



General Studies-3; Topic: Conservation, environmental pollution and degradation, environmental impact assessment.

Deep sea mining

Introduction

- 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 has driven increased demand to explore deep sea mining.
- The International Seabed Authority (ISA) has decided that it will start taking permit applications from companies that want to mine the ocean floor.

Methods to conduct deep sea mining

- Extracting metals from polymetallic nodules on abyssal plains.
- Stripping cobalt crusts from seamounts.
- Extracting polymetallic sulphides from hydrothermal vents.

Concerns around deep-sea mining

- Deep sea is one of the most inaccessible parts of the earth.
- Exploitation can cause **irreversible damage to the fragile deep-sea ecosystem**.
- It **disturbs flora and fauna** that have adapted to conditions such as poor oxygen and sunlight, high pressure and extremely low temperatures.
- The deep sea's biodiversity and ecology remain poorly understood, making it difficult to assess the environmental impact and frame adequate guidelines.
- It presents threats of **sediment disruption, wastewater generation, and light and noise pollution**.

- The historical information that will be lost forever.
- The specialized drills and extraction-technology that would be required pulling out the metals from the deep sea would develop a major technical challenge.

Clarion Clipperton Zone (CCZ)

- Clarion Clipperton Zone in the eastern Pacific is the most studied area of commercial interest for deep sea mining.
- It contains more nickel, manganese and cobalt than all terrestrial resources combined.

Status of deep-sea mining

- Countries are free to carry out exploration within their borders.
- Norway in June 2023 proposed opening its waters to deep sea mining.
- France banned deep sea mining in its waters, while Germany has called for a pause.
- **India has been granted two exploration contracts so far – one for polymetallic nodules, and one for polymetallic sulphides.**

Way Forward

- There is an urgent need for an international charter as in the absence of a clear charter, deep sea mining could cause irreversible damage.
- **A new set of exploration guidelines must be worked out with discussions involving multi-stakeholders like ISA, IUCN, UNCLOS, littoral nations etc.**