



# Seabed Mining: Lessons from the Namibian Experience

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## EXECUTIVE SUMMARY

Until recently, exploiting valuable minerals in deep waters beyond the continental shelf has not been commercially or technologically viable. Closer to shore, limited seabed mining operations have been developed for a range of commodities, including diamonds in Namibia and South Africa, and tin in Indonesia. As marine mining technology has advanced and the demand for minerals has grown in recent years there has been a renewed interest in the mineral wealth of the seabed. However, there has been concern at the environmental impact of such activities and potential conflicts with other economic activities, particularly fisheries.

While exploration for seabed minerals has focused predominantly on the Pacific region, the debates surrounding seabed mining are of increasing relevance to African states. Applications have been made to explore for seabed minerals in the waters off Madagascar and Mauritius, and exploration is underway along South Africa's coast. This briefing provides some detail on the Namibian experience, where opposition by environmental groups and the country's fishing industry has led to a moratorium on the proposed seabed mining of phosphates.

## KEY SEABED MINERALS AND ENVIRONMENTAL CONCERNS

Seabed mining exploration has focused on four main resources: polymetallic (predominantly manganese) nodules, seafloor massive sulphides (SMS), cobalt-rich crusts and phosphates. Most of these minerals occur in the deep-sea regions beyond the continental shelf. Polymetallic (manganese) nodules occur on the seafloor in abyssal plains, which generally range from 3 000 m – 6 000 m in depth.<sup>2</sup> SMS occur along the mid-oceanic ridges and volcanic arcs that form at the boundaries of the earth's tectonic plates, typically at water depths of

## RECOMMENDATIONS

- Seabed mining forms part of a range of activities that may impact the marine zones of African states. It is important for states to establish broader ocean governance policies and inter-departmental structures to facilitate a co-ordinated and strategic response, which includes meaningful consultation with affected communities and stakeholders.
- Many African states have limited capacity in conducting effective reviews of EIAs and EMPs, particularly related to emerging industries such as seabed mining. African states should therefore strengthen capacity in this area. EIA and EMP processing could be strengthened, for example, by the appointment of independent technical councils and environmental experts to provide additional oversight.
- African states that may be impacted by seabed mining should ensure that they participate in the global dialogue on the governance of seabed mining, for example through the International Seabed Authority and the Global Oceans Commission, and avail themselves of the emerging international expertise and best practice in developing national legislative frameworks.

around 2 000 m.<sup>3</sup> Cobalt-rich crusts form on seamounts (essentially underwater mountains) at depths of 400 m – 7 000 m. Phosphates, conversely, are found in relatively shallow waters, generally less than 600 m deep.<sup>4</sup> Phosphate is an important input in the production of fertilizer and has become central to modern agricultural production.

As minerals targeted by seabed mining occur in different forms and geological settings, the potential environmental impact – including on fisheries – should be considered within the particular geological region and mining methodology proposed. Nevertheless, certain common effects of seabed mining may be distinguished, such as the removal of mined material, along with seabed sediments and associated benthic organisms (organisms living on or under the seabed); the perturbation of the seabed; and the introduction of new materials to the environment, such as processing waste or energy in the form of heat, light and seismic and acoustic waves.<sup>5</sup>

The recovery of benthic communities (seabed plants and organisms) depends on a range of natural processes, but is generally most rapid in the intertidal and shallow subtidal zone, slower in coarse gravel sediments and slowest in deep-sea areas, where substantial recovery takes about 40 years. In some cases the impact of marine seabed mining may be particularly long lasting, for example, where mining or dredging changes the characteristics of the seabed, leading to a change in habitat.<sup>6</sup> Opponents to seabed mining emphasise that scientific knowledge of ecosystems in the deep sea and other marine environments is often poorly developed and seabed mining relies on untested technologies that may result in unforeseen impacts on marine ecosystems.

