



## Briefing Paper

### **A Call for Pacific Island Governments to support a Moratorium on Deep Sea Mining (DSM) in the Area – Focusing on the Clarion-Clipperton Zone (CCZ)**

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#### **Introduction**

Deep Sea Mining (DSM) is a growing concern worldwide but also specifically in the Pacific region, where vulnerable ecosystems would be at significant risk from large-scale mineral extraction. The Clarion-Clipperton Zone (CCZ), located in international waters between Hawaii, Kiribati and Mexico, is of great interest to mining companies due to its deposits of small rocks - polymetallic nodules. However, its high biodiversity and the ecological roles played by this deep sea ecosystem in the health of the wider marine environment and for the planet is only starting to be understood. But even under the current state of limited scientific knowledge, it is already obvious to scientists that mining activities threaten to pose irreversible and irreparable harm.

The Pacific island nations of Nauru, Tonga, the Cook Islands, and Kiribati hold sponsorship contracts with mining companies for DSM exploration in the CCZ. Nauru, Tonga, and Kiribati have entered into arrangements with The Metals Company - granting this single foreign entity and its investors access to vast swathes of Pacific ocean floor. Commercial-scale DSM has not begun, but this company plans to seek approval from the ISA Member States as early as June 2025 despite the fact that regulations governing the extraction of these resources remain absent.

This briefing paper argues that the risks of DSM outweigh any potential benefits, particularly when it comes to protecting the environment, ecosystem services, local communities, cultural values and key existing economic resources in the region. The benefits of DSM are speculative, and conversely, real adverse harm may result for existing income earning sectors such as fisheries and tourism (for example see *All that Glitters is Not Gold* [‘White Paper’](#) presented to

Tongan parliament and royal family). In addition, it is unclear whether sponsoring nations may have to bear liabilities for environmental damages should pollution from their DSM activities affect the water quality of other Pacific island Countries.

Globally and in the region, the deep sea mining industry lacks social license and has been rejected by many [Nation States & territorial jurisdictions](#), the [scientific community](#), indigenous peoples, environmental NGOs, [global businesses \(including major banks and insurers\)](#), policy makers and [high-ranking UN officials](#).

**We encourage Pacific Leaders to prioritise the sustainability of the ocean and the livelihood of their societies on which they rely.**

## **1. The Legal Framework And Governance of DSM in the Pacific Ocean (CCZ)**

The [International Seabed Authority \(ISA\)](#) was established under the United Nations Convention on the Law of the Sea (UNCLOS) to regulate DSM activities in the international seabed, known as "The Area" (i.e., the seabed and ocean floor beyond national jurisdiction, including the CCZ). Under UNCLOS and the 1994 Agreement relating to the Implementation of Part XI of UNCLOS, the ISA has the power to issue licenses for the exploration and exploitation of mineral resources in the Area. To date the ISA has issued a total of [31 exploration contracts](#), including [17 in the CCZ](#) and [6 in the Western Pacific Ocean](#). However, the ISA and its member States are also bound by obligations to protect the marine environment and ensure that mining does not lead to harmful environmental impacts. In other words, if the effective protection of the marine environment cannot be ensured, mining activities should not occur.

Under UNCLOS, the Area and its resources are designated the [Common Heritage of Humankind](#). Therefore the ISA acts on behalf of humanity and all activities in the Area must benefit humankind as a whole. It is important to stress, in this regard, that mining should not occur if only some stand to benefit while others are forced to bear the burdens of extraction.

While no commercial exploitation has commenced, the regulatory framework for exploitation has been under negotiation for years by the ISA's member States. Numerous important issues remain unresolved and due to the complexity of the negotiations and the divergence of views in key areas, policy experts say [the regulatory framework is still years from being finalised](#). It is noteworthy that the finalisation of the regulations requires provisional adoption by the Council and subsequent approval by all members of the Assembly. The final decision will be made by consensus and is not up to individual states.

The ISA also suffers from significant institutional and governance flaws. For example, lack of transparency, built-in-conflicts of interest, decision-making rules which favour mining interests and no ability for parties, other than the mining companies, to appeal decisions.

## 2. Marine Minerals in the Pacific and CCZ

The CCZ's seafloor is a patchwork of exploration licences due to the presence of rocks known as polymetallic nodules. These take millions of years to form and once mined are effectively gone forever. The nodules sit on thick soft mud and provide the only hard surfaces for organisms to attach to. They provide breeding and feeding grounds for the unique life forms of the deep. The microorganisms on and surrounding the nodules process organic matter that falls from the sea above them and lock away carbon in the seabed. It is still unknown what will happen when DSM disrupts the seabed and this cycle.

