Deep Sea Mining and its Threats

Prelims: Deep Sea mining, UNCLOS, Frontiers in Marine Science report, Deep Sea mission

Mains: Deep-Sea mining and its Impacts.

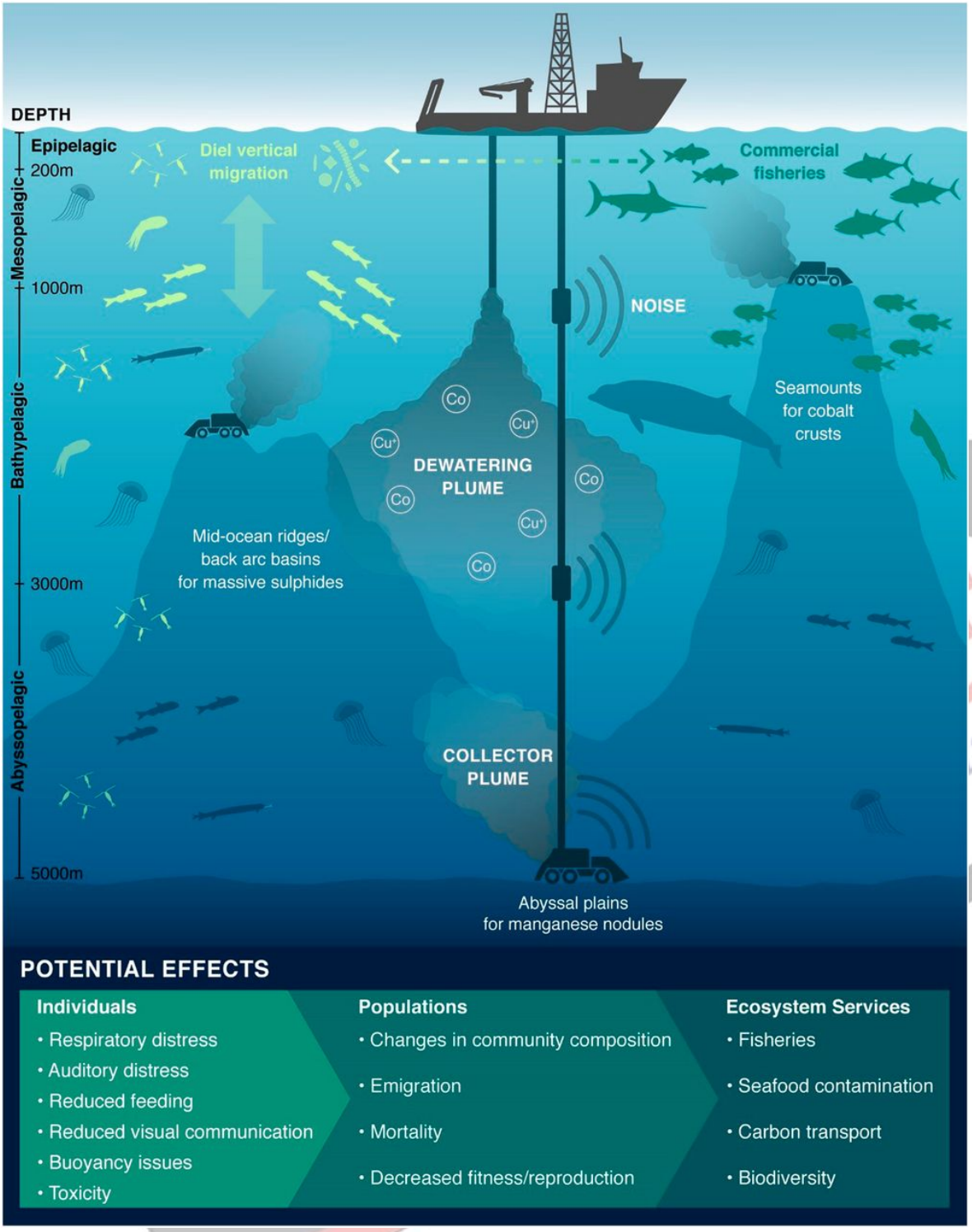
Why in News?

Recently, a study suggested that commercial-scale **Deep seabed mining operations can potentially harm the oceans and endangered species, such as cetaceans including blue whales and several dolphin species.**

- The evaluation emphasizes the need for continued conservation efforts to protect these species.

What is Deep Sea Mining?

- **About:**
  - **Deep-sea mining** is the process of retrieving mineral deposits from the deep seabed the **ocean below 200 metres** and covers **two-thirds of the total seafloor.**
  - According to **International Seabed Authority (ISA),** an agency under **the** United Nations Convention on the Law of the Sea (UNCLOS) for monitoring all activities related to mineral resources in the deep sea, the **international seabed is the area that lies beyond the limits of national jurisdiction** and represents around 50% of the total area of the world's oceans.
  - ISA has issued 32 contracts to explore deep sea mineral deposits. More than **1.5 million square kilometres of the international seabed** have been set aside for mineral exploration.



- **Governance:**
  - ISA is required by UNCLOS to put in place the **governance infrastructure including rules, regulations and procedures governing the contours of deep-sea mining within 2 years.**
  - In case of failure, the ISA must **at least evaluate the mining proposal by the end of two years.**
  - The **11th Annual Deep Sea Mining Summit 2023** is to be held in **London, United Kingdom.** Agenda includes the **"economic landscape and growth for deep sea mining and technological developments** associated with commercialising".
- **Reasons for Growing Interest:**
  - **Depleting Terrestrial Deposits: Depleting stocks of** metals such as **copper, nickel, aluminium, manganese, zinc, lithium and cobalt** caused shift in focus towards Deep Sea Deposits.