## THE GOVERNANCE OF SEABED MINING

The UN Law of the Sea of 1982 (UNCLOS) provides the central framework for determining rights and responsibilities in terms of the exploration and exploitation of seabed minerals. UNCLOS grants states the right to undertake exploration and exploitation activities for marine minerals on their continental shelves, a zone which generally extends up to 200 nautical miles from the state's coastline.<sup>7</sup>

The seabed beyond areas of national jurisdiction is defined by UNCLOS as 'the Area', and this zone and its resources are declared to be 'the common heritage of mankind', in which exploration and exploitation of marine minerals are to be carried out for the benefit of mankind as a whole.<sup>8</sup> The International Seabed Authority (ISA) was established through UNCLOS in order to develop and

oversee regulations governing the prospecting, exploration and extraction of deep-sea minerals in areas beyond national jurisdiction.<sup>9</sup> All rules, regulations and procedures established by the ISA to govern seabed mining are collectively referred to as the ISA Mining Code. To date the ISA has only issued contracts for exploration activities,<sup>10</sup> but it has recently indicated that contracts for the exploitation of polymetallic nodules may be issued as soon as 2016.<sup>11</sup>

The ISA Mining Code establishes a number of central principles on environmental safeguards for seabed mining, including requirements to:

- prevent, reduce and control pollution and other hazards to the marine environment, applying a precautionary approach and best environmental practices;
- gather environmental baseline data against which to assess the likely effects on the marine environment;
- establish comprehensive programmes for monitoring and evaluating environmental impact;
- include proposals for 'impact reference zones' (areas that are sufficiently representative to be used for assessment of impact on the marine environment); and
- include proposals for 'preservation reference zones' (areas in which no mining shall occur to ensure representative and stable biota of the seabed in order to assess any changes in marine biodiversity).<sup>12</sup>

While the ISA Mining Code is aimed primarily at governing seabed mining in areas beyond national jurisdiction, a number of UNCLOS provisions are also of relevance to national jurisdictions. Article 192 of UNCLOS creates a general obligation for states to protect and preserve the entire marine environment, both within and outside areas of national jurisdiction.<sup>13</sup> Perhaps the central legal obligation for states with regard to seabed mining is the determination by the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea that state laws and regulations governing seabed mining must be 'no less effective than international rules, regulations and procedures' – such as the ISA Mining Code.<sup>14</sup> Moreover, the Seabed Disputes Chamber notes that states have a direct obligation under international law to ensure that seabed mining activities are governed in accordance with the precautionary approach, employing best environmental practice and conducting prior environmental impact assessment.<sup>15</sup> However, an effective state response to these obligations ultimately requires an appropriate national legislative framework.

## NAMIBIA'S RESPONSE TO PROPOSED SEABED PHOSPHATE MINING

Regional scientific studies conducted in the 1970s identified significant phosphate deposits off Namibia's coastline in water depths of 180 m – 300 m. In 2011, the Namibian Ministry of Mines and Energy issued mining licences to two companies for the exploitation of these deposits, subject to the completion and approval of environmental impact assessments (EIAs). The most advanced proposal was that of Namibian Marine Phosphates (NMP), a joint venture formed in 2008 between two Australian-based companies, Minemakers and Union Resources (each with 42.5% shareholding) and Namibian-based Tungeni Investments (15% shareholding).<sup>16</sup> NMP submitted a draft EIA and Environmental Management Plan for the proposed Sandpiper phosphate mining project in January 2012. The EIA also included independent specialist studies dealing with specific potential impacts on fish and fisheries, seabirds and marine mammals, water column dynamics, macrobenthos, and jellyfish.

