

Implementing the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement in a State Centric System: The Role of AI in Data Readiness, Corporate Traceability, and EIA Consistency in Areas Beyond National Jurisdiction (ABNJ)

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Abstract

Areas Beyond National Jurisdiction (ABNJ) cover most of the ocean but remain governed through fragmented regimes and uneven scientific capacity. The Biodiversity Beyond National Jurisdiction (BBNJ) Agreement aims to strengthen marine biodiversity conservation in these waters through marine protected areas and other area-based management tools, environmental impact assessment (EIA), marine genetic resources and benefit sharing, and capacity building with technology transfer. This paper argues that early effectiveness will depend less on treaty design and more on implementation capacity. The analysis identifies three challenges. First, data readiness in ABNJ is weak for policy use. Long-term time series are limited, biodiversity records are patchy across depth and habitat, and baseline setting and cumulative impact assessment are hard to operationalize. Second, implementation is state-centric, but many pressures are driven operationally by private actors such as distant-water fishing and large aquaculture and seafood supply chains. The key risk is not the absence of direct corporate duties in international law, but weak traceability and uneven due diligence when States must translate treaty duties into operator-facing requirements and reliable information flows. Third, EIA in ABNJ faces jurisdictional ambiguity. Multiple legal anchors can plausibly apply, and uneven discretion may allow avoidance or minimum standard selection. Artificial Intelligence (AI) can reduce friction in data use, support early risk screening, and improve transparency by structuring documents and disclosures into review-ready evidence. However, AI cannot allocate legal responsibility, decide jurisdiction, resolve regime overlaps, or create political agreement. The paper evaluates AI as a support tool, not a decision maker. The policy implication is that data governance and capacity building should come first, with AI used to amplify these foundations. The UN Ocean Decade is framed as a practical space to test shared tools, standards, and capacity pathways that can make BBNJ implementation more workable.

Keywords: Biodiversity Beyond National Jurisdiction, Areas Beyond National Jurisdiction, AI Governance, Environmental Impact Assessment, Marine Governance

1. Introduction

Areas Beyond National Jurisdiction (ABNJ), commonly described as the high seas and the international seabed, represent the largest governance space on Earth's oceans. ABNJ accounts for about 62 percent of the ocean surface, yet conservation and management tools in these waters have historically been fragmented compared with coastal zones governed through national exclusive economic zones (EEZs). (Gutierrez et al, 2023) This mismatch matters for biodiversity because many pressures on marine ecosystems, including industrial fishing, shipping, and emerging ocean uses, operate across borders and often concentrate in waters where no single country has primary day-to-day management authority.

The Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas

Beyond National Jurisdiction (the BBNJ Agreement), also known as the High Seas Treaty, is a major step toward closing this governance gap. The treaty entered into force on 17 January 2026, following the ratification threshold required for activation. (International Maritime Organization, 2026) The UN describes four core areas addressed by the Agreement: marine genetic resources and benefit sharing; area-based management tools, including marine protected areas; environmental impact assessments (EIA); and capacity building with the transfer of marine technology. (United Nations, 2023) In practical terms, the Agreement creates a pathway to propose and adopt conservation measures for ABNJ and requires countries to assess activities that may cause significant harm to the marine environment. (UK Parliament, 2025)

However, entering into force does not by itself deliver conservation outcomes. Early implementation depends on whether countries can translate treaty commitments into workable routines for monitoring, coordination, and preventive decision-making. This paper argues that three implementation challenges are likely to shape BBNJ's near term effectiveness for marine biodiversity conservation and management: (1) data readiness limitations in ABNJ, especially limited long-term time series and uneven access to observing and analytical capacity; (2) the state-centric structure of the treaty combined with the reality that many biodiversity-relevant ocean activities are driven by corporate actors; and (3) uncertainty about which standards apply, and who is responsible for ensuring compliance, when environmental impact assessments (EIAs) are required for activities in ABNJ.

