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Deep sea mining and related concerns

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The two-year deadline for the International Seabed Authority (ISA) to finalise deep-sea mining rules, set in 2021, has ended. The ISA started global talks in Jamaica in what experts believe can essentially lead to the advancement of this controversial industry.

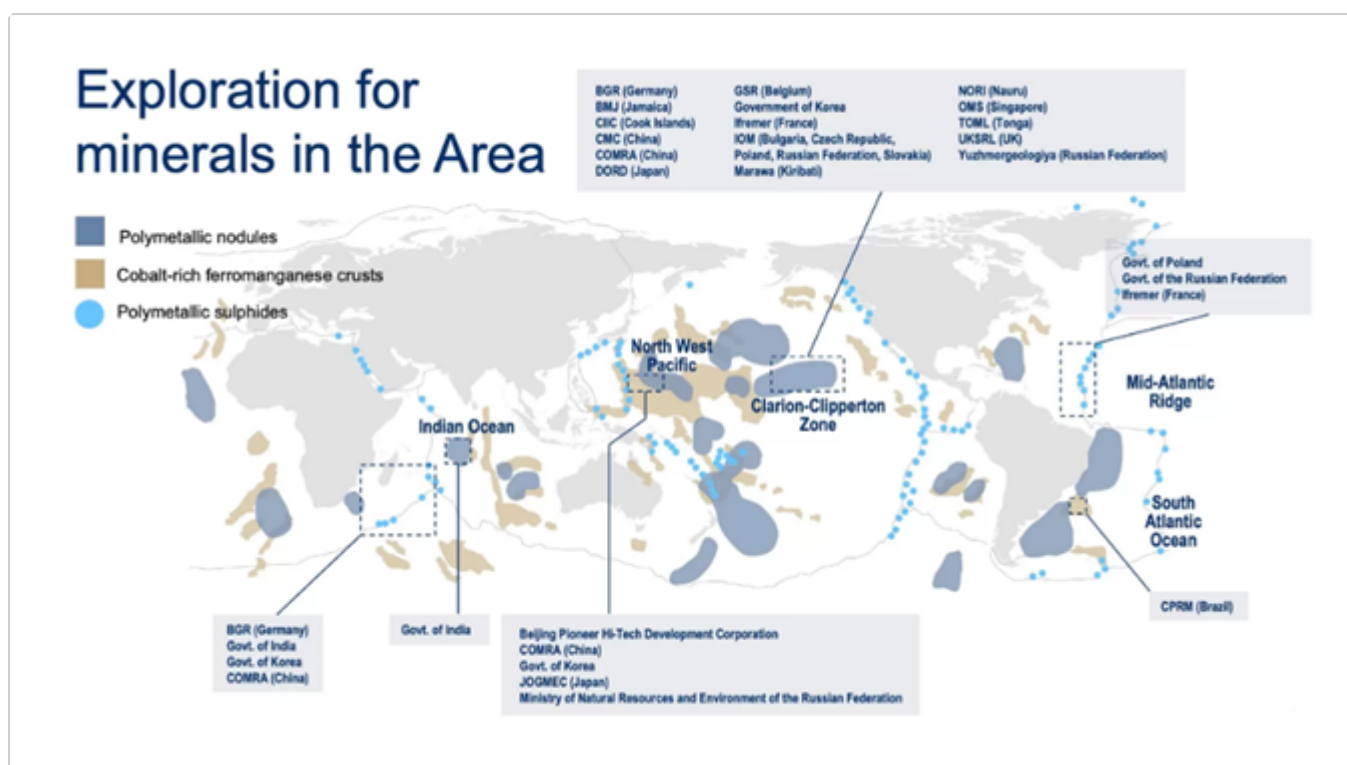
About Deep Sea Mining

According to the International Union for Conservation of Nature (IUCN), the extraction of mineral resources from the ocean below 200 metres is called deep sea mining.

Seabed ecosystems are not yet fully explored, and depleting terrestrial deposits amid an increasing demand for metals like lithium, cobalt, copper, nickel, and manganese has driven increased demand to explore deep sea mining.

