide comments on the assessment.

2.2.2 Clarifying the relationship between the agreement and IFBs in EIA

Ensuring that the autonomy of existing IFBs is not compromised is a challenging task (Kim, 2024). Article 29 of the Agreement addresses potential conflicts between the new and existing EIA rules.

First, the Agreement requires that contracting parties promote the application of EIA standards or guidelines developed under this Agreement by the relevant IFBs for their members. Furthermore, when developing or updating these standards or guidelines, the scientific and technical body should, as appropriate, cooperate with the relevant IFBs.

Second, the Agreement mandates the establishment of a mechanism by the Conference of the Parties to promote collaboration between the scientific and technical body and IFBs that govern ABNJ activities or marine environmental protection.

Third, the Agreement clarifies situations where screening and EIAs are not required:

⁴ The UNCLOS, Article 206

⁵ The Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol), Article 3

⁶ The BBNJ Agreement, Article 27

⁷ The BBNJ Agreement, Article 28

1. If an EIA has already been conducted in accordance with the relevant legal instruments, frameworks, or institutions.
2. If the evaluation of an activity already conducted is equivalent to the assessment required under this Agreement, and the evaluation results have been considered, or the threshold for triggering an EIA established by the relevant legal instruments, frameworks, or institutions is lower than that of this Agreement, and has already been implemented.

Lastly, the Agreement establishes obligations for contracting parties to disclose:

1. In cases where an EIA has already been conducted according to other regulations or institutional requirements, the contracting parties must disclose the EIA report through the information exchange mechanism.
2. In cases other than the first situation where no EIA is required, the contracting parties must monitor and review the planned activity and disclose the monitoring and review reports via the information exchange mechanism.

2.2.3 Establishing detailed EIA procedures

The EIA rules of the BBNJ Agreement divide the EIA process into six distinct stages, specifically: screening, scoping, impact assessment and evaluation, consideration of alternatives, public notification and consultation, and the preparation and publication of the EIA report.

1. Screening.

Unlike UNCLOS, which provides only a general requirement to conduct an EIA, the BBNJ Agreement establishes more detailed and explicit criteria for triggering EIAs in ABNJ. Under UNCLOS, states determine whether to conduct EIA based on “reasonable grounds,” without a clear definition of what constitutes “reasonable grounds.” In contrast, the BBNJ introduces a screening procedure that specifies the steps to determine whether an EIA is necessary and requires that the resulting decisions, recommendations, and opinions be made public. Essentially, the screening procedure refines UNCLOS “reasonable grounds” requirement while reducing states’ discretionary power in EIA decisions. At the same time, the BBNJ retains UNCLOS’s core threshold—activities that “may cause substantial pollution or significant and harmful changes to the marine environment”—but refines it by listing concrete factors to reduce ambiguity.

2. Scoping.

The Agreement clarifies the scope of environmental impacts to be evaluated in the EIA, including the identification of key environmental concerns and any relevant impacts, such as economic, social, cultural, and human health impacts. This also includes potential cumulative impacts and impacts on areas under national jurisdiction, as well as alternatives to the planned activities (if any). The scope should be determined through the use of the best available scientific data and information, and where possible, traditional knowledge from indigenous peoples and local communities.

3. Impact Assessment and Evaluation.

Particular emphasis is placed on the inclusion of cumulative impacts and the impacts on areas within national jurisdiction in the EIA.

4. Prevention, Mitigation, and Management of Potential Adverse Impacts.

Parties are required to identify measures for preventing, mitigating, and managing adverse impacts, including alternatives to the planned activities. These measures should be incorporated into the environmental management plan as appropriate.

5. Public Notification and Consultation.

This article⁸ first requires Parties to timely announce their planned activities through relevant channels and ensure broad participation, particularly from adjacent coastal states and any other countries that may be affected by the activity. These countries may be the most severely impacted and are considered key stakeholders in the EIA process. The article further defines the criteria for determining which countries are likely to be most affected and identifies the range of stakeholders involved. Specific attention is given to small island developing states. It also stipulates that Parties must address substantial comments in a timely manner and ensures the protection of confidential information. Special provisions are included for cases where a planned activity affects areas of the high seas entirely surrounded by an exclusive economic zone.

6. Preparation and Publication of the EIA Report.

Article 33 first establishes the obligation of Parties to prepare an EIA report. It also provides detailed regulations regarding the content of the report and the procedures for its publication. Additionally, the roles and responsibilities of scientific and technical institutions in the publication of the EIA report are outlined, including their obligations in terms of review and feedback.

These six stages form a comprehensive framework for conducting thorough environmental assessments of activities in ABNJ, ensuring that the potential impacts on marine ecosystems are carefully evaluated and addressed before any activity is authorized.

2.2.4 Obligations of parties and scientific and technical institutions after the EIA

After conducting the EIA in accordance with the Agreement, the Party responsible for the planned activity must comply with the following requirements:

1. Determine the Feasibility of the Activity: The Party must determine whether the activity is feasible based on the results of the EIA and must make the decision document available through the information exchange mechanism or other means of publication.⁹
2. Monitor the Impact of the Authorized Activity: The Party must continuously monitor the impacts of any activity it authorizes

⁸ The BBNJ Agreement, Article 32

⁹ The BBNJ Agreement, Article 34

or conducts in ABNJ to assess whether such activities might cause adverse effects on the marine environment.¹⁰

3. Report the Impact of the Authorized Activity: The Party is required to regularly report on the impacts of the authorized activity as well as the results of the monitoring efforts.¹¹
4. Review the Authorized Activity and Its Impacts: The Party must ensure that the impacts of the authorized activity under monitoring are reviewed.¹² Additionally, the Party must register its concerns, taking into account the best available scientific information and, where possible, indigenous peoples' and local communities' traditional knowledge.¹³ The Party must also promptly publish the review documents and decision documents, among others.¹⁴

Scientific and technical bodies may consider and assess the monitoring reports¹⁵, and if they believe that significant adverse impacts not foreseen in the EIA may occur, or if significant adverse impacts result from a violation of any conditions attached to the authorized activity, they may notify the Party and offer recommendations¹⁶. After a Party registers its concerns, if the scientific and technical body considers similar issues might arise, it will provide recommendations after hearing the Party's response¹⁷. Finally, the scientific and technical bodies are also responsible for developing relevant standards or guidelines¹⁸.