First, the data challenge for BBNJ is not simply that biodiversity data do not exist. Global data infrastructures for marine biodiversity have advanced substantially. The Ocean Biodiversity Information System (OBIS), supported through UNESCO's ocean data and information networks, has become a widely used open data platform for marine species observations and related information products. (Klein et al, 2019) Yet the data needed for implementation are often different from the data available for research. BBNJ implementation relies on sustained baselines, trend detection, and the ability to evaluate cumulative impacts. In ABNJ, long-term observation remains difficult, and the global observing system is widely described as uneven and vulnerable, with gaps in coverage and heavy reliance on a small set of contributors. (Global Ocean Observing System, 2025) Even within strong biodiversity repositories, data coverage is not uniform across habitats. Peer-reviewed work using global databases has repeatedly shown that the deep pelagic ocean is under-represented relative to surface and seabed records, despite being the largest habitat by volume. (Webb et al, 2010) OBIS itself has documented biases toward shallow coastal areas and surface layers, with recognized gaps in midwater and deep-sea communities. Recent synthesis work also emphasizes that open repositories are valuable for identifying gaps but still face practical challenges when separating ecological contexts and building decision-ready products. (Bridges & Howell, 2025)

These limitations interact with a second data problem: unequal access and unequal capacity. The Ocean Decade has highlighted capacity development as a priority, and scholarship on the Decade stresses persistent disparities in ocean science capacity worldwide. (Harden-Davies et al, 2022) For BBNJ, this matters because implementation requires not only access to datasets but also the ability to collect new observations, maintain workflows, and participate effectively in shared decision-making. In many developing states, including parts of Africa, the constraints are not only financial but also institutional, including limited observing infrastructure and limited ability to process and use marine data at scale. The treaty's capacity building and technology transfer pillar is therefore not peripheral; it is central to whether BBNJ becomes an equitable framework rather than one that reproduces existing asymmetries.

Second, BBNJ implementation is state-centric by design. Under the Agreement, countries meet through a Conference of the Parties, which will make key decisions and develop practical rules over time, including decisions related to area-based measures and implementation procedures. In practice,

national implementation is rarely handled by a single agency. In most countries, ABNJ-related responsibilities span ocean and fisheries administration, foreign affairs, environment and climate policy, and industry and trade. Coordinating across these mandates can be slow, and it can blur accountability when a single national position is needed for international processes. At the same time, many biodiversity-relevant ocean pressures are driven operationally by private actors, including distant-water fishing and large aquaculture and seafood supply chains. This does not imply a flaw in the treaty's legal design, since public international law primarily works through State obligations. The practical implementation question is whether States can translate those obligations into operator-facing requirements and reliable information flows for activities under their jurisdiction or control. If corporate operations involve complex ownership structures, multiple flags, contractors, and supply chains, traceability can be weak and due diligence uneven. (Mendenhall & Hassanali, 2023) In that setting, the key risk is not the absence of direct corporate duties in the treaty, but that State compliance becomes procedural while the data needed for transparency, screening, and preventive decision-making remain partial, inconsistent, or outside government systems.

Third, EIA is a central preventive mechanism in the Agreement, but implementation will require clarity on standards and responsibility. The UK Parliament's research briefing, for example, summarizes that the Agreement requires EIAs for activities in ABNJ that may cause significant harm and sets out procedures for conducting and reporting assessments, with further operational detail expected through treaty bodies. In ABNJ, the difficult question is not only whether an assessment is required, but also which standards should be used and who ultimately checks that those standards are met. Should the relevant yardstick follow the flag state of a vessel, the country that sponsors an activity, the home country of a corporate operator, or decisions adopted collectively through treaty institutions? If these questions remain unresolved, EIAs risk becoming inconsistent across actors and activities, weakening their ability to prevent biodiversity harm.

Against this backdrop, this paper evaluates artificial intelligence (AI) as a practical support tool for early-stage implementation rather than as a substitute for institutions. AI can help turn dispersed data into usable signals, but only within clear limits. In the data domain, AI methods can assist with integrating heterogeneous sources such as biodiversity observations, remote sensing, and environmental variables, and can support gap-aware inference and screening. In the accountability domain, AI can support transparency by structuring information from documents and disclosures, enabling comparisons across sectors and countries, and highlighting inconsistencies between stated commitments and observable activity patterns. In the EIA domain, AI can support upstream stages such as risk screening, evidence organization, and scenario exploration, while leaving normative judgments and legal responsibility to institutions and agreed procedures. The paper also emphasizes an equity constraint: without parallel investments in capacity development and access, AI-enabled tools may deepen existing gaps by concentrating analytical power in already well-resourced contexts.