The nodules contain minerals such as manganese, nickel, copper, and cobalt. Proponents have argued some of these are essential for clean energy technologies, including batteries for electric vehicles and renewable energy infrastructure. However, these technologies are rapidly evolving and already many EV batteries on the market do not require the metals.

Contrary to false narratives, mining the deep seabed will not reduce or alleviate terrestrial mining. Moreover, extracting these minerals is not a prerequisite for the 'green transition' (as opposed to investing in a circular economy) and their mining would come with enormous environmental costs. Instead, DSM companies are attempting to pivot to military and other strategic uses as a market for deep-sea minerals.

## 3. Science and Knowledge Gaps

The regulatory framework for DSM is being developed in the context of a severe lack of environmental baselines and scientific understanding of deep sea ecosystems. Scientists and policy experts broadly agree that [“current scientific knowledge is too sparse to ensure the protection of the marine environment from the impacts of deep-seabed mining.”](#) And that with a concerted deep-sea scientific research effort it would take a few decades to fill the knowledge gaps required to make evidence-based decisions about DSM.

Research on the impacts of DSM has revealed alarming risks. The scientific consensus is that the impacts of DSM will be severe and essentially irreversible in human timeframes (see 'Harmful Marine Extractives: Understanding the risks & impacts of financing non-renewable extractive industries / Deep- Sea Mining,' UNEP Finance Initiative, Geneva (2022); A. Chin and K. Hari, [“Predicting the impacts of mining of deep sea polymetallic nodules in the Pacific Ocean: A Review of Scientific Literature,”](#) (May 2020)

- **Biodiversity Loss:** The CCZ is one of the most biologically diverse deep-sea areas, home to organisms that have adapted to extreme conditions over millions of years. Mining threatens to destroy these ecosystems and delicate habitats before we even fully understand them, which serve as vital carbon sinks and support biodiversity.

- **Pollution from Plumes:** Mining activities would stir up sediment that can smother marine life, and carry toxic metals and radioactive alpha particles. The heavy sediment would settle but lighter particles from discharge plumes would be able to travel many kilometres. Waste water from rinsing nodules will be discharged at a depth of around 1 kilometre and discharge plumes could spread over great distances. [Modeling](#) independent of the DSM industry [predicts](#) that it would take only three months for sediment particles discharged in TMC's Tonga licence area to reach the waters of Kiribati and Hawaii with unknown consequences (@ 11-13.30 min)
- **Dredging the seabed :** The enormous mining machinery that companies like TMC and GSR plan to deploy would crush and destroy everything in their path. The science based visual investigation [Blue Peril](#) (@ 9- 10 min) predicts that 1 year of mining in TMC's Nauru licence area (NORI D) could destroy up to 600 km<sup>2</sup> of seabed. A single mining operation over a 30 year contract period could destroy an area of seabed similar to the land area of the whole of Hawai'i. In practice licence contracts may be extended to 50 - 60 years.
- **Noise:** DSM will cause noise which is harmful to marine species including marine mammals and is likely to disrupt dolphin and whale populations in particular.
- **Lack of Data:** Despite a slowly growing body of research, the deep-sea environment remains largely uncharted. Many species in the CCZ have yet to be discovered, and our understanding of the ecological effects of mining is limited. We do not yet have the information we need about the effects of DSM or even sufficient baseline data about the species present and deep sea ecological conditions to enable the environmental management of DSM . Without more science moving forward with DSM would be reckless.

#### 4. Environmental Management: Inadequate Protection

The environmental management of DSM in the CCZ is a major concern. The ISA is working to develop mining regulations. These would include mandatory environmental impact assessments (EIAs) and establishing areas to be protected from mining. However, the effectiveness of these measures is questionable:

- **Weak Enforcement:** The ISA lacks the resources and the political backing to properly enforce its rules. DSM operations are often located in remote areas and involve multiple jurisdictions, making oversight difficult and compliance harder to monitor.
- **Inability to amend contracts:** UNCLOS provides (Article 153(3), Annex Art. 19(2)) that contracts can only be amended with the consent of the contractor. This also means that regulations cannot be amended and then applied to existing contracts.
- **No appeal:** A recommendation by the Legal and Technical Commission for a plan of work can only be disapproved by the Council by a near-impossible vote of not only  $\frac{2}{3}$  of all voting Council members but by a majority in each of all four 'Chambers'. So if the LTC

makes an incorrect decision, or a decision otherwise in breach of the regulations, it in practice cannot be altered. Contractors can take a case to the International Tribunal for the Law of the Sea (ITLOS) (Art 187; 1994 Agreement Section 3 Paragraph 12); stakeholders cannot.