2.2.5 Promoting effective participation while balancing the interests of multiple parties

The area beyond national jurisdiction refers to the "high seas" and the "Area." The "high seas" are the waters that do not include a nation's exclusive economic zone, territorial sea, internal waters, or the waters surrounding island nations¹⁹, and are not subject to the sovereignty of any state²⁰. The freedom of the high seas principle applies here²¹. The "Area" refers to the seabed, ocean floor, and subsoil beyond national jurisdiction²², and its resources are the common heritage of mankind (CHH)²³. Thus, the area beyond national jurisdiction should be shared by all humanity, and the CHH principle is the essence of the BBNJ Agreement (Chang et al., 2024). Signing the BBNJ Agreement means that countries are bound

by it when conducting activities in ABNJ, with different countries having diverse economic conditions, technical capabilities, and geographical positions. To ensure the effective implementation of the agreement, the BBNJ Agreement balances the interests and requirements of multiple parties. "Fully acknowledging the special circumstances of small island developing states and least developed countries" and "acknowledging the special interests and needs of landlocked developing countries" are general principles and approaches of the agreement²⁴.

Specifically, in the area of EIA, the agreement first establishes as its objective the development and strengthening of the capacity of parties to prepare, conduct, and evaluate EIAs and SEAs, especially for developing countries, including the least developed countries, landlocked developing countries, geographically disadvantaged countries, small island developing states, coastal African countries, archipelagic states, and middle-income developing countries, to support the achievement of the agreement's goals.²⁵

Secondly, in the procedural regulations for EIA, to enable small island states to conduct BBNJ EIAs, the agreement allows for joint EIAs and establishes expert rosters within scientific and technical institutions to assist parties with limited capacities²⁶.

Thirdly, regarding the announcement provisions, the agreement ensures that the countries and stakeholders most likely to be affected are included in the process and that their substantive comments are responded to or addressed during consultations. If small island developing states are involved, targeted and proactive measures are required²⁷.

Furthermore, if an activity affects the high seas entirely enclosed by a nation's exclusive economic zone, the agreement mandates that the relevant surrounding countries should lead the consultation process, consider their views and comments, and provide a written response.²⁸

Finally, in the monitoring, reporting, and review procedures for authorized activities, parties are required to keep all nations informed and engage in consultations with them as needed.²⁹

2.2.6 Inclusion of SEA

SEA is incorporated into the agreement and is explicitly outlined in Article 39. SEA is an evaluation of relevant plans and programs related to activities in ABNJ, aimed at assessing the impacts of the plan or program, as well as alternative options, on the marine environment. Parties are required to consider the results of the strategic environmental assessments. The Conference of the Parties may undertake a strategic environmental assessment for a particular region or area to comprehensively assess the condition of that region. Additionally, the Conference of the Parties should develop guidelines for the implementation of each type of strategic environmental assessment.

10 The BBNJ Agreement, Article 35

11 The BBNJ Agreement, Article 36(1)

12 The BBNJ Agreement, Article 37(1)

13 The BBNJ Agreement, Article 37(4)

14 The BBNJ Agreement, Article 37(6)

15 The BBNJ Agreement, Article 36(2)

16 The BBNJ Agreement, Article 37(3)

17 The BBNJ Agreement, Article 37(4)

18 The BBNJ Agreement, Article 38

19 The UNCLOS, Article 86

20 The UNCLOS, Article 89

21 The UNCLOS, Article 87

22 The UNCLOS, Article 1

23 The UNCLOS, Article 136

24 The BBNJ Agreement, Article 7

25 The BBNJ Agreement, Article 27(6)

26 The BBNJ Agreement, Article 31(2)

27 The BBNJ Agreement, Article 32(4)

28 The BBNJ Agreement, Article 32(6)

29 The BBNJ Agreement, Article 37(5)

2.3 Core rules of BBNJ EIA and their similarities and differences with UNCLOS

As an implementing agreement under the UNCLOS, the BBNJ Agreement necessitates a comparison of their EIA provisions. Overall, both instruments share similarities and exhibit distinct differences. In terms of similarities, both establish the fundamental legal obligation to conduct EIAs, with the BBNJ Agreement serving as a concrete elaboration of the general principle set out in Article 206 of UNCLOS. They also share the same overarching objective: to protect and preserve the marine environment and prevent significant pollution or harmful changes to marine ecosystems caused by human activities. However, several notable differences exist. First, their scope of application differs: UNCLOS applies broadly to all maritime zones, including areas under national jurisdiction and the high seas, while the BBNJ Agreement specifically governs activities in ABNJ. Second, the completeness of procedural requirements varies: UNCLOS Article 206 merely stipulates that an assessment should be conducted where there is a reasonable ground of potential significant harm, without detailed procedures; in contrast, the BBNJ Agreement establishes a comprehensive, transparent, and operational process, explicitly covering all stages from initial screening to post-activity monitoring. Third, public participation and information disclosure diverge: UNCLOS only provides a general requirement to publish assessment results, whereas the BBNJ Agreement clearly mandates stakeholder participation and consultation throughout the process. Finally, international oversight mechanisms differ: under UNCLOS, EIAs are primarily implemented by states with limited international supervision, while the BBNJ Agreement introduces stronger international oversight and reporting mechanisms, including mandatory monitoring reports and review by international scientific and technical bodies.

3 Impact of BBNJ EIA rules on china under the SWOT-PEST framework

The SWOT-PEST analytical model is an essential tool for conducting comprehensive assessments, integrating both SWOT and PEST analyses. SWOT analysis evaluates the strategic position

of a subject by examining its internal and external competitive environment and conditions. This is done by analyzing Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T) to provide a systematic and accurate understanding of the context in which the subject operates, thereby facilitating the development of scientific and optimized strategies. PEST analysis, on the other hand, is a macro-environmental assessment tool that evaluates a subject's external environment across four key dimensions: Political (P), Economic (E), Social (S), and Technological (T). By integrating these two methodologies, the SWOT-PEST analytical model creates a more holistic framework that links internal and external factors while combining macro- and micro-level assessments. This approach enables a thorough analysis of an entity's strengths and weaknesses, as well as the opportunities and threats it faces within political, economic, social, and technological dimensions.

