Precautionary Management of Deep Sea Mining Potential in Pacific Island Countries
The existence of mineral deposits on the ocean floor has been known since as early as 1870, however, only since the 1970s has exploration of the deeper sea floor indicated that metallic minerals could be spread across large sections of the Pacific region, leading to a very new industry characterized as Deep Sea Mining.

To date, three main kinds of deep sea minerals have been identified across the Pacific region:

1. Hydro-thermal vents: in the waters of Fiji, PNG, Solomon Islands, Tonga and Vanuatu.
2. Polymetallic manganese nodules: in the waters of Cook Islands and Kiribati, and to a lesser extent in Niue and Tuvalu.

Improved technologies and the commodity super-cycle, have created strong investor interest in deep sea mining. Many countries have granted exploration permits to try and understand this new resource potential. Globally, over 1.5 million km² of the ocean floor have been granted licenses for exploration, despite a general weakness of regulatory and institutional capacities, and the environmental and social impacts yet to be fully understood.

The Pacific Possible: Precautionary Management of Deep Sea Mining Potential in Pacific Island Countries is a stocktaking exercise, highlighting the knowns and unknowns of this growing industry.

**What is the opportunity?**

- Exploration of ocean minerals and resources is increasing globally, requiring regulatory and institutional capacities to catch up.
- While the potential revenue for countries with deep sea minerals may be sizeable in some cases, the costs and risks involved remain unclear.
- The Pacific Possible: Precautionary Management of Deep Sea Mining Potential in Pacific Island Countries paper is a stocktaking exercise, highlighting the knowns and unknowns of this growing industry.

**BACKGROUND**

The existence of mineral deposits on the ocean floor has been known since as early as 1870, however, only since the 1970s has exploration of the deeper sea floor indicated that metallic minerals could be spread across large sections of the Pacific region, leading to a very new industry characterized as Deep Sea Mining.

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**CURRENT SITUATION**

To date, Fiji, Papua New Guinea, Solomon Islands, Tonga and Vanuatu have granted deep sea mining exploration permits, and the Cook Islands is part-way through a minerals exploration tender process. PNG is currently the only country in the Pacific region to have granted a license to mine, through the Solwara 1 Project.

**Some Knowns, Many Unknowns**

Key to understanding the potential of deep sea mining is:

- Understanding the extent and quality of mineral resources.
- Identifying the value of the minerals given varying prices and the technology available.
- Deducting the capital and operating costs.
- Determining the social and environmental impacts.
- Understanding how possible returns could be shared among stakeholders.

**Environmental Risks**

There are numerous environmental risks associated with deep sea mining. How would these activities impact the ecosystems and existing biodiversity at these depths? Given our oceans are not well understood or explored at these depths, is there the risk of causing irreversible damage? For Pacific Island countries, and the world at large, potential damage through destruction of ocean floor habitats at the mining site, sediment and discharge water plumes, noise, and pollution through accidental spills and leakages, is a major concern and has the potential to also impact related activities such as fisheries.

**Social Risks**

Concerns range from impact on livelihoods (fisheries, tourism, and transportation), cultural values, future use value of genetic resources, or the existence of unique species living in these parts of the ocean. Surveys of Pacific Islander concerns reflect experiences with terrestrial mining in the region.
The Outlook

Governance is Key

Economic benefits from terrestrial mining vary greatly across countries. There are numerous examples of negative outcomes resulting from the failure of governments to convert mineral endowment into sustained forms of economic activity. Public sector governance may well be the key determinant of the extent to which mineral exploitation is economically, politically, socially, and environmentally viable.

Key requirements for strengthened sector governance include:

- Good management to ensure efficient and effective exploitation under strong social and environmental performance.
- Good tax design to ensure appropriate government revenue and adequate incentives for investors.
- Good revenue administration to ensure revenue is collected.
- Good public expenditure management to ensure volatile and temporary natural resource revenue translates to permanent benefits for the nation and to manage the risk that resource wealth poses to the wider economy.

How can this be realized?

Given the Uncertainties apply the Precautionary Principle

Adopted by the 1992 Rio Convention, this approach states that “if an action or policy has suspected risk of causing harm to the public or environment ... the burden of proof that it is not harmful falls on those taking an action”.

The Pacific Community (SPC) has laid out an iterative and continuous process of five steps to applying the precautionary principle to deep sea mining:

**STEP 1**
Are precautionary measures needed?

**STEP 2**
Determine the degree of precaution needed.

**STEP 3**
What precautionary measures can be applied?
The paper lays out six management options, including no-development.

**STEP 4**
What precautionary measure can be taken?
A decision should be made in light of capacity issues, economic and social costs and relative risks involved.

**STEP 5**
Implementation and monitoring.
Throughout the steps, stakeholder participation is seen as a fundamental process involving a range of stakeholders including affected communities.

“GIVEN THE UNCERTAINTIES, APPLY THE PRECAUTIONARY PRINCIPLE.”
Pacific Island countries face unique development challenges. They are far away from major markets, often with small populations spread across many islands and vast distances, and are at the forefront of climate change and its impacts. Because of this, much research has focused on the challenges and constraints faced by Pacific Island countries, and finding ways to respond to these.

This paper is one part of the Pacific Possible series, which takes a positive focus, looking at genuinely transformative opportunities that exist for Pacific Island countries over the next 25 years and identifies the region’s biggest challenges that require urgent action.

Realizing these opportunities will often require collaboration not only between Pacific Island Governments, but also with neighbouring countries on the Pacific Rim. The findings presented in Pacific Possible will provide governments and policy-makers with specific insights into what each area could mean for the economy, for employment, for government income and spending.

To learn more, visit www.worldbank.org/PacificPossible, or join the conversation online with the hashtag #PacificPossible.