The project would involve dredging the seabed to a depth of up to 3 m and the removal of up to 5.5 million tonnes of marine sediments annually to produce 3 million tonnes of rock phosphates.<sup>17</sup> The material would be transferred to shore where the phosphate sands would be separated from other marine sediments.<sup>18</sup> NMP representatives argued that the EIA process had revealed no major environmental impacts, and that the phosphate project would contribute significantly to Namibia's foreign exchange earnings and agricultural production. The project was further intended to include an environmental monitoring programme and comply with Namibian environmental regulations and best practices.<sup>19</sup>

The Sandpiper project attracted significant opposition from local and international environmental groups. The Namibian-based Swakopmund Matters, an environmental network, played a key part in disseminating information on the proposed project and galvanising opposition. Other important actors included the Namibian chapter of The Earth Organization and the Australian-based Deep Sea Mining Campaign. The country's fishing sector, which is the third largest contributor to gross domestic product (GDP) and directly employs about 13 000 people, was also strongly opposed to the development of seabed mining. Industry associations such as the Namibian Hake Fishing Industry Association and the Confederation of Namibian Fishing Associations lobbied for a review of the decision to allow marine phosphate mining. Namibia's Minister of Fisheries

and Marine Resources, Bernhard Esau, proved central to the campaign to halt the proposed seabed mining project.

The groups opposing seabed mining for phosphates in Namibia focused on specific elements of the Sandpiper project, arguing, for example, that the EIAs were overly reliant on secondary data and did not adequately reflect the environmental risks associated with the proposed project. They also argued that the EIA for the sea-based and land-based components of the project should be considered in a single EIA process rather than through two separate applications. There were also broader criticisms of phosphate mining in Namibia, emphasising that decision makers should consider the cumulative impact of phosphate mining activities. The approval of the Sandpiper project could set a precedent for the development of additional phosphate mining operations over a much larger area than the initial concessions. It was further argued that the proposed seabed mining for phosphates was a world first and was therefore clouded by uncertainty regarding the environmental impacts on the broader marine ecosystem. Some of the primary environmental concerns included the release of concentrations of hydrogen sulphide and reduced phosphorous compounds in sediment, which are toxic and could lead to low oxygen levels in the water. The release of heavy metals from seabed sediments could also lead to these elements being absorbed in the food chain and ultimately impacting fisheries products. Residents of Walvis Bay, Namibia's largest port and the settlement closest to the proposed processing site, were also concerned about the potential release of toxic elements in the land-based phosphate processing phase, particularly as the area was associated with strong winds.

Significant marine diamond mining has been undertaken in Namibia for a number of decades. Those opposing marine phosphate mining, however, argued that marine diamond mining was less disruptive to the seabed than the proposed dredging technology to be employed by the Sandpiper project, and that marine diamond mining operations showed less overlap with known fishing and fish breeding areas.

The opposition to the Sandpiper project ultimately led to a cabinet decision in September 2013 to place an 18-month moratorium on marine phosphate mining, with the possibility of being extended to three years. The Namibian government has commissioned an independent scoping study and comprehensive EIA to be aligned with a broader strategic environmental assessment of its maritime zone. The studies will be completed by the Norwegian-based Foundation for Scientific and Industrial Research and the Institute for Marine Research.

## CONCLUSION

The development of seabed mining, both within and beyond areas of state jurisdiction, continues to attract widespread opposition from environmental groups and communities on which the proposed projects could have an impact. The moratoriums placed on seabed mining in Namibia and the Northern Territory of Australia, as well as the difficulties faced by companies such as Nautilus in Papua New Guinea in proceeding with seabed mining projects, illustrate the complexity of such operations. The evidence so far has not supported an alarmist view of imminent widespread seabed mining operations. Despite these setbacks, however, exploration for seabed minerals continues to expand, while the ISA is developing a governance framework that would allow contracts to be issued for seabed mining in areas beyond national jurisdiction. Namibia's experience in responding to proposed seabed mining activities highlights the need for national ocean governance policies, planning frameworks such as marine spatial planning, and institutional structures that would facilitate the inter-departmental co-operation needed to respond to the divergent and increasingly complex demands placed on the marine environments of African states. The Namibian experience further illustrates the need for well-governed, comprehensive and credible EIA processes.