This study applies the SWOT-PEST analysis to comprehensively assess and evaluate China's position under the BBNJ EIA framework. By constructing a SWOT-PEST analytical matrix (Table 1), this study aims to explore potential strategies for China's response to the evolving regulatory landscape.

3.1 Strengths

3.1.1 Political strengths

In 2012, China officially established its national strategy of becoming a maritime power. This strategic objective was not only a major initiative in line with global development trends but also a coordinated plan that aligns maritime development with national construction. Under the framework of this strategy, China has undertaken a series of initiatives that have not only achieved significant progress in domestic marine public goods and institutional development but also contributed to the establishment of a new international maritime order (Liu, 2022). Building a maritime power is essential for ensuring the sustained and healthy development of China's highly ocean-dependent export-oriented economy. It is also a critical response to China's increasing reliance on marine resources and space. Furthermore, developing into a maritime power is integral to China's broader goal of achieving socialist modernization (Zhang and Wei, 2024) and serves as a crucial mechanism for safeguarding and expanding

TABLE 1 Analysis matrix of the impact of BBNJ EIA rules on China under the SWOT-PEST framework.

SWOT-PEST	Political	Economic	Social	Technological
Strengths	Policy and legal support	Healthy development of marine economy	Social support from different entities	Continuous technological progress and breakthroughs
Weaknesses	Incomplete laws and pressure to connect	Multiple pressures such as rising costs, delayed returns and limited strategic investments	Significant gap with the international community	Core technology 'bottleneck'
Opportunities	Enhancing international discourse power and playing a greater role	Promote enterprise transformation and upgrading	Multi subject development opportunities	Marine technology and talent development
Threats	International regulatory barriers	Intensifying competition for resources	Social pressure and rising adaptation costs	Technical barriers

China's maritime rights and interests beyond its jurisdictional waters.

China's domestic legal framework for environmental protection has been continuously improved. As one of the earliest countries to introduce an EIA system, China established the EIA mechanism in the Environmental Protection Law (Trial Implementation) of 1979. In 2002, China enacted a dedicated Environmental Impact Assessment Law, which was subsequently amended twice, in 2016 and 2018. These legal developments have led to the establishment of a dual-track EIA system, covering both planning and construction projects.

In 2016, China promulgated the Deep-Sea Seabed Resource Exploration and Development Law, which aims to “regulate the exploration and development of deep-sea seabed resources, promote deep-sea scientific and technological research, conduct resource surveys, protect the marine environment, promote the sustainable utilization of deep-sea seabed resources, and safeguard the common interests of humankind.” This legislation not only responds to the UNCLOS but also reflects China's commitment to preserving the common interests of humanity and plays a crucial role in the protection of the marine environment in the ‘Area’—the seabed beyond national jurisdiction (Zhang and Wu, 2016).

In 2023, China revised its Marine Environmental Protection Law to better align with the needs of marine ecological protection, providing a more precise legal safeguard for improving marine environmental quality, building a maritime power, and contributing to the Beautiful China initiative (Sun, 2023).

3.1.2 Economic strengths

Since the 13th Five-Year Plan, China has achieved significant progress in distant-water fisheries through measures such as stabilizing fishing capacity, optimizing industry structure, upgrading equipment, promoting technological innovation, strengthening regulatory frameworks, and deepening international cooperation (Chen, 2022). The steady and sustainable development of distant-water fisheries has not only strengthened the overall marine economy but also provides a critical economic foundation for fulfilling obligations under the BBNJ Agreement's EIA rules. Economically, the high-quality growth of the marine sector enables investment in advanced monitoring, assessment, and environmentally-friendly technologies, directly supporting compliance with EIA procedures and standards. Moreover, the optimization of the industrial structure—shifting toward higher-value, low-impact operations—reduces potential environmental risks. Financially, government subsidies, green transformation funds, and incentives for technological upgrading help enterprises mitigate the short-term costs associated with meeting stringent international EIA requirements. International collaboration in fisheries (He, 2024) and marine governance further reinforces economic resilience by opening access to shared data, technical resources, and market opportunities, which can offset competitive disadvantages arising from stricter environmental regulations. In sum, China's robust marine economic base, combined with targeted financial support, industrial restructuring, and international collaboration, equips the country to meet BBNJ EIA requirements

effectively while simultaneously promoting sustainable development and enhancing the international competitiveness of its marine industry.

3.1.3 Social strengths

From a social perspective, China possesses multiple advantages that support the implementation of BBNJ EIA rules. At the national level, the Chinese government places high importance on ecological civilization, embedding the concept of “Chinese-style modernization with harmonious coexistence between humans and nature” as part of its overall development strategy. This approach aims to create a new form of human ecological civilization (Fang, 2023), not only promotes domestic sustainable development but also aligns with the goals of BBNJ, facilitating the integration of international rules into national legislation. In recent years, public awareness and participation in marine environmental protection have steadily increased, with citizens showing growing concern for biodiversity conservation, marine pollution, and sustainable fisheries. This rising environmental consciousness provides a solid social foundation for the acceptance and implementation of EIA procedures. Meanwhile, encouraged by government policies that promote social capital participation, enterprises and civil society organizations are increasingly involved in marine ecological protection and restoration projects (Wang, 2023). Companies are gradually pursuing green transformation, adopting environmentally friendly technologies, and aligning with international standards, thereby reducing compliance risks under BBNJ. Interactions among these multiple stakeholders generate a synergistic effect, collectively providing strong societal support for the effective implementation of BBNJ EIA rules and fostering a collaborative environment for sustainable marine governance.

3.1.4 Technological strengths

China's continuous breakthroughs in deep-sea technology provide strong technical support for conducting deep-sea activities. As human understanding of the ocean deepens, marine development has extended from shallow to deep waters. Mastery of deep-sea technology is a prerequisite for deep-sea exploration and utilization, granting a strategic advantage in resource development. China's advancements in deep-sea technology have laid the foundation for these activities. Breakthroughs such as the 2021 environmental assessment of a 1,000-meter polymetallic nodule mining trial in the South China Sea (Feng and Yang, 2024) and the commissioning of the domestically built deep-sea drilling vessel Mengxiang in 2024 (Yang, 2024) demonstrate China's growing expertise in deep-sea exploration and resource development.