- **Insufficient Protections:** While the idea of protected areas has been suggested, they have not been adequately implemented or monitored and they do not represent a viable solution to the net biodiversity loss resulting from mining. In fact, it would appear from current practice that primarily areas that are of lesser commercial interest (due to low quality minerals or lesser abundance) would be spared from extraction targets, and not areas that actually deserve protection (which would be open to mining). The sheer scale of the mining operations, combined with the lack of baseline environmental data, means that we may not even know the full extent of the damage until it's too late.
- **Irreversible Damage:** The scientific consensus is that the potential for irreversible environmental harm from DSM remains a serious threat. Given the vulnerability of deep-sea ecosystems, it's likely that mining will lead to permanent loss of biodiversity and disruption to marine food webs.

## 5. Sociocultural Impact on Pacific Communities

The sociocultural impact of DSM on Pacific island nations cannot be ignored. Many of these nations depend on healthy oceans for their cultural identity, as well as for subsistence and commercial fishing, tourism, and other ocean-based livelihoods.

- **Cultural Connection to the Ocean:** For many Pacific communities, the ocean is not just a source of food but also a vital part of their cultural heritage. The introduction of DSM threatens to disrupt traditional relationships with the sea and undermine indigenous governance systems.
- **A threat to Livelihoods:** The destruction of marine ecosystems would directly affect Pacific island nations economic lifelines that depend on fishing and tourism. Marine life forms the foundation of entire economies, and the loss of biodiversity could result in devastating socioeconomic consequences. Due to climate change, the distribution of the three main tropical tuna species is expected to increasingly overlap with the CCZ. This could make Pacific tuna stocks more susceptible to the impacts of deep sea mining. Countries such as Samoa or the Cook Islands that have 20% or more of their RFMO catch derived from a potential deep sea mining area.
- **Growing Public Opposition:** Across the region, there is increasing opposition to DSM from civil society organizations, youth groups, religious and other indigenous communities. These groups are raising awareness about the potential impacts of DSM, urging leaders to take a stand and protect the Pacific's marine environment.

## 6. Economic Considerations for DSM

While DSM has long been framed as an economic opportunity, especially for nations involved in the mining activities, when looked at comprehensively the overall economic picture is far more complicated, full of uncertainty and the implications suggest the industry is high risk, low reward. Indeed, it seems apparent that only a handful would stand to benefit (if at all) while most others would be left to bear the burdens of extraction. Assessments of potential economic gains from DSM must be balanced with informed assessments on the associated losses of value that would accrue through environmental damages, losses in ecosystem services and **risks to existing industries**, such as **fishing**, and as yet undeveloped economic activities such as **Marine Genetic Resources (MGR's)**.

- **Cost Benefit Analysis:** The economic costs of DSM are currently unknown. In 2022 the ISA Council called for reporting on the economic value of ecosystem services and the potential loss of this value through potential exploitation activities in the Area. The purpose of the exercise would be to inform the design of '**polluter pays**' mechanisms, or to 'internalise' the 'external' costs of mining activities. The ensuing [report in May 2023](#) was **unable to place values on deep-sea ecosystem services due to the very limited data currently available**. The report did highlight that "seabed habitats in the Area are recognised to provide a broad range of ecosystem services." Including some "**key ecosystem services that are of potentially high economic value**".
- **Uncertain Economic Benefits:** The financial benefits of DSM are speculative, and the economic returns from mineral extraction are uncertain and may not outweigh the costs of potential environmental degradation, loss of biodiversity, and damage to existing marine-based industries.
- **Alternative Sustainable Economies:** Pacific island nations are already beginning to focus on alternative, sustainable forms of income, such as ecotourism, marine conservation, and sustainable fisheries. These industries offer long-term economic stability and can generate revenue without risking the environment.
- **Fair Distribution of Benefits:** Even if DSM yields economic benefits, there is a risk that the revenues will not be fairly distributed. Large corporations and powerful international players could capture most of the profits, leaving Pacific island nations with minimal economic gains.

