

Deep Seabed Mining: Environmental Risks, Social Consequences, Responsible Governance

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Executive Summary

Case Snapshot

The rapid rise of Deep Seabed Mining (DSM) poses significant environmental, ethical, and institutional challenges. The International Seabed Authority (ISA) holds a dual mandate to develop seabed minerals and protect marine ecosystems, yet faces a deepening legitimacy crisis due to divergent views among states, scientists, and civil society.

Key Governance Gaps

- Legitimacy: Limited consensus and lack of support from important actors due to alleged decision-making deficiencies in the processes and data management.
- Accountability: Weak conflict-of-interest safeguards and oversight.
- Public Participation: Marginalization of Affected Communities and Observers.
- Precautionary Principle: Inconsistent application in licensing and impact assessments.
- Community exclusion: Coastal and Indigenous communities, as well as observers within ISA, feel excluded because of their non-binding status.

Target Audience

The target audiences of this brief are:

- ISA legislators, officers, and observers
- Activists advocating for a moratorium
- NGOs linked to DSM and extraction combat
- Scientists and researchers
- Hard-to-reach population: Coastal and Indigenous communities, and civil society observers within the ISA



Stakeholders & Social Dimensions

- **ISA's Assembly:** It is the body within the organisation in charge of handling the meetings and discussions surrounding DSM, giving voice to the states and observers to discuss the regulation and management of the marine seabed and everything that it contains (resources, lifeforms, etc). As the body responsible for establishing the policies for DSM, the ISA Assembly is positioned to make community inclusion and the precautionary principle a reality. The ISA Assembly is essential to the intended transformation.
- **NGOs and coalitions (Te Ipukarea Society, Deep Sea Conservation Coalition, Alianza, WWF, etc.):** These organisations undertake the challenging work of environmental advocacy and offering guidance on DSM. They are at the forefront of supporting the precautionary principle and promoting moratoriums designed to delay or halt DSM before approval, ensuring its potentially irreversible impacts are prevented.
- **Indigenous and Coastal Communities (primarily in the Western Pacific):** They are the most vulnerable actors to the potential impacts of DSM. They could either benefit greatly (though that's highly questionable) or be negatively affected by the approval of mining operations on the marine international seabed. In an equitable process, Indigenous and Coastal communities must be included in the discussion without complaint (with a binding voice in the matter), and they must be consulted before any extraction process is approved.



Solutions & Recommendations

Structural Reforms to ISA's Assembly meetings

Empower Observers: Transform observer status into formal participation with voting rights and previous consultation regarding any intended regulatory decisions.

Institutionalize Scientific Input: Embed scientists, Indigenous knowledge holders, and civil society into the ISA's research and review processes.

Legal Foundations:

- United Nations Convention on the Law of the Sea (UNCLOS) Article 143: Mandates ISA to promote marine scientific research
- Common Heritage Principle: Requires inclusive governance and equitable benefit-sharing
- Annex III – Precautionary Principle: Demands proactive risk management when facing potential environmental harm

External Pressure via Legal and Civic Channels

Moratoriums & Dispute Resolution: Leverage International Tribunal for the Law of the Sea (ITLOS) and UNCLOS to challenge unsafe or unjustified processes.

Public Mobilization: Use platforms like Avaaz.org or Change.org to amplify community and scientific dissent, especially when safety and necessity are contested.

Workshop / Track 1.5 dialogues

Making an in-person event that lasts for four to five days, in which representatives of each stakeholder group (50-70 assistants) can exchange perspectives and interests around the sea and the potential approval of DSM. This aims to foster mutual understanding, to humanize one another, and to move beyond the antagonistic perceptions they currently hold.

A multi-stakeholder dialogue process—modelled on track 1.5 diplomacy, which brings together officials and experts in a semi-official setting to enable sensitive discussions, idea-sharing, and trust-building—is designed to support the governance of deep-seabed mining. Convened in parallel with the formal ISA negotiations, this process emphasises deep listening, narrative exchange, and the co-creation of shared principles and practical mechanisms.



It is important for this to happen under Chatham House Rules. The Chatham House Rule is a principle for meetings where participants can use the information shared, but they are not allowed to reveal the identity or affiliation of the speaker.