2. Data Readiness Limitations in ABNJ

Implementation of the Agreement depends on evidence about ecological conditions, pressures, and trends in ABNJ. Yet the current picture of the ocean is still "drastically incomplete," with observations often concentrated near the surface and in coastal areas, and with too few reliable benchmarks to support consistent measurement over time. (Intergovernmental Oceanographic Commission of UNESCO, 2022)

2.1 Lack of Long-term Time-series Data

ABNJ has far fewer continuous observation programs than coastal waters and EEZs. In practice, much of what we know about BBNJ comes from episodic expeditions and scattered records rather than sustained monitoring. Deep-ocean sampling remains difficult, and this logistical barrier directly translates into a scarcity of biological data. (Bridges & Howell, 2025)

Open-access biodiversity repositories illustrate this problem clearly. A recent global assessment using OBIS-based records shows that data coverage is strongly biased toward shallow depths, with offshore and ABNJ benthic environments especially under-sampled. The study notes that further offshore in ABNJ, benthic records in OBIS become “comparatively extremely sparse,” and that large portions of deep benthic environments have little or no open-access record coverage. This is not just a coverage issue. When records are sparse and irregular, it becomes hard to build long-term time series that can support trend detection and causal attribution.

These limitations matter because the BBNJ EIA framework assumes a data foundation that ABNJ often cannot provide. The Agreement requires that an EIA report include a baseline assessment of the marine environment. (United Nations, 2023) It also requires consideration of cumulative impacts during screening, scoping, and impact assessment. When baseline conditions are poorly defined, and change cannot be tracked consistently, it becomes structurally difficult to evaluate whether observed changes are meaningful, whether they are attributable to a given activity, and how multiple pressures accumulate over time.

2.2 Unequal Access to Data Across States

Data scarcity is compounded by unequal access to data and analytical capacity across States. Ocean science capacity is geographically unequal, with a small number of countries operating most ocean monitoring and research programs. (United Nations Ocean Conference, 2022) This inequality is widely recognized as a core obstacle to equitable governance, including under the UN Ocean Decade agenda, where persistent disparities in capacity are described as a major challenge to the goal of reducing inequality.

This imbalance creates a direct tension with the Agreement’s emphasis on fair and effective participation. The Agreement explicitly recognizes that support for developing States through capacity building and the development and transfer of marine technology is essential for achieving its objectives. It also highlights the needs of specific groups of developing States, including coastal African States, as priorities for capacity development. In implementation terms, countries with stronger observing infrastructure and technical expertise are better positioned to define baselines, interpret risk, and shape decision inputs, while less-resourced countries may participate in procedures without having a comparable ability to generate or evaluate the underlying evidence.

For this reason, capacity building under BBNJ should be treated as a core implementation mechanism rather than a secondary add-on. Without practical support for data access, processing, and interpretation, “participation” risks will become procedural rather than substantive.

2.3 The Limited but Practical Role of AI in Data Readiness

AI can support implementation in ABNJ in terms of data readiness, but only within clear limits. A practical pathway is to combine satellite and remote sensing products with existing biodiversity records such as those in OBIS, using models to estimate likely conditions in data-poor areas and to flag regions that warrant precaution or further study. Satellite remote sensing can provide consistent monitoring across large geographic areas for some targets, and it has been used to map and monitor

marine habitats at scales that field surveys cannot achieve. (Kavanaugh et al, 2021) At the same time, satellites have historically measured mostly surface attributes, and even newer methods remain constrained in what they can observe below the surface.

In this setting, AI can be most useful as a screening and prioritization tool. For example, data-driven gap analyses of open-access datasets can identify chronic under-sampling and highlight high-priority regions for future observation and exploration. Models can also combine environmental covariates with sparse biological records to generate risk indicators and uncertainty-aware maps that help direct limited monitoring budgets.

However, AI cannot “create” long-term time series where none exist. It can only infer patterns from available signals, and those inferences can be wrong. Machine learning models can overfit, behave poorly in new regimes, and produce estimates that are not physically plausible, especially when evaluation and uncertainty quantification are weak. (Gray et al, 2024) For ABNJ governance, this implies that AI outputs should be treated as decision support rather than evidence of record.