## 7. Current DSM Activities in the CCZ

At present, the Pacific island nations of Nauru, Tonga, Kiribati and the Cook Islands, hold exploration contracts in the CCZ, along with a dozen other exploration contracts held by many of the largest nations in the world. While exploration activities are ongoing, including test mining, no commercial mining has yet begun.

Multiple mining tests of mining equipment are lined up for the next 18 months and commercial entities are applying more and more pressure on the ISA to hurry up and finish regulations so that mining can begin. Draft regulations currently envision a duration of 30 years for initial exploitation contracts with automatic 10-year renewals and very little scope for regulatory and enforcement interventions.

The triggering of the '2-year rule' by Nauru on behalf of its contractor, Nauru Ocean Resources Inc. (NORI) in June 2021, during the Covid-19 pandemic, placed all ISA members under great pressure to complete negotiations on the exploitation regulations within 2 years (an impossible task) so that NORI could submit its mining exploitation application, known as a 'plan of work', for [consideration even in the absence of agreed regulations](#). Nearly four years later, the regulations remain far from complete and in November 2024 Nauru notified the ISA Council President that NORI intends to submit its plan of work on June 27th, 2025. **This extraordinary step was taken in full knowledge that there is no regulatory framework for exploitation and won't be for several years, at best.**

The ISA Council has previously adopted a decision indicating that mining exploitation would not be permitted in the absence of adopted regulations. Nauru's November letter requested an agenda item to discuss how an application would be processed during the ISA Council meeting in March 2025.

Given the ISA's institutional biases favouring the granting of contracts, this very recent development, presents an extreme risk that large-scale commercial deep sea mining could be greenlit within the next year. Once one contract is granted, the floodgates would be open, ushering in a decades-long era of environmental destruction, unprecedented in scale and scope, in the Pacific ocean.

## 8. Recommendations for Pacific Leaders

Given the known environmental harm, the absence of an environmental baseline, the economic risks and uncertain financial gains, we present the following for consideration by Pacific leaders in relation to DSM :

- **Support a Global Moratorium on DSM:** Advocate at the ISA and relevant international platforms for a global moratorium on DSM, which is [legally permissible under international law and in conformity with UNCLOS](#). Encourage other nations to advocate for a moratorium.
- **Withdraw from Sponsorship of DSM:** Commit to not sponsoring exploitation activities until there is sufficient scientific understanding of the risks of DSM and a social license to operate, and to [not be swayed by threats of litigation by mining companies](#) as there is very little credibility behind such threats.
- **Regional Collaboration:** Pacific island nations to foster and share marine research, coordinate policies, and present a unified stance on a DSM moratorium at international forums using appropriate regional mechanisms.

- **Public participation in DSM decision-making:** Creating the best policy outcomes by actively involving the local communities and the wider public in the decision-making processes regarding DSM including allowing them to bring independent scientific evidence and having open decision-making processes is essential.
- **Support for Sustainable Alternatives:** Invest in initiatives that will ensure sustainable long-term resilience of the ocean and economies such as marine scientific research, developing marine genetic resources, ocean conservation, sustainable fisheries management, and marine based ecotourism.
- **Closely collaborate with the forthcoming BBNJ Secretariat** to promote the objectives of the BBNJ Agreement including conservation of marine biodiversity, capacity building and access to and benefit sharing of marine genetic resources.

## 9. Conclusion

Numerous scientific studies confirm what Pacific peoples have always known: that the deep ocean seabed is not a barren ecological wasteland, but rather an area of unique and substantial biodiversity that is interconnected with other ocean realms.

[Scientific investigations](#) predict that DSM would destroy seabed ecosystems, while plumes of sediment potentially carrying radioactive particles and metals could poison marine food chains and harm human health. DSM may also worsen climate change by releasing carbon stored in the deep seabed and disturbing natural sequestration processes

The Pacific Islands Forum has raised concerns about DSM and in 2022 at the UN Oceans Conference in Lisbon, Palau and Fiji launched an alliance of countries supporting a moratorium in international waters, supported by Samoa and Federated States of Micronesia shortly after. The political movement to pause the greenlighting of DSM now has the support of at least 32 countries including the Melanesian Spearhead Group declaration in 2023.

The case for putting the brakes on DSM in the Pacific and the CCZ is clear. The environmental, cultural, and economic risks are too high, and the long-term consequences of destructive mining practices could be irreversible. Pacific leaders must take a strong stance to protect the region's oceans and their unique ecosystems. A global moratorium on DSM, coupled with the promotion of sustainable alternatives, would ensure that the Pacific's marine resources and wealth are preserved for future generations.