Proposed methods to conduct deep sea mining

According to **Deep Sea Conservation Coalition (DSSC)**, an initiative formed in 2004 to safeguard deep-sea ecosystems, the seabed can be mined in three ways:



Extracting metals from polymetallic nodules on abyssal plains:

Abyssal plains are underwater plains on the sea floor.

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Polymetallic nodules contain a variety of metals including manganese, iron, copper, nickel, cobalt, lead and zinc, and small but significant concentrations of molybdenum, lithium, titanium, and niobium, among others.

Stripping cobalt crusts from seamounts:

Scientists believe that underwater mountains formed through volcanic activity are potentially rich in cobalt. Cobalt crusts accumulate at depths of between 400 and 7,000 metres.

Seamounts are also rich sources of iron, manganese, nickel, copper and various rare metals, including rare earth elements.

Extracting polymetallic sulphides from hydrothermal vents:

These are also called sea floor massive sulphides and are rich in copper, iron, zinc, silver and gold.

Active hydrothermal vents are also homes to unique ecosystems, containing chemosynthetic bacteria, giant tube worms, crustaceans, molluscs and other species— many believed to be endemic to the vents.

About CCZ

The Clarion Clipperton Zone, or CCZ, in the eastern Pacific is the most studied area of commercial interest for deep sea mining.

Situated at depths between 3,500 and 5,500 metres, this one zone contains more nickel, manganese and cobalt than all terrestrial resources combined.

CCZ falls outside national jurisdictions, and hence is regulated by the ISA. So far, the authority has granted 16 exploration contracts in the CCZ.

Status of Deep-Sea mining

The ISA can grant exploration contracts only in international waters —the area defined as the seabed and subsoil beyond the limits of national jurisdiction by the United Nations Convention on the Law of the Sea (UNCLOS); thus, the region beyond the outer limits of the continental shelf.

This comprises just over 50% of the entire seabed. UNCLOS is a 1982 agreement that established rules governing the use of the oceans and their resources.

Countries are free to carry out exploration within their borders. Norway in June 2023 proposed opening its waters to deep sea mining in a bid to shift from hydrocarbons towards newer sources of economic activity

France, meanwhile, banned deep sea mining in its waters in January, while Germany has called for a pause in the development of the controversial industry.

India has been granted two exploration contracts from the ISA so far – one for polymetallic nodules, and one for polymetallic sulphides.

Ongoing issue around deep-sea mining

In June 2021, the government of Nauru, a small Micronesian island off the coast of Australia, notified the ISA that they intended to begin deep sea mining and that the organisation should formulate its rules about the same in two years.

Important metals like cobalt, copper, nickel, and manganese, used extensively in batteries, are believed to be abundant in the Clarion-Clipperton Zone (CCZ) in the North Pacific Ocean between Hawaii and Mexico, news

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agency Reuters reported in 2021.

Lionel Aingimea, then President of Nauru, informed the ISA that the mining would be carried out by NaurOcean Resources Inc (NORI), a wholly-owned subsidiary of The Metals Company, formerly known as Deep Green Metals. Nauru is a sponsoring state for NORI.

So far, ISA has only issued exploration contracts (31 till May 2022), but IUCN believes that deep sea mining in international waters could start by 2026.

The concerns around deep sea mining

Right off the bat, humans have very limited knowledge of the seabed. The deep sea is one of the most inaccessible parts of the earth. According to DSSC, exploitation can cause irreversible damage to the fragile deep-sea ecosystem.

A study published in 2020 noted that deep-sea mining can disturb fragile underwater ecosystems for decades. In 1989, 10.8 km² of seafloor were ploughed during a disturbance and recolonisation experiment in the Per Basin to study the environmental impact of a small-scale sediment disturbance

Carbon-based food-web models constructed from data collected in 2015, 26 years after the experiment found significant reduction in both the estimated total system throughput (which signals the ecosystem size) and microbial loop cycling (carbon-cycling through the prokaryotic ecosystem components) inside the plough tracks.

These findings signal that the abyssal site did not recover from the disturbance even after 26 years.

Apart from disturbing flora and fauna, deep sea mining also presents threats of sediment disruption, wastewater generation, and light and noise pollution.

One of the significant concerns of deep-sea mining is the historical information that will be lost forever as permits start being issued, likely this month. More importantly, we can't discount its ecological impact as the species' database from the deep ocean is extremely limited