Finally, AI cannot directly resolve legal judgments or liability. Under the Agreement, the decision to authorize a planned activity remains with the Party exercising jurisdiction or control, based on the required assessment process and consideration of mitigation measures. AI tools may inform analysis, but they cannot substitute for the legal responsibility and accountability that the Agreement places on States.

3. State-Centric Governance vs. Corporate-Led Ocean Activities

3.1 Coordination Challenges within States

The BBNJ Agreement is implemented by States. Core duties such as screening, conducting, publishing, and reviewing EIAs are framed as obligations of “Parties,” especially for “planned activities under their jurisdiction or control.” This design makes national implementation the main delivery mechanism, even when the underlying activity is operationally driven by private actors. (United Nations, 2023)

In practice, this design requires whole-of-government coordination. National implementation is not only a legal exercise but also an administrative one that depends on aligning mandates across agencies that do not normally share data pipelines or decision criteria. In policy terms, recent implementation guidance often highlights the need for national legislation and the designation of a national focal point, which again requires cross-ministry coordination and a clear division of roles. (Commonwealth Secretariat, 2025) As a case of South Korea, BBNJ-related work can touch at least four different Ministries which include the Ministry of Oceans and Fisheries to handle marine policy, fisheries policy, and maritime industry policy, the Ministry of Foreign Affairs for treaty process, multilateral diplomacy, and international negotiation alignment, the Ministry of Climate, Energy, and Environment for EIA practice, biodiversity and climate related policy, and Ministry of Trade, Industry and Resources to handle industrial policy, energy policy, and corporate competitiveness concerns.

When responsibilities are split this way, common friction points include fragmented datasets, inconsistent success metrics across agencies, and unclear accountability when a single national position must be delivered for international procedures. The result can be slow implementation, inconsistent national positions in international meetings, and weak follow-through, especially when reporting and transparency obligations increase over time through instruments like the Clearing-House Mechanism.

3.2 Corporate Actors as Real-World Drivers of Ocean Impact

It is correct that public international law, including UN treaties, primarily regulates States rather than corporations directly. The BBNJ Agreement follows that structure. The implementation question is therefore not whether corporations should be direct subjects of the treaty, but whether States can reliably translate State-level duties into operator-facing requirements and data flows that are strong enough to make ABNJ governance work in practice.

This interface problem matters because many biodiversity-relevant ocean pressures are driven operationally by private actors. Distant-water fishing is a clear example. It is carried out by fleets and firms day to day, but it is structured through domestic permits, planning, and monitoring systems that the State uses to exercise jurisdiction or control. In South Korea, the Distant Water Fisheries Development Act frames distant-water fisheries as an industry linked to national economic goals, assigns planning and permitting authority to the Minister of Oceans and Fisheries, and includes provisions aimed at monitoring and transparency. (Republic of Korea, 2024)

The Agreement itself anticipates this State-mediated pathway. It repeatedly requires Parties to take legislative, administrative, or policy measures to implement obligations and to ensure that activities by natural or juridical persons under their jurisdiction are channeled into treaty procedures and information systems. In the EIA provisions, the core trigger is a planned activity under a Party's jurisdiction or control, and the Party must make screening determinations, reports, and certain decision documents public, including through the Clearing-House Mechanism. This means that effective implementation depends on whether States can obtain timely, credible information from operators and translate it into comparable public documentation.

Empirical monitoring research shows why this is difficult. Using Global Fishing Watch Automatic Identification System (AIS) fishing effort data, Cappa et al. (2024) compare AIS-derived catch estimates with catches reported by countries to the UN Food and Agriculture Organization and find substantial discrepancies, alongside a discussion of incomplete AIS coverage and potential AIS disabling or evasion by some fleets. These results are important for BBNJ implementation because they illustrate a practical constraint. Even where a State has a jurisdictional hook, the operational data needed for transparency, compliance checks, and impact assessment may be partial, strategically withheld, or difficult to validate. (Cappa et al, 2024)

Ownership and control also complicate State-mediated governance. Kinds et al. (2025) show that focusing only on flag states can underestimate corporate control and fishing capacity when ultimate ownership is mapped, and they argue that ownership-aware governance is important for transparency and accountability in industrial tuna fisheries. (Kinds et al, 2025) For BBNJ, this implies that jurisdiction or control may be legally attributable, but the real-world operator profile that matters for monitoring and risk management can remain opaque unless States require stronger disclosure and traceability.