Simultaneously, continuous advancements in EIA technology have accumulated expertise, laying the foundation for implementing BBNJ EIA regulations. As early as 1993, China formulated the Technical Guidelines for Environmental Impact Assessment – General Principles (HJ/T 2.1-93), which underwent revision in 2011. Subsequently, China developed and issued EIA technical standards for both construction projects and planning. In 2025, China further updated its marine ecological EIA standards to guide and regulate EIA processes for construction projects affecting

the marine ecosystem. These advancements provide crucial technical support for the effective implementation of BBNJ EIA rules.

3.2 Weaknesses

3.2.1 Political weaknesses

Although China has continuously improved its legal framework for marine protection, aligning with the BBNJ Agreement and effectively advancing EIA activities in ABNJ still presents at least two significant challenges.

First, gaps remain in domestic legislation. For example, while the Deep-Sea Seabed Resource Exploration and Development Law includes provisions on environmental protection in Chapter 3, it lacks detailed regulations on EIA, environmental monitoring, and other related mechanisms. Additionally, its provisions on marine biodiversity conservation remain broad and general, with limited practical applicability. Similarly, the Environmental Impact Assessment Law primarily regulates EIA activities for construction projects and planning within national jurisdiction, without establishing clear EIA rules for activities in the high seas or international seabed areas, resulting in a legislative gap.

Second, China's domestic legislation lacks sufficient alignment with international regulations. The BBNJ Agreement serves as an implementing agreement under the UNCLOS, and its EIA provisions reflect the increasing integration of various marine activities into a more comprehensive regulatory framework. As a potential contracting party, China is obligated to comply with the EIA requirements established by the new agreement. However, discrepancies between China's existing domestic laws and international rules necessitate legislative adjustments, increasing policy adaptation costs.

3.2.2 Economic weaknesses

Facing the stricter BBNJ EIA rules, Chinese enterprises and industries will encounter increased operational costs in areas beyond national jurisdiction. Unlike domestic EIA requirements, the BBNJ framework mandates comprehensive assessments that cover not only key environmental impacts but also social, economic, human health, cumulative, and jurisdictional effects. This expanded scope necessitates greater investments in expert consultation, data collection, monitoring, and reporting, thereby raising short-term operational expenditures and extending project timelines. Consequently, the additional compliance costs may be transferred to product prices, undermining international competitiveness, particularly for price-sensitive sectors such as distant-water fisheries and deep-sea resource industries. Moreover, firms may face pressures to reallocate resources from innovation, technology upgrades, or market expansion toward compliance activities, potentially hindering long-term industrial transformation. The compounded effect of higher costs, delayed returns, and constrained strategic investment underscores the economic disadvantage imposed by the BBNJ EIA rules, highlighting the critical need for policy support and strategic planning to mitigate these burdens, promote the comprehensive transformation of

enterprises and sustain international competitiveness, while also emphasizing the importance of technological innovation and capacity building to adapt to evolving global environmental governance standards.

3.2.3 Social weaknesses

In the social advantages section, it is evident that various stakeholders in Chinese society are demonstrating increasing awareness and enthusiasm for marine ecological protection. However, a significant gap remains between domestic efforts and international standards. For example, while environmental awareness in China has improved, public awareness of marine issues remains relatively weak compared to developed countries (Zhang et al., 2023), and recognition of EIA regulations is still low. Furthermore, the capacity of domestic enterprises for green transformation requires further enhancement.

Beyond societal awareness, China's marine biodiversity status is also a cause for concern, necessitating urgent solutions. Overfishing (Rieser, 1997), land reclamation projects (Chen et al., 2023), maritime trade (Carlton, 2010), the introduction of invasive species through ballast water (Silva and Pinto Moreira, 2019), and climate change (Poelss and Krivickaitė, 2009) all pose serious threats to marine biodiversity. These factors contribute to habitat destruction and biodiversity loss, exposing China's marine ecosystems to multiple risks, including illegal and excessive fishing, habitat degradation, invasive species intrusion, and climate-induced disruptions. Addressing these challenges requires both domestic policy innovation and international cooperation to adopt best practices and effective conservation strategies.

3.2.4 Technological weaknesses

However, in terms of technology, China faces more pronounced disadvantages. In key areas such as deep-sea exploration, environmental monitoring, and deepwater experiments, critical equipment and instruments remain heavily dependent on foreign imports (Zhao et al., 2024). For instance, in deep-sea EIAs, China has yet to achieve full self-sufficiency in core technologies such as subsea sensing, communication, and safety monitoring, resulting in a technological bottleneck (Feng and Yang, 2024).

Moreover, essential software for EIAs, including big data processing and ecological modeling, is predominantly developed by advanced economies, leaving China without internationally competitive systems and constrained by foreign standards. Additionally, China lacks long-term observational data for specific high seas regions and has yet to establish targeted environmental impact thresholds. This shortcoming makes it challenging to propose scientifically grounded, localized EIA standards, potentially weakening China's empirical support in international negotiations. Furthermore, China's participation in global data-sharing mechanisms remains limited, affecting its influence in the provision of EIA-related data.

In summary, while China has made notable progress in deep-sea and EIA technologies, a substantial gap persists compared to developed nations, necessitating continued advancements to enhance technological autonomy and global competitiveness.

3.3 Opportunities

3.3.1 Political opportunities

The BBNJ Agreement presents China with an opportunity to play a greater role in global ocean governance, potentially enhancing its international discourse power and enabling China to contribute its wisdom and solutions to global ocean governance. As a systemic mechanism that has emerged in the process of globalization, global ocean governance fundamentally aims to address challenges such as marine environmental management and resource allocation through international regulatory constraints and multilateral consultation mechanisms. It involves the coordinated participation of multiple stakeholders, including sovereign states, intergovernmental organizations, non-governmental entities, transnational market players, and the public, with the ultimate goal of achieving a harmonious human-ocean relationship, sustainable marine resource utilization, and the protection of global marine ecosystems (Cui, 2025).