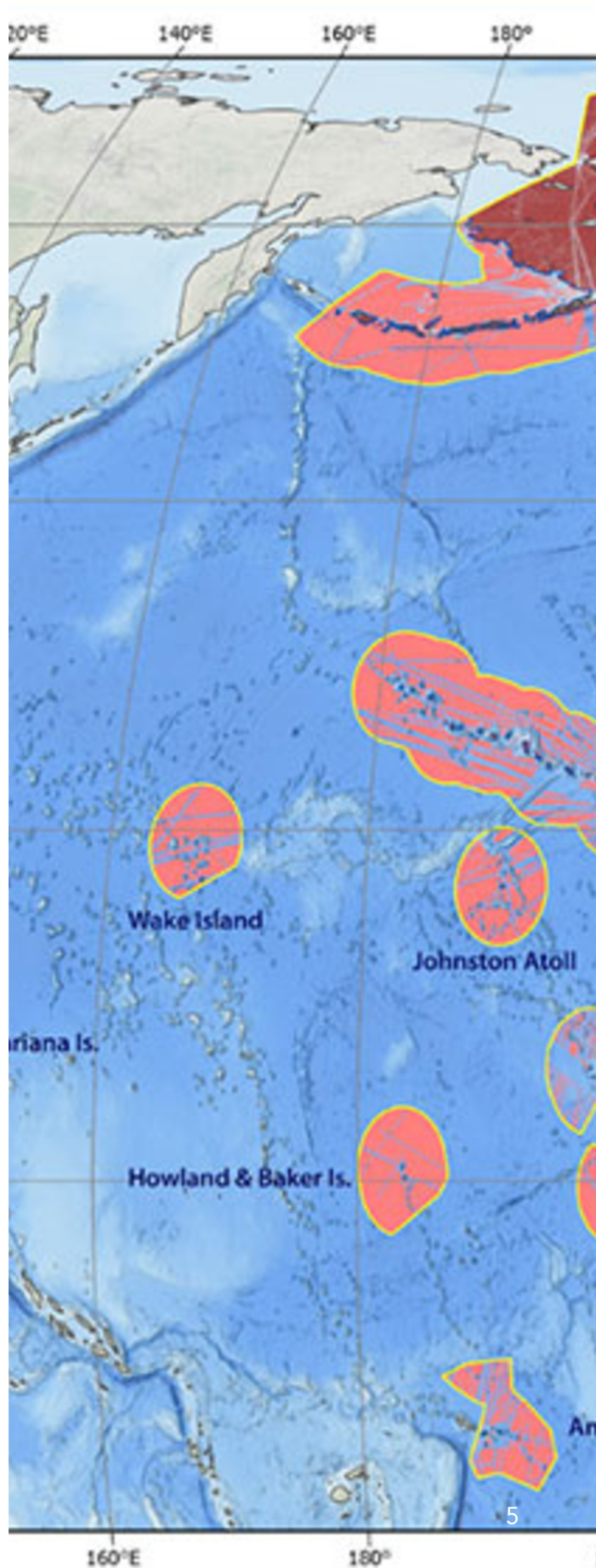
Organizing the workshop presents challenges of trust and legitimacy: While the International Seabed Authority (ISA) could host, its lack of transparency may deter stakeholders. Universities offer neutrality but few are directly engaged in this niche decision-making, though institutions like Cape Town, the University for Peace, UBC, or Notre Dame could be viable candidates. NGOs have organizing capacity but risk being perceived as activist-driven.

A promising solution is a mixed model where ISA provides the venue (outside Jamaica) and ensures participation of officials and companies, academia designs the methodology to foster connections, and NGOs act as guarantors of community inclusion, thereby balancing credibility, expertise, and accountability.

Deep Dive: Context & Political Fit

United Nations Convention on the Law of the Sea (UNCLOS) & the Common Heritage of Humankind

The seabed beyond 200 nautical miles ("the Area") is declared a shared global resource. Part XI mandates that any exploitation must benefit all humanity and protect marine ecosystems.





International Seabed Authority (ISA)

Established by UNCLOS to oversee seabed mining and composed of:

- Assembly (168 States): approves rules and budget.
- Council (36 members): drafts Mining Code, grants licenses.
- Legal-Technical Commission: prepares regulations.

Current status: Thirty-one exploration contracts approved; exploitation pending finalisation of the Mining Code.

Regulatory and Political Tensions

The Nauru Rule & Legitimacy Crisis: In 2021, Nauru triggered the "Two-Year Rule" to finalize the Exploitation Code by 2023. The deadline passed without resolution, raising concerns about ISA's credibility.

Precautionary Principle (Annexe III): Requires caution in the face of serious or irreversible environmental risks. Less than 0.01% of the seabed has been studied, amplifying ecological uncertainty.

Sustainable Development Goals:

- SDG 14: Protect marine life and ensure sustainable use.
- SDG 16.6 & 16.7: Promote transparent, inclusive, and participatory institutions.

Political and Ethical Implications

Stakeholder Conflicts: Thirty-two States, NGOs, and corporations (e.g., Volvo, Samsung) support a moratorium pending better data and regulation. ISA faces criticism for a lack of transparency and conflicts of interest.

Marginalization of Communities: No legal requirement for Free, Prior, and Informed Consent (FPIC). Indigenous and local communities lack formal influence, relying on sponsoring States for representation.

Geostrategic Pressures: Global race for critical metals (cobalt, nickel, rare earths) for energy transition. The Clarion-Clipperton Zone (CCZ) is estimated at US\$18 billion in mineral value.

Litigation and National Pushback: Cases like Solwara 1 and moratoriums in Vanuatu and Fiji show national resistance. Disputes may escalate to ITLOS, reflecting civil society's distrust in ISA governance.



Deep Dive: Feasibility and Implementation

Structural Reforms

- Grant observers (scientists, Indigenous leaders, civil society) formal voting and review rights.
- Align with UNCLOS Article 143 by institutionalising inclusive scientific participation.
- Operationalise the "common heritage of humankind" through equitable governance and benefit-sharing.
- Apply the precautionary principle via continuous stakeholder monitoring (UNCLOS Annex III).
- Fulfill SDG 16.7 by creating participatory, transparent decision-making structures in which NGOs, community representatives, and ISA officers can directly interact and cooperate in the creation of integrative policies and legislation.