A similar State-mediated pattern exists in coastal industries that shape national priorities and administrative capacity, even though the BBNJ Agreement applies to ABNJ. South Korea's Ministry of Oceans and Fisheries' work plan for 2024 sets explicit export targets for seaweed and tuna, illustrating how ocean policy can be intertwined with industrial competitiveness and export strategy. (Ministry of Oceans and Fisheries (Republic of Korea), 2024) At the same time, Chen et al (2025) treat seaweed aquaculture around the Korean Peninsula as large and dynamic enough to warrant high-precision monitoring and production estimation approaches, reinforcing that corporate-scale activity can be extensive and data-intensive. (Chen et al, 2025) These domestic policy drivers matter because they influence what data are prioritized, which agencies invest in monitoring capacity, and how precautionary obligations are operationalized in practice.

Framed this way, the core governance risk is not that BBNJ “fails to regulate corporations,” but that State obligations can become procedurally compliant yet substantively weak if the operator-facing layer is thin. Early BBNJ effectiveness will depend on whether Parties build domestic mechanisms that compel credible operator data for screening, assessment, monitoring, and publication through the Clearing-House, and whether those mechanisms remain robust when economic incentives pull in the opposite direction.

3.3 AI as a Transparency Tool

AI can help most where information is scattered, inconsistent, and expensive to review at scale. In this context, the practical role of AI is not enforcement, but transparency support. One high-value use case is natural language processing (NLP) that turns unstructured corporate text into structured signals: activity types, claimed impacts, risk language, mitigation promises, and references to monitoring or compliance.

This approach is already well established in adjacent domains. Recent work in Decision Support Systems proposes NLP models to quantify ESG-related corporate communication using large text corpora, which is directly relevant to parsing sustainability disclosures, annual reports, and policy documents. (Schimanski et al, 2024) Other NLP research has built information extraction systems designed to retrieve and standardize content from sustainability reports in line with reporting frameworks such as GRI, addressing the core problem that disclosures are hard to compare across firms. (Polignano et al, 2022) A further limitation is subjectivity and ambiguity in sustainability narratives; explainable NLP has been proposed as a way to reduce analyst burden and make model outputs more interpretable, with humans kept in the loop rather than replaced. (Ong et al, 2025)

Applied to BBNJ implementation and corporate ocean activities, an AI transparency workflow could look like Table 1 below.

Table 1. AI-assisted Transparency Workflow for Corporate Ocean Activities under the BBNJ Implementation

| Stage | Input Data | AI Function | Output | Governance Value |
|---|---|--|--|--|
| 1. Document ingestion and normalization | Sustainability reports, annual reports, compliance statements, sectoral policy docs, annex tables, scanned PDFs | Automated text ingestion and preprocessing | Standardized machine-readable corpus | Reduces fragmentation of publicly available information |
| 2. Domain entity and activity extraction | Normalized text and tables from Stage 1 | Maritime domain NER, relation and event extraction (who did what, where, when, with what intensity), geo-normalization | Structured identification of companies, vessels, activity types, and locations | Improves comparability across firms and sectors, supporting accountability analysis beyond generic narrative |

| | | | | |
|---|--|---|---|---|
| 3. Claim, mitigation, and risk language analysis | Extracted events, sections like “Sustainability,” “Risk,” “Strategy,” plus quantitative tables | Claim extraction and risk language detection | Identification of impact claims, mitigation measures, and omitted risks | Reduces information asymmetry by turning “PR-like text” into measurable commitments |
| 4. Cross-document consistency and discrepancy checks | Multi-year corporate disclosures | Temporal comparison and inconsistency detection | Flags unexplained changes or contradictions over time | Supports longitudinal review and helps regulators or civil society identify where deeper audit or clarification is needed |
| 5. Human-in-the-loop decision support outputs | All structured outputs above | Human-in-the-loop summarization and visualization | Searchable summaries and priority review lists | Assists regulators and the public without replacing legal judgment |

This can reduce information asymmetry between States, companies, and the public, especially when States must publish and manage more information through mechanisms like the BBNJ Clearing-House platform.