Having signed the BBNJ Agreement, China can actively propose value concepts reflecting its national marine spirit and cultural connotations during the process of adapting and implementing EIA regulations. This includes articulating the core values and shared interests that China upholds in its participation in global ocean governance in the new era (Chen and Sun, 2024). By leveraging the concept of a “Maritime Community with a Shared Future,” China can play a more active and constructive role in the global ocean governance system, influence the process of international legislation, and promote the development of global ocean governance toward a more just and equitable framework (Wang, 2023).

3.3.2 Economic opportunities

Under the influence of stricter EIA regulations, while operational costs may rise, these requirements also provide an opportunity for enterprises to upgrade and transform. Additionally, emerging industries such as environmental protection and ecological restoration may be stimulated, potentially becoming new drivers of economic growth.

First, the stringency of BBNJ EIA regulations aims to promote the sustainable development of the ocean, which, in turn, will encourage China’s marine economy to evolve toward a greener, low-carbon, and high-value-added model. Second, the demand for technologies related to environmental monitoring, ecological damage assessment, and biodiversity conservation is expected to increase, creating market opportunities for China’s environmental protection enterprises and research institutions to expand domestically and enhance their global competitiveness. Third, as businesses and investors increasingly prioritize ESG (Environmental, Social, and Governance) factors in decision-making (Kovvali and Listokin, 2024), Chinese enterprises that comply with stringent EIA regulations may find it easier to attract international investment, further accelerating the transformation and upgrading of the marine economy. Fourth, by adhering to strict EIA procedural requirements, China can engage in resource exploration and extraction within the framework of international regulations, ensuring the sustainability of marine resource development.

In sum, while stricter EIA regulations impose challenges, they also present significant opportunities for China’s marine economy.

3.3.3 Social opportunities

The adoption of the BBNJ Agreement’s EIA rules presents numerous opportunities for Chinese society.

At the governmental level, the EIA provisions in the BBNJ Agreement can drive policymakers to optimize marine ecological protection policies, enhance attention to the conservation of marine biodiversity beyond national jurisdiction, and demonstrate China’s commitment to sustainable ocean development. This, in turn, can bolster China’s international credibility.

For enterprises, stringent EIA regulations encourage them to assume greater social responsibility, and such responsibility plays a significant role in driving green innovation (Yu et al., 2024). Additionally, these regulations may prompt marine-related industry associations to establish stricter self-regulatory standards, thereby enhancing the overall sense of social responsibility within the sector.

For the public and social organizations, the EIA rules provide a pathway for broader participation in EIA activities, improving public awareness of EIA regulations and fostering ecological literacy. Moreover, they empower civil society organizations to play a more active role in policy oversight, social cooperation, and public-private interactions. Because, according to Article 32 of the BBNJ Agreement, stakeholders—including civil society, the general public, and the scientific community—are explicitly allowed to participate in the EIA process by submitting comments and engaging in consultations.

3.3.4 Technological opportunities

EIA, as a scientific method and technical tool, is based on environmental monitoring technologies, pollutant diffusion patterns, the impact of environmental factors on human health, and the self-purification capacity of ecosystems. Conducting EIA activities under the BBNJ Agreement requires specialized expertise and technical capacity, which will, in turn, drive advancements in China’s EIA technologies and the development of a skilled workforce in this field. Part V of the BBNJ Agreement explicitly addresses capacity-building and marine technology transfer, with one of its key objectives being to support developing country parties in achieving the goals established under the EIA provisions. As a developing country, China can leverage this advantage to engage with technologically advanced nations in knowledge-sharing and cooperation, while respecting intellectual property rights. By learning from global best practices and innovations, China can accelerate its own technological progress in environmental assessment.

For instance, in the domain of marine environmental monitoring technology, although recent industrial advancements have yielded successive breakthroughs, with certain segments attaining internationally advanced standards, persistent challenges remain, including excessive reliance on foreign technologies, limited industrial integration, and insufficient validation of product reliability and operational stability (Li et al., 2024). Furthermore, in deep-sea operations, emerging robotic platforms are essential for

execution (Aguzzi et al., 2024), such as the invention of seabed mining vehicles for deep-sea mining (Liu et al., 2023). Moving forward, China can utilize the BBNJ framework to enhance cooperation and exchange, integrating digitalization, intelligence, and independent innovation to improve its technological capabilities in marine environmental assessment and monitoring.

3.4 Threats

3.4.1 Political threats

From a political perspective, the EIA rules under the BBNJ Agreement are not merely technical and procedural norms but also a new arena for the contestation of national interests. National interest is the fundamental starting point for all countries in treaty negotiations and the construction of cooperative mechanisms. Divergent national interests shape the positions and choices of different countries (Trifunović and Čurčić, 2021). The negotiation and formulation of treaties revolve around national interests, with common interests forming the basis for international cooperation, while conflicts of interest may lead to negotiation deadlocks or failed collaborations. When China engages in activities on the high seas and in ABNJ, it may face policy-related resistance from certain developed or interested states. These states may use the EIA process to impose barriers on China's high seas development, reducing the likelihood that normal development and utilization activities can pass environmental assessments. Furthermore, the dominance of developed countries in rule making within international organizations and multilateral mechanisms places China at a relative disadvantage in interpreting rules, setting standards, and resolving disputes, thereby increasing external political pressure. Major powers often seek to use treaty systems to consolidate an international order that aligns with their own strategic advantages, whereas emerging and developing countries aim to reshape international rules through cooperation to achieve a more balanced distribution of interests. Such political pressures may not only delay the progress of Chinese enterprises and research projects but also constrain China's ability to exert its role in the international community.

