

BIOPROSPECTING, BIOTECHNOLOGY AND MARINE GENETIC RESOURCES



KEY POINTS

- Pacific island states strongly support ocean conservation, marine life regeneration, and sustainable management.
- Access and benefit-sharing (ABS) require institutional, technical, and financial support.
- The use of marine resources by multiple nations and investors requires national frameworks and management measures for areas beyond national jurisdiction (ABNJ).

HOW ISSUE LINKS TO/IMPACTS SDGs BEYOND **SDG14 LIFE BELOW WATER**

- SDG1: sustainable use of extractive and genetic resources can be an important component of local and regional poverty reduction, particularly upon benefit-sharing
- SDG8: decent work and economic growth are supported by sustainable use, including the use of local labour, local knowledge and local infrastructure to the greatest possible extent
- SDG9: industry, innovation, and infrastructure (also see UNCLOS 13 technology transfer)
- SDG10: reduced inequalities through transfer of biotechnology including non-monetary benefits and capacity building, taking into consideration the Nagoya Protocol on ABS and articles 8(j), 16 and 19 of the United Convention on Biological Diversity
- SDG12: responsible consumption and production requires informed, well-managed use of consumable materials as well as extraction of genetic material

BACKGROUND

1. **Marine resources play a significant role in the economic development and culture of Pacific island states.** Pacific island states have the largest EEZ in the world and marine industries worth billions per year. The islands are also heavily dependent on coastal and near-shore environments for multiple ecosystem services, including food security.
2. **Definitions:** Marine biotechnology is the use of marine resources to develop (as sources) or apply (as targets) biotechnology applications, products, and services.¹ The Organisation for Economic Co-operation and Development (OECD) defines biotechnology as 'the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living and non-living materials for the production of knowledge, goods and services'. Bioprospecting includes the sampling of animals, plants, microbes, and soils in search for marketable components, products, and genetic resources for a variety of industries.
3. **Legal frameworks assist national management.** Fiji and the Cook Islands are developing legislation on bioprospecting and ABS. Solomon Islands and Vanuatu have limited legislation but usable for bioprospecting.
4. **Marine resource use can be lucrative:** e.g. in 2006, the market value of marine genetic resources was estimated to be USD 643 billion in the pharmaceutical sector and USD 231 billion in 2005 to the cosmetic industry.² However, the high cost², specialised technology and expertise required for marine bioprospecting are prohibitive for many public institutions and developing states. Also, only a small fraction of explored resources will produce marketable products.
5. **Sustainable use of identified resources** relies on extraction that does not destroy the necessary environment or exceed a maximum sustainable yield for survival of the target or other species. Much of marine bioprospecting to date is in sensitive environments with [threatened species](#), such as [coral reefs](#), seamounts, vents, and the deep sea.



6. Marine genetic resources are of potentially great economic value, but **our present knowledge of many species is insufficient for informed, sustainable management**. [Marine biodiversity](#) is greater than that on land, and much is unknown. Undiscovered species under threat, which may have little present economic ‘use value’, can have tremendous ‘option value’ for future scientific advancement. For example, significant value (USD 230–330 million) has been attributed to genetic information gained from preventing land conversion in Mexico.³
7. **ABS mechanisms are needed for equitable use** of marine resources, particularly when reliant upon traditional knowledge⁴, while addressing ownership of intellectual property⁵. Adequate management guidelines for bioprospecting are needed for most Pacific island states. Regulatory frameworks are important for effective access with sufficient monitoring and compliance, without hampering research and innovation.
8. **Local understanding boosts local management**. [Marine science research and technology transfer](#) are to be promoted as described in [UNCLOS Part 13](#). (Note that Article 246.5a states the right to withhold consent from research of “direct significance for the exploration and exploitation of natural resources, whether living or non-living”.)
9. **International legislation and industry standards ensure best practice**. To address the conservation and sustainable use of BBNJ, an international legally binding instrument under the UN Convention on the Law of the Sea (UNCLOS) is being developed. The negotiation process will address multiple elements, including 1) marine genetic resources, including ABS; 2) measures such as area-based management tools, including [marine protected areas](#); 3) [environmental impact assessments](#); and 4) capacity building and the transfer of marine technology.

- 1 OECD. 2013. Marine Biotechnology: Enabling Solutions for Ocean Productivity and Sustainability
- 2 Koyoma M. 2008. Marine bioprospecting: key challenges and the situation in South Africa. African Centre for Biosafety
- 3 Maritime Forum. 2013. Study to support impacts assessment for “marine knowledge 2020”.
- 4 Bhatia & Chugh. 2015. Role of marine bioprospecting contracts in developing access and benefit sharing mechanism for marine traditional knowledge holders in the pharmaceutical industry. Global Ecol Conserv 3:176–187
- 5 Heafey E. 2014. Access and benefit sharing of marine genetic resources from areas beyond national jurisdiction: Intellectual property--Friend, not foe. Chicago J Int Law 14:5