However, the boundary must be explicit. AI cannot enforce treaty duties, assign legal liability, or replace the state decision that authorizes an activity under jurisdiction or control. The Agreement’s structure makes Parties responsible for key decisions and reporting steps, so AI can support review and transparency, but it cannot substitute for legal authority or accountability.

4. Environmental Impact Assessment: Jurisdictional Ambiguity in ABNJ

4.1 Which EIA Law Applies?

A core implementation problem for EIA in ABNJ is that ABNJ governance is legally global, but operationally routed through States. Under the BBNJ Agreement, Parties must ensure that the potential impacts of planned activities in ABNJ that are “under their jurisdiction or control” are assessed before authorization. The Party whose jurisdiction or control covers the activity remains responsible for deciding whether it may proceed.

In practice, however, “jurisdiction or control” can point to more than one legal anchor at the same time: the flag State of a vessel, a sponsoring State in seabed-related activities, the State where a corporate actor is incorporated or headquartered, and potentially additional States if operational control is distributed across contractors and subcontractors. This becomes harder in ABNJ because activities and impacts are rarely confined to one legal compartment. Friedman (2024) highlights a

structural version of the same problem: the Agreement is often treated as a high seas treaty, but it also applies to the Area (the international seabed) (Friedman, 2024). The BBNJ institutional framework and the International Seabed Authority (ISA) have different competencies, yet they operate in the same geographic zone. Friedman (2024) argues that the BBNJ text does not meaningfully acknowledge the ISA or the “regime of the Area” referred to in the UN Convention on the Law of the Sea, reinforcing a legal separation between the high seas and the seabed and between living and non-living resources, even though these are interconnected in practice. This connectivity creates compliance and coordination challenges that a purely compartmentalized EIA approach can miss.

The BBNJ Agreement tries to manage this overlap through a relationship design rather than a single centralized EIA authority. For example, it explicitly anticipates that some EIAs will occur under other relevant legal instruments or bodies, but then requires publication of EIA reports through the Clearing-House Mechanism and leaves room for scientific and technical input. The result is not one clear answer to “which EIA law applies,” but a layered system in which the controlling Party must choose a pathway that is compatible with BBNJ thresholds, transparency expectations, and review functions.

4.2 Implications for the Effectiveness of EIA

This jurisdictional ambiguity matters because it affects whether EIA functions as a substantive safeguard or degrades into a formal requirement. The BBNJ Agreement sets a screening trigger when a planned activity may have more than a minor or transitory effect on the marine environment, or when effects are unknown or poorly understood, and it requires initial analysis that can include cumulative impacts. But the implementation burden still sits with the Party with jurisdiction or control, including determinations made at screening, scoping, and authorization.

Li & Zhang (2024) describe the central tension directly: the final agreement emphasizes State obligations to conduct EIA, but in doing so it also “provid[es] more discretion to states that control planned activities.” (Li & Zhang, 2024) They argue that the BBNJ negotiation history and broader international environmental law logic point toward “internationalization” of EIA in ABNJ, meaning a State-led system that is nevertheless subject to global oversight or guidance that restrains unilateral discretion. At the same time, they note that creating an independent body in charge of EIA is effectively impossible under prevailing sovereignty constraints, so internationalization must be pursued through guidance and oversight tools (such as standards, soft law, and participatory review).

If discretion is exercised unevenly, two risks follow. First, avoidance risk: an actor can seek the least demanding procedural route, especially where the relationship with sectoral regimes is invoked to argue that separate screening or assessment is unnecessary. Second, a minimum standard risk: if Parties interpret thresholds and evidentiary expectations differently, the system can drift toward a lowest-common-denominator practice, weakening the precautionary orientation that the Agreement otherwise embraces as a guiding principle. In that scenario, EIA may still generate documents, but it will struggle to deliver the core governance functions that ABNJ needs most: credible early warning, comparable assessments across sectors, and cumulative impact reasoning that is consistent enough to support cooperation across legal regimes.

4.3 AI-Supported EIA

AI can help mitigate some operational weaknesses in ABNJ EIA, but only if it is framed as a transparency and decision-support layer rather than as a decision-maker. This framing matches the

architecture of the BBNJ Agreement: the Party with jurisdiction or control makes the authorization decision, while transparency, notification, consultation, and scientific and technical input are strengthened through shared mechanisms and iterative review.