        - Mineral resources are extracted from **Polymetallic nodules** found in various deep ocean regions including deep pacific and Indian oceans.
        - The nodules are approximately **potato-sized** and sit on the sediment surface across abyssal plains in the **Clarion-Clipperton Zone (CCZ)**, a region spanning 5,000 kilometres (3,100 miles) across the central Pacific Ocean at depths of 4,000 - 5,500 metres.
    - **Increasing Demand**: Demand for these metals is also increasing **to produce smartphones, wind turbines, solar panels and batteries.**

What are the Cetaceans?

- Cetaceans are **exclusively aquatic placental mammals (including Whales, Dolphins, Porpoises, etc.) constituting the order Cetacea.** They are **found in oceans worldwide and in some freshwater environments.**
- They have a tapered body, no external hind limbs, and a tail ending in a horizontal blade of two lobes, or flukes.
- Cetaceans must **come to the water's surface to breathe** through blowholes located on top of their head.

What are the Threats?

- Commercial-scale mining is expected to operate 24 hours a day, causing **noise pollution.**
    - It can **overlap with the frequencies at which cetaceans communicate**, which **can cause auditory masking and behaviour change** in marine mammals.
- **Settlement of sediment plumes** generated by mining vehicles **could harm/kill the species at the bottom of the ocean (benthic species)** in the vicinity.
- Sediment discharged from processing vessels can also **increase turbidity in the water column.** Also, far from sight impacts could go largely unquantified.

What is India's Deep Ocean Mission?

- Deep Ocean Mission **seeks to develop the technologies required for exploring and then, extracting minerals** in the deep seabed.
- **Ministry of Earth Sciences (MoES) will be the nodal Ministry** implementing this multi-institutional ambitious mission.
- It would develop a **manned submersible** (MATSYA 6000) that can carry **three people to a depth of 6,000 meters** in the ocean with a suite of scientific sensors and tools.
- It will pursue **technological innovations for exploration and conservation of deep-sea biodiversity through "bioprospecting of deep-sea flora and fauna** and studies on **sustainable utilization of deep-sea bio-resources.**
- The mission will seek to explore the prospects of **deriving energy and freshwater from the ocean** through "studies and detailed engineering design for **offshore ocean thermal energy conversion (OTEC)**-powered desalination plants.

What are other Blue Economy Initiatives?

- **India-Norway Task Force on Blue Economy for Sustainable Development:**
- **Sagarmala project**
- **O-SMART**
- **Integrated Coastal Zone Management**
- **National Fisheries policy**

UPSC Civil Services Examination Previous Year Question (PYQ) nation

Prelims

Q1. With reference to 'Indian Ocean Rim Association for Regional Cooperation (IOR-ARC)', consider the following statements: (2015)

1. It was established very recently in response to incidents of piracy and accidents of oil spills.
2. It is an alliance meant for maritime security only.

Which of the statements given above is/ are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans: (d)

Exp:

- Indian Ocean Rim Association for Regional Cooperation (IOR-ARC) is a regional cooperation initiative of the Indian Ocean Rim countries which was established in Mauritius in March 1997 with the aim of promoting economic and technical cooperation among its members. Hence, statement 1 is not correct.
- IOR-ARC is the only pan-Indian ocean grouping. It has 23 Member States and 9 Dialogue Partners.
- It aims to create a platform for trade, and socio-economic and cultural cooperation in the Indian Ocean Rim area, which constitutes a population of about two billion people. Hence, statement 2 is not correct.
- The Indian Ocean Rim is rich in strategic and precious minerals, metals and other natural resources, marine resources, and energy, all of which can be sourced from Exclusive Economic Zones (EEZ), continental shelves, and the deep seabed. Therefore, option (d) is the correct answer.

Q2. Consider the following statements: (2021)

1. The Global Ocean Commission grants licences for seabed exploration and mining in international waters.
2. India has received licences for seabed mineral exploration in international waters
3. 'Rare earth minerals' are present on the seafloor in international waters.

Which of the statements given above are correct?

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans: (b)

- **International Seabed Authority (ISA) is a UN body set up** to regulate the exploration and exploitation of marine non-living resources of oceans in international waters. It considers applications for exploration and exploitation of deep-sea resources from contractors, assesses environmental impact assessments and supervises mining activities. **Hence, statement 1 is not correct.**
- India was the first country to receive the status of a 'Pioneer Investor' in 1987 and was given an area of about 1.5 lakh sq. km in the Central Indian Ocean Basin (CIOB) for nodule exploration. India's exclusive rights to explore polymetallic nodules from seabed in the Central Indian Ocean Basin was extended in 2017 for five years. **Hence, statement 2 is correct.**
- Rare earth minerals are present on the seafloor in international waters. The sea floor of various

oceans boasts one of the world's largest untapped collections of rare-earth minerals. **Hence, statement 3 is correct. Therefore, option (b) is the correct answer.**

Mains

Q. Critically evaluate the various resources of the oceans which can be harnessed to meet the resource crisis in the world. **(2014)**

Source:DTE