3.4.2 Economic threats

As one of the core regulatory mechanisms of the BBNJ Agreement, the EIA rules may pose external economic challenges to China's distant-water fisheries, deep-sea mining, marine engineering, and shipping industries. First, the stringent procedural requirements of EIA rules could make the approval process for high seas development projects or engineering ventures more complex and prolonged, increasing investment uncertainty for enterprises and potentially affecting the advancement of Chinese offshore projects as well as the return-on-investment timeline. Second, the obligation to involve adjacent coastal states and potentially affected stakeholders provides certain coastal states with a regulatory tool to adopt protectionist measures or establish regional cooperation mechanisms aimed at restricting Chinese enterprises. This not only raises negotiation and compliance costs

but may also compel Chinese companies to make unfavorable concessions in resource allocation or cooperation terms. Additionally, strict EIA regulations could serve as a form of "green trade barrier," thereby indirectly limiting China's distant-water fishing, seafood exports, and marine resource exploitation, and undermining its international competitiveness.

In summary, such external economic pressure may drive Chinese enterprises to accelerate green transformation and technological upgrading, but in the short term, it is likely to raise production costs, reduce profit margins, and weaken China's market share and bargaining power in the global ocean economy.

3.4.3 Social threats

Social threats mainly include the following aspects. First, growing international public opinion pressure. International organizations and media may intensify scrutiny over China's implementation of EIA in ABNJ, increasing global pressure on China.

Second, intensified competition over marine rights. EIA rules under the BBNJ Agreement may become a tool for geopolitical rivalry. Some countries might use them to restrict China's resource development in ABNJ, affecting its role in global ocean governance.

Third, rising global pressure on China's distant-water industries. Under the BBNJ Agreement, Chinese companies must disclose EIA reports publicly, which could lead to increased international demands for stricter environmental standards or market access restrictions. Industries like fisheries, shipping, and marine engineering may face higher compliance costs, potentially causing job losses or lower incomes.

Lastly, the unfair dominance in rule-making may affect China's social interests. The formulation of EIA rules has been predominantly led by developed nations, reflecting a power struggle among different interest groups. Consequently, some of these rules may not fully align with China's developmental needs, placing an additional and potentially unreasonable burden on Chinese enterprises and society during implementation.

3.4.4 Technological threats

The deep sea has become an essential and shared foundation for the future development of humanity, and driving the advancement of deep-sea technology has become a national strategy for many countries. China's research on deep-sea scientific drilling technology started relatively late, and it has so far played only a "participating member" role in international deep-sea scientific drilling, resulting in a mismatch between China's capabilities and international influence in deep-sea research and its status as a major power (Xiong et al., 2025). This has, to some extent, directly led to China lagging behind in deep-sea scientific research and becoming technically dependent on others.

Some advanced technologies and equipment are still dominated by developed countries, which presents a dependency risk for China in key technologies. The international technology monopoly means that conducting planned activities under the EIA rules will face higher costs and technical barriers, which, to some extent, increases international competitive pressure.

The rule-making is led by developed countries, and there are challenges in applying a unified EIA standard. Developed countries, with their financial and technological advantages, advocate for setting high standards by refining assessment thresholds and raising evaluation barriers under the BBNJ Agreement, in order to strengthen marine protection. This may, in turn, restrict the entry of other countries into marine activities (Jiang and Lu, 2023).

Developed countries hold numerous patents in advanced deep-sea technologies, which may lead to the creation of intellectual property-based technical barriers. The risk of technological blockade makes it difficult for China to make breakthroughs in EIA-related technologies in the short term.

4 Potential response strategies for China

Through a comprehensive SWOT-PEST analysis, it is evident that China faces both opportunities and challenges under the impact of the BBNJ EIA rules. To seize historical opportunities and address future challenges, China can adopt the following strategies.

4.1 SO Strategy

The SO strategy aims to maximize benefits by leveraging strengths to seize opportunities. Specifically, in this study, China's SO strategy should focus on utilizing its existing advantages, such as policy support and high-quality economic development, to actively participate in global ocean governance, enhance international discourse power, and contribute Chinese wisdom and solutions to the world.

4.1.1 Guiding value with the “maritime community with a shared future” concept to strengthen international cooperation and promote the understanding and application of BBNJ EIA rules

On April 23, 2019, during the International Naval Forum marking the 70th anniversary of the People's Liberation Army Navy in Qingdao, China officially introduced the concept of a “Maritime Community with a Shared Future” to the international community. This concept builds upon the principles of a “Community of Shared Future for Mankind” and “Harmonious Ocean,” emphasizing the critical role of the ocean for humanity and calling for joint efforts to maintain maritime peace, security, and sustainable development.

The concept encompasses various dimensions, including politics, economy, culture, ecology, and security. Its core objective is to build a harmonious, peaceful, and healthy ocean, thereby fostering the harmonious coexistence between humankind and the marine environment (Zhu et al., 2024). The geographical nature of the ocean does not separate landmasses but rather serves as a bridge connecting them. By leveraging oceanic connectivity, countries can enhance cooperation and achieve mutual benefits.

As an extension and deepening of the concept of building “A Community with a Shared Future for Mankind,” the notion of “A Maritime Community with a Shared Future” underscores the shared destiny among nations and between humanity and the ocean, encourages coastal states to work together in addressing common maritime challenges (Zhang and Xu, 2024), and advocates for cooperation and multilateral governance to tackle global challenges and ensure the sustainable use of marine resources. Given the global nature of high seas resources and the varying interpretations of EIA rules among nations, this concept can serve as a guiding value to deepen international cooperation and facilitate the fair and rational application of BBNJ EIA regulations.

4.1.2 Seizing opportunities to enhance global influence and contribute Chinese insights

China's internal strengths provide a solid foundation for effectively integrating and implementing the BBNJ EIA framework. As a nation committed to ecological civilization, China has consistently maintained a global perspective in its environmental governance. President Xi Jinping's vision of harmonious coexistence between humanity and nature not only guides China's domestic modernization but also aligns with the broader goal of fostering a shared future for mankind. This commitment extends to international environmental governance, where China actively promotes sustainable development and ecological balance worldwide (Wang and Li, 2022).

China has played a significant role in shaping global ocean governance, advocating for a more equitable and effective international system. The country has been deeply engaged in multilateral maritime governance, contributing to institutions such as the United Nations Environment Programme (UNEP), the Intergovernmental Oceanographic Commission of UNESCO, the International Seabed Authority, and the International Maritime Organization. Additionally, China has been an active participant in key international negotiations, including the UNCLOS and the Antarctic Treaty Consultative Meetings. Since 2012, China has submitted over 120 proposals to international polar governance organizations and more than 700 proposals to the International Maritime Organization, significantly shaping global environmental protection and resource management policies. (White Paper on China's Marine Ecological Environment Protection).