Within that structure, AI can be useful in three practical ways. First, it can support early risk screening and scoping by consolidating the best available science and structured evidence into a consistent template: summarizing known pressures, highlighting uncertainty, and surfacing where impacts may be “unknown or poorly understood,” which is directly relevant to the Agreement’s screening trigger. Second, it can improve procedural transparency by helping to standardize what gets published and compared: extracting key fields from EIA documents for publication, generating plain-language summaries for consultation, and mapping public comments to specific sections of a draft report in a way that is easier to audit. This aligns with the Agreement’s emphasis on public notification and consultation across the EIA process and publication through the Clearing-House Mechanism. Third, AI can help operationalize Li and Zhang’s “internationalization” logic by making guidance and oversight more usable at scale: for example, by supporting the consistent application of soft-law guidance and indicative activity lists, and by enabling systematic comparison of EIAs across activities and Parties without transferring legal authority away from States.

The limitations need to be explicit. Khan et al (2024) suggest a mixed picture: interview-based evidence reports potential benefits such as faster preliminary data collection and improved report structure, but also serious concerns about compromised data quality, weaker public involvement, increased plagiarism risk, and bias, with many experts expecting more threats than benefits if left ungoverned (Khan et al, 2024). This is why an AI-enabled workflow should be paired with an AI risk management approach that emphasizes documentation, transparency, and accountability. The National Institute of Standards and Technology highlights that AI systems can behave unpredictably as data and contexts change, can be difficult to interpret in complex settings, and should be managed through structured governance, measurement, and documentation to support trustworthy use. (National Institute of Standards and Technology, 2023)

Accordingly, in ABNJ EIA, AI should be treated as a tool for consistency and traceability. It can help organize evidence and expose gaps, but it cannot supply legal judgment, allocate responsibility, or replace the Party’s duty to decide whether an activity may proceed under its jurisdiction or control.

5. Discussion

Across the earlier sections, the paper has shown that the main barriers to effective BBNJ implementation are not only scientific uncertainty and missing data, but also the way responsibilities are distributed across States, sectoral regimes, and private operators. This matters for EIA in ABNJ because jurisdiction or control can be hard to operationalize in complex value chains, and because legal regimes that operate in the same geographic space can still pull in different directions.

5.1 Where AI Can Help In Practice

AI can improve data accessibility, especially for actors with limited staff and time. A realistic contribution is not producing new ocean observations, but lowering the friction of using what already exists by turning hard-to-search documents and scattered datasets into structured, review-ready information. This is especially relevant because the BBNJ implementation model relies heavily on documentation, transparency, and information sharing, including communication of EIA-related materials via a Clearing-House Mechanism, and it places strong emphasis on capacity building and

sharing marine technology and data in user-friendly formats.

AI can also help reduce monitoring and review costs when it is used as triage rather than as a decision-maker. In ABNJ settings where full surveys are expensive, AI-supported screening can help identify where risks are likely to be higher, where data gaps are unusually severe, and where assumptions are doing too much work in an assessment. This does not eliminate uncertainty, but it can make uncertainty more explicit and therefore harder to ignore during screening and scoping.

A third contribution is reducing information asymmetry. The paper has already argued that corporate-led activity often drives real-world pressure, while governance and reporting duties sit mainly with States. In that setting, NLP-style tools can help States and reviewers process corporate disclosures and public documents at scale and extract a comparable set of activity descriptions, risk statements, and mitigation claims. This supports more consistent review and helps smaller administrations participate more substantively, even when they cannot match the data pipelines of advanced economies.

5.2 Where AI Cannot Help

AI cannot allocate legal responsibility, decide jurisdiction, or resolve overlaps among legal regimes. These are institutional and legal questions, not prediction questions. The implementation challenge that Friedman (2024) highlights is a good example. The BBNJ Agreement is often discussed as a high seas instrument, but it also touches the Area, where the ISA already has a distinct mandate. That regime separation is not something AI can fix because the solution requires legal coordination, interpretation, and political agreement among States and institutions. Related interface questions also arise in fisheries governance. Diz (2024) notes that negotiations revealed divergent views on the interface between the BBNJ Agreement and Regional Fisheries Management Organisations (RFMO), and that what “not undermining” RFMO mandates means in practice is not clear or uniform. (Diz, 2024) This reinforces the point that resolving overlaps among regimes requires legal interpretation and institutional coordination, rather than algorithmic prediction.