The reform recommendations need some institutional backing in both UNCLOS and in the Mining Code Draft, where certain obligations and more concise participation mechanisms are established to ensure the involvement of communities and other actors in an "extended peer community" (EPC). This should enhance decision-making in complex, high-stakes contexts by integrating diverse forms of knowledge—including scientific expertise, Indigenous perspectives, and lived experience—especially when facts are uncertain, values are disputed, and time is limited (just as it happens with the current discussion around DSM on international waters).

Moratorium Until Robust Science & Regulation

Thirty-two states are calling for a moratorium, alongside leading NGOs, scientists, and even companies like Volvo and Samsung. Interviewed stakeholders agree that commercial exploitation should not proceed under current conditions until ecological data and rules exist.

Risk of Litigation and National Moratoriums

Currently, 32 states, supported by NGOs, scientists, and companies such as Volvo and Samsung, are calling for a moratorium on deep-sea mining, stressing that exploitation should not proceed until sufficient ecological data and clear rules are established. Experiences like the failed Solwara 1 project in Papua New Guinea and moratoriums in Vanuatu and Fiji demonstrate how disputes can spill beyond the International Seabed Authority (ISA) into national courts or the International Tribunal for the Law of the Sea (ITLOS), reflecting civil society pressure and distrust in international governance.

These dynamics underscore the urgency of either reforming ISA's mechanisms of participation to ensure meaningful stakeholder involvement or prolonging the moratorium to allow time for better scientific understanding of the seabed and the potential impacts of polymetallic nodule extraction.

Urgency to Bind Observers into Decision-Making

The current framework of the International Seabed Authority (ISA) excludes communities and observers from meaningful participation: states face no obligation to consult or secure free, prior, and informed consent (FPIC), and observers lack voting rights or influence, with little transparency on whether their input is considered. To ensure accountability and protect submarine ecosystems, reforms must grant binding status to communities and observers, institutionalise their right to protest harmful decisions, and create mechanisms beyond lobbying, such as formal channels for input and transparent reporting, to embed genuine community involvement in deep-sea governance.

Financial Considerations

Structural Reforms: The reform recommendations need institutional backing in both UNCLOS and in the Mining Code Draft to ensure the involvement of communities and other actors.

Workshop / Track 1.5 Dialogues: The event should secure sponsors who are invested in creating a space where these actors can connect. The primary financial commitments would cover participants' flights, accommodation, and meals, along with audio equipment and other minor expenses. Beyond these, the venue, activities, and additional requirements could be provided by the organising institution or institutions.



Conclusion

Deep-sea mining raises a central question for the international community: whether the promise of the “common heritage of humankind” can be upheld when ecological uncertainty, commercial pressure, and unequal participation in decision-making converge. This brief shows that the challenge is not only technical, but also one of legitimacy, transparency, and justice. Beyond environmental uncertainty, it is crucial to ensure that decisions concerning the deep seabed are made through inclusive and equitable processes rather than being shaped by a limited set of political and commercial interests. Scientific knowledge remains limited, while potential harms—habitat destruction, sediment plumes, impacts on fisheries, and cultural disruption for coastal and Indigenous communities—may be irreversible. In this context, the precautionary principle should guide all regulatory decisions.

The ISA will continue to be an essential forum for global negotiation, but transparency alone is not enough. Meaningful governance requires accountability mechanisms, independent scientific input, enforceable safeguards, and participation structures that grant affected communities more than a symbolic role. In particular, coastal and Indigenous communities, whose identities, livelihoods, and spiritual relationships with the ocean may be disrupted, must be consulted through accessible and publicly documented processes.

Commercial exploitation should not proceed until scientific, institutional, and social gaps are fully addressed. A robust moratorium would provide the necessary window to strengthen regulations and rebuild trust, using that time to convene an inclusive, multi-stakeholder workshop aimed at developing governance mechanisms capable of safeguarding the precautionary principle. Ultimately, if the deep seabed is truly the common heritage of humankind, its future must be guided by justice, shared responsibility, and a collective commitment to protect the ocean as a living system rather than by narrow economic interests.





This work builds on the 2024-25 Reach research report, "[Building Ethical Practices and Community Involvement in Deep Sea Mining: A Human Rights-Based Approach for Sustainable Development](#)," by Ana Elena Fierro Ferráez, Julia Guzmán Gutiérrez, Santiago Colín Núñez, Sofía Villegas Pérez, Emiliano Bondani Rahme, and all the impactful partners, community members, and mentors involved in the research.

As part of the "Pathways from Evidence to Action" series, inspired by the African Center for Equitable Development (ACED), the Reach Alliance challenged researchers to identify connections, address gaps, and develop recommendations grounded in their findings. The series comprises thirteen briefing notes developing solutions for urgent climate, public health, and economic challenges and engages practitioners and policymakers in advancing pathways to implementation.

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