With a stable and growing marine economy, continuously advancing oceanic technology, and broad domestic support, China is well-positioned to leverage the opportunities presented by the BBNJ EIA framework. By actively engaging in negotiations on technology, regulations, and standards, China can contribute to the formation of a fair and balanced international maritime order. The BBNJ Agreement offers a new platform for global ocean governance, and China should seize this opportunity to share its governance expertise, ensuring the sustainable and equitable use of marine resources on a global scale.

4.2 ST strategy

The ST strategy focuses on mitigating threats by leveraging internal strengths. Essentially, technology is the core issue in the

BBNJ EIA framework—whoever holds the key technologies gains a strategic advantage. Whether in rule negotiation or implementation, those with technological dominance tend to lead and control the discourse. Therefore, the ST strategy should prioritize technological development.

4.2.1 Focus on key areas to achieve technological self-sufficiency and control

Strengthening core technologies is crucial, as relying on foreign technology is not sustainable. Under the BBNJ framework, environmental monitoring and deep-sea resource exploration require advanced technologies and equipment. China should actively develop key technologies in these areas. In marine data collection and analysis, using big data and AI can improve EIA efficiency and accuracy. At the same time, deeper collaboration between industry, academia, and research is essential. China should support marine research institutes, universities, and labs while training interdisciplinary talent. Large enterprises in marine engineering, equipment manufacturing, and environmental technology should set up R&D centers and work closely with research institutions to tackle key technological challenges.

4.2.2 Build a technological defense system to mitigate external restrictions

Intellectual property (IP) is a critical issue in international technology exchange and must be carefully managed. While respecting foreign IP rights, China should also strengthen domestic IP protection to prevent core technology leakage. Additionally, China should expand its voice in marine monitoring, data analysis, and environmental technology, promoting its technological solutions globally to reduce the impact of technical barriers. International cooperation is also essential. Through “the Belt and Road” Initiative, China can form technology partnerships with participating countries, leveraging collective strengths for joint R&D, cost-sharing, and risk reduction. Actively engaging in international academic conferences and attracting top global talent will further facilitate access to the latest research and advancements.

4.2.3 Strengthen talent development to enhance sustainable innovation

Skilled professionals are essential for technological breakthroughs, making talent acquisition and development a priority for China’s sustainable progress in marine technology. For talent acquisition, China should implement flexible mechanisms to attract top global experts in marine environmental assessment, ocean engineering, and deep-sea technology, accelerating technological advancements.

For talent development:

1. Universities should integrate disciplines such as biology, chemistry, geology, and ecology to foster interdisciplinary research and cultivate specialized talent in marine sciences (Li et al., 2025).
2. Businesses should establish training and R&D funds to support employee education and skill development, strengthening internal expertise.

3. Research institutions should form multidisciplinary teams, bringing together marine scientists, engineers, legal experts, and international relations specialists to better navigate evolving technologies and global regulations.

The core strategy at the technical level is to fully leverage existing technological advantages, concentrate efforts on tackling key difficulties, and at the same time build a comprehensive protection system to cope with possible external technological blockades and standard barriers. By combining independent research, international collaboration, and talent development, China can establish a self-sufficient yet open and cooperative marine technology ecosystem. This approach will ensure sustainable technological advancements under the EIA framework of the BBNJ agreement.

4.3 WO strategy

The WO strategy focuses on leveraging opportunities to overcome weaknesses, transforming disadvantages into strengths. In deep-sea activities, enterprises are the primary actors and the most directly affected by EIA regulations. Their ability to adapt and respond to these rules significantly impacts a nation’s maritime interests and rights. Under the BBNJ EIA framework, Chinese enterprises face high compliance costs, but this also presents an opportunity for industrial upgrading.

Therefore, this WO strategy will focus on the corporate level while acknowledging the crucial role of government support in facilitating enterprise transformation. By seizing opportunities for upgrading, reducing compliance costs, and enhancing international competitiveness, Chinese enterprises can strengthen their position in global marine governance and contribute to safeguarding the country’s maritime interests and rights.

4.3.1 At the national level

The government can support enterprise transformation through financial assistance and fiscal incentives. A key barrier preventing companies from proactively upgrading is funding constraints, including a lack of capital for transformation and increased post-upgrade costs. Addressing these financial challenges from the enterprise perspective is essential for promoting sustainable transitions.

Establishing national marine fund can support technological upgrades. For example, the government could create a industrial investment fund in the marine economic zone (Wang and Dai, 2020) to provide direct financial subsidies for companies meeting EIA standards, helping reduce costs associated with technological upgrades and environmental equipment procurement. Additionally, funding incentives should be provided for projects that develop key environmental technologies and lower EIA compliance costs, encouraging innovation.

Tax incentives and low-interest loans should be introduced. Offering tax reductions (Hou and Yang, 2024) or preferential loan terms to environmentally compliant businesses can encourage investments in green technologies and energy-efficient equipment

while easing financial pressure caused by extended return-on-investment periods.

Green financial services should be promoted. Measures should be taken to encourage banks and investment institutions to issue green bonds and ESG investment tools, directing more capital toward sustainable development initiatives, thereby supporting the research, development, and innovation of sustainable technologies (Li and Lin, 2024).

4.3.2 At the enterprise level

Companies should accelerate green technology upgrades and intelligent transformation.

First of all, to facilitate the green transformation and upgrading of industrial sectors, it is imperative to prioritize independent research and technological innovation, which can effectively mitigate compliance costs. This can be achieved through the development and implementation of low-carbon and low-pollution production technologies, enhancement of resource utilization efficiency, and reduction of waste emissions. Such strategic approaches enable enterprises to substantially decrease their long-term investments in environmental compliance by addressing pollution prevention at the source. For example, the deep-sea mining industry should develop low-impact, high-reliability, and intelligent mining technologies to mitigate environmental harm and lower EIA compliance costs (Zhang et al., 2025).