AI also cannot solve the discretion problem that Li & Zhang (2024) emphasize. Even if AI makes screening faster, the core decisions about thresholds, scope, and the degree of internationalization of the review remain political and legal design questions. The BBNJ EIA system is state-led by necessity, and international oversight mechanisms have to be built through agreed procedures, guidance, and practice rather than delegated to a model.

Finally, AI cannot create political consensus. It can clarify options and make tradeoffs more visible, but it cannot substitute for agreement on standards, burden-sharing, or the distribution of benefits and costs. In ABNJ governance, those are often the real constraints.

5.3 Technology Dependence Risks and Policy Implications

There is a real risk that heavy reliance on AI could widen the gap between advanced economies and developing states. If AI systems are deployed without shared data governance and without capacity building, the actors who already have the best access to satellite products, compute, and specialized expertise will gain additional leverage in defining baselines, setting narratives about risk, and shaping what counts as adequate evidence.

The policy implication is that data governance and capacity building should come before, or at least alongside, AI adoption. This aligns with the BBNJ Agreement architecture as summarized in institutional guidance that highlights capacity building, sharing data and information, and making EIA

information publicly available through the Clearing-House Mechanism. It also aligns with widely used institutional guidance on responsible AI that stresses context sensitivity, real-world risk, documentation, and the need for governance processes around AI rather than blind trust in outputs.

A useful way to frame the UN Ocean Decade in this paper is as a practical coordination space where capacity development, shared infrastructure, and data availability can be accelerated through co-design and co-delivery across governments, researchers, and other stakeholders. The Vision 2030 work and related institutional roadmaps stress resources, infrastructure, partnerships, and capacity development as core requirements, which fits the argument that AI is a catalyst only when the underlying governance and capacity foundations exist. (Ocean Decade, 2024)

Table 2. What AI can and cannot do for early BBNJ implementation

| Theme | AI can do | AI cannot do |
|--|--|---|
| Data access | Organize scattered data and documents into usable evidence | Create long-term baselines where none exist |
| Monitoring effort | Triage and early risk screening to focus limited resources | Replace field observation and verification |
| Information asymmetry | Structure disclosures and reports into comparable signals | Guarantee truthfulness of disclosures |
| Jurisdiction and regime overlap | Support traceable documentation and comparisons | Decide jurisdiction or resolve overlaps |
| State discretion in EIA | Improve consistency through templates and checklists | Set binding thresholds or standards |
| Political agreement | Clarify options and tradeoffs | Produce consensus or allocate burdens |
| Technology dependence risk | Highlight gaps and uncertainty | Prevent inequality without capacity support |
| Policy implication | Support capacity building workflows | Substitute for data governance |
| Roles on Ocean Decade | Provide a testbed for shared tools and practices | Replace treaty institutions |

6. Conclusion

This paper has argued that the BBNJ implementation challenge is a structural problem created by

interacting constraints. ABNJ data gaps limit baselines and cumulative impact reasoning. National implementation requires cross-ministry coordination that is hard to sustain. Corporate activity can be a real-world driver of ecological pressure, while accountability is routed through States. EIA effectiveness is further weakened by jurisdictional ambiguity and by the co-existence of distinct legal regimes in the same space.

Within those constraints, AI can still be useful, but only with careful framing. AI can improve accessibility to existing information, reduce some monitoring and review costs through screening and prioritization, and reduce information asymmetry by structuring corporate and policy text into evidence that is easier to compare and audit. But AI cannot assign legal responsibility, decide jurisdiction, or produce political agreement on standards and oversight. The most credible pathway is therefore sequential. Build data governance and capacity first, then apply AI to make those foundations more usable at scale.

The UN Ocean Decade can be presented as a uniquely useful global experiment space for making BBNJ operational in practice, because it is already organized around co-designed actions, shared infrastructure needs, capacity development, and data and knowledge ecosystems. Using that space to surface implementation challenges early and to test workable transparency and capacity approaches may be one of the most valuable contributions in the first phase of BBNJ implementation.

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