## ENDNOTES

- 1 Alex Benkenstein is a senior researcher for GARP at SAIIA.
- 2 Global Oceans Commission, 'Strengthening Seabed Mining Regulation – Global Oceans Commission Policy Options Paper #5', <http://www.globaloceancommission.org/policies/deep-seabed-mining/>.
- 3 *Ibid.*
- 4 *Ibid.*
- 5 NT EPA (Northern Territory Environment Protection Authority), 'Interim Report: Seabed Mining in the Northern Territory', November 2012, p. 25, [www.ntepa.nt.gov.au/\\_\\_data/assets/pdf.../Seabed-Mining-Report.pdf](http://www.ntepa.nt.gov.au/__data/assets/pdf.../Seabed-Mining-Report.pdf).
- 6 *Ibid.*
- 7 It is more accurate to refer to the 'baseline', rather than the 'coastline', in reference to maritime zones. Detailed explanations of how baselines are determined are provided in Articles 5–7 and 9–14 of UNCLOS.
- 8 Scovazzi T, 'Note on the establishment of Marine Protected Areas beyond national jurisdiction or in areas where the limits of national sovereignty or jurisdiction have not yet been defined in the Mediterranean Sea', 2011, [www.rac-spa.org/sites/default/files/doc\\_spamis/note\\_amp\\_en.pdf](http://www.rac-spa.org/sites/default/files/doc_spamis/note_amp_en.pdf).
- 9 Hunter T & M Taylor, 'Deep Seabed Mining in the South Pacific – A Background Paper', Centre for International Minerals and Energy Law.
- 10 Contracts for exploration activities are listed at <http://www.isa.org.jm/en/scientific/exploration/contractors>.
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- 12 NT EPA, *op. cit.*, pp. 44–45.
- 13 Secretariat of the Pacific Community, 'Pacific-ACP States Regional Legislative and Regulatory Framework for Deep Sea Minerals Exploration and Exploitation', SPC SOPAC Division Published Report 111, July 2012, [www.smenet.org/docs/public/FinalDeepSeaMineralsProjectReport.pdf](http://www.smenet.org/docs/public/FinalDeepSeaMineralsProjectReport.pdf).
- 14 Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, 'Responsibilities and Obligations of States Sponsoring Persons and Entities With Respect to Activities in the Area – Advisory Opinion', 1 February 2011, list of cases: no. 17 para. 214: UNLCOS Articles 208(3) and 209(2) 01.
- 15 *Ibid.*
- 16 Minemakers subsequently sold its shareholding to Oman-based Marawid Mining in 2012. Union Resources Limited changed its name to UCL Resources Limited in December 2011.
- 17 Steffani N, 'Marine Benthic Specialist Study for a Proposed Development of Phosphate Deposits in the Sandpiper Phosphate License Area off the Coast of Central Namibia', report prepared for Namibia Marine Phosphates, March 2012, [http://www.envirod.com/pdf/draftsapril2012/NMP\\_FEIAR\\_App\\_1c\\_Marine\\_Benthic\\_Study\\_30March2012.pdf](http://www.envirod.com/pdf/draftsapril2012/NMP_FEIAR_App_1c_Marine_Benthic_Study_30March2012.pdf).
- 18 Namibian Marine Phosphate, 'Sandpiper Project: Proposed Recovery of Phosphate Enriched Sediments from the Marine Mining License Area no. 170 off Walvis Bay, Namibia – Environmental Scoping Report for the Terrestrial Component (Final Report, April 2012)', 2012, [http://www.envirod.com/pdf/scoping\\_report\\_NMP\\_terrestrial\\_component/FinalScoping\\_ReportNMPterrestrialComponent.pdf](http://www.envirod.com/pdf/scoping_report_NMP_terrestrial_component/FinalScoping_ReportNMPterrestrialComponent.pdf).
- 19 Jacobs C, 'Protest against Sandpiper not "emotional sensationalism"', *Namibia Economist*, 21 May 2012, <http://www.economist.com.na/special-focus/1129-protest-against-sand-piper-not-emotional-sensationalism>.

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