Then, fostering industry chain integration can enhance synergy. By aligning upstream and downstream sectors, companies can create cooperative networks to share technologies and resources. Joint R&D initiatives with suppliers, research institutes, and other stakeholders can accelerate breakthroughs in cost-effective EIA-compliant technologies while reducing the risk of R&D failures.

Third, expanding into international markets and strengthening brand reputation is essential. Chinese enterprises can leverage “the Belt and Road” Initiative to diversify market opportunities and reduce dependence on a single region. Obtaining international green certifications can enhance their eco-friendly image and global competitiveness, easing the financial burden of green transitions. Establishing partnerships with leading foreign firms for joint R&D or technology promotion can create cross-border alliances, mitigating risks associated with international market entry.

Finally, improving internal management and digitalization is crucial. Enterprises should refine management structures to lower operational compliance costs. For instance, setting up dedicated environmental management departments ensures effective implementation of sustainability measures. Additionally, developing internal environmental data-sharing platforms can improve transparency, facilitate timely adjustments to compliance strategies, and reduce overall operational costs.

4.4 WT strategy

The WT strategy focuses on mitigating external threats through internal improvements. A well-developed legal framework is a crucial

threats defense mechanism, particularly in response to the stringent EIA requirements under the BBNJ Agreement. Once the agreement takes effect, signatory states must implement necessary legislative, administrative, or policy measures to ensure compliance, requiring domestic legal adaptation.³⁰ As China has already signed the BBNJ Agreement, future steps, including ratification, will necessitate domestic legal integration to facilitate its effective implementation.

One aspect of this strategy is addressing legislative gaps. While China has established a comprehensive domestic legal framework for EIA, there remain legal voids in ABNJ, such as the high seas and the international seabed area. Under the influence of BBNJ EIA rules, China must refine its domestic legal framework to ensure compliance with international obligations and mitigate increasing international regulatory pressure.

The Environmental Impact Assessment Law outlines EIA categories and procedures but applies only within China’s jurisdiction. Meanwhile, the Deep Seabed Resources Exploration and Development Act includes EIA provisions for ABNJ but is limited to deep-sea mining activities, excluding other sectors such as fisheries and emerging ocean industries. Moreover, China’s domestic laws have yet to address strategic environmental assessments in these regions.

To fulfill international commitments and actively participate in BBNJ affairs, China should establish a legal framework for EIAs beyond national jurisdiction. This involves aligning domestic regulations with BBNJ Agreement requirements and incorporating provisions for assessing the environmental impact of planned activities such as deep-sea fishing, seabed mining, and emerging maritime industries. Such a framework should clarify the objectives, scope, types, procedures, responsibilities, and enforcement mechanisms for EIAs in ABNJ.

Another critical aspect is aligning domestic regulations with international standards. A thorough analysis of the BBNJ Agreement and its EIA requirements is necessary to identify gaps between international obligations and existing domestic regulations. When revising or drafting new laws, China should incorporate well-established international experience to ensure that domestic legal frameworks both meet national needs and align with global standards. Enhancing domestic legal frameworks will facilitate international cooperation in ABNJ. By improving domestic legal norms, we provide support for international cooperation in ABNJ, promote beneficial cooperation among countries in technology research and sharing, and ultimately achieve the goal of biodiversity conservation in ABNJ.

By addressing legislative gaps and aligning domestic laws with international regulations, China can establish a comprehensive, unified, and globally competitive EIA framework for ABNJ. This will not only help mitigate external risks from international regulatory barriers and resource competition but also provide a strong legal foundation for the green transition and sustainable development of China’s marine industries. Ultimately, it will enhance China’s role in global ocean governance.

³⁰ The BBNJ Agreement, Article 53

5 Conclusion

Marine biodiversity is a fundamental component of the global life-support system, playing a crucial role in sustaining societal development and maintaining ecological balance (Wang and Zou, 2020). The adoption of the BBNJ Agreement marks a milestone in global ocean governance and represents significant progress in international maritime law, contributing to the conservation and sustainable use of marine biodiversity in ABNJ. Notably, the agreement's provisions on EIA establish a comprehensive legal framework for planned activities in ABNJ. The EIA rules were developed amid debates on assessment thresholds, types, internationalization, and integration with existing frameworks. Key aspects include defining EIA objectives and state obligations, clarifying the agreement's relationship with relevant legal frameworks and institutions, establishing procedural guidelines, promoting multi-stakeholder participation, and incorporating Strategic Environmental Assessments.

The introduction of the BBNJ EIA rules has significant implications for China as a signatory, presenting both opportunities and challenges. Using the SWOT-PEST analytical framework, the impact of these rules can be assessed from four perspectives—internal strengths and weaknesses, external opportunities and threats—across political, economic, social, and technological dimensions.

1. Politically, China benefits from strong policy support and an emerging legal framework but still faces gaps in legislative completeness. It has the opportunity to enhance its international influence while also encountering increased regulatory pressure.
2. Economically, China's marine economy is stable, yet businesses face rising compliance costs due to stricter environmental regulations. However, this also drives industrial transformation and upgrading, though competition for marine resources is intensifying.
3. Socially, public and industry acceptance of environmental standards is growing, but there remains a gap compared to global best practices. This presents an opportunity for advancing stakeholder engagement, though adaptation costs are also rising.
4. Technologically, China has made significant advancements in deep-sea exploration, but key technologies are still dominated by developed nations. While there are opportunities for technological upgrades, the country must also address risks posed by technological barriers.

Based on the SWOT-PEST analysis, there may be four types of coping strategies in China.

1. SO Strategy: Leverage domestic advantages such as policy support and high-quality economic growth to actively participate in global ocean governance, enhance international influence, and contribute Chinese solutions and expertise.

2. ST Strategy: Focus on key technological fields to promote independent research and development, build a robust technological defense system, and cultivate talent for sustainable innovation and self-sufficiency.
3. WO Strategy: Chinese enterprises should seize opportunities for industrial transformation and upgrading, reduce compliance costs, enhance international competitiveness, and safeguard national maritime interests and rights.
4. WT Strategy: China should integrate ABNJ EIA rules into domestic legislation to ensure the implementation of the BBNJ agreement while using legal adaptation and alignment to mitigate external threats posed by BBNJ EIA regulations.

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