# Samudrayaan Project

**Source: IE**

## Why in News?

Two Indian aquanauts dived into the **Atlantic Ocean** aboard **France's submersible Nautile** as part of preparations for the **Samudrayaan Project.**

## What is the Samudrayaan Project?

- **About: Samudrayaan** is India's first human deep-sea mission. It is a key component of the **Deep Ocean Mission**.
  - The project aims to send **three humans in a manned submersible ( Matsya-6000)** to a depth of **6,000 metres** in the ocean by 2027.
  - It will strengthen India's strategic position by joining the select group of countries (US, Russia, China, Japan, France) with manned deep-sea capability.
- **Key Objectives: Develop technologies for deep-sea mining, submersibles, and ocean robotics.**
  - Conduct surveys for mineral deposits, especially polymetallic nodules (containing iron, manganese, cobalt, nickel, rare earths).
- Matsya-6000: It is India's first self-propelled manned submersible. It is made of titanium-alloy in a spherical shape and can carry three aquanauts for 12 hours, with the capability to sustain them for up to 96 hours in emergencies.
  - It is expected to withstand an external pressure up to **600bar under low temperature conditions of -3°C.**
  - **It is equipped with life-support, acoustic communication, Li-Po batteries, drop-weight escape, and bio-vests for crew health monitoring.**
  - The development of MATSYA 6000 is a collaboration between the National Institute of Ocean Technology (NIOT), the Ministry of Earth Sciences (MoES), and the Vikram Sarabhai Space Centre (VSSC) of ISRO.


## What is the Deep Ocean Mission?

- **Objective:** Launched by Ministry of Earth Sciences (MoES) for a period of **5 years (2021-26)** to develop technologies for exploring and sustainably utilizing the deep ocean's living and non-living resources
  - It promotes **India's Blue Economy**, covering marine industries like fishing, shipping, biotechnology, and tourism
  - It supports climate change research and aligns with **UN's 2021–2030 'Decade of Ocean Science for Sustainable Development'**
- **Mission Components:**
  - **Deep Sea Mining & Manned Submersible:** Development of submersible to reach 6,000 m and mining of polymetallic nodules. Prepares India for future commercial deep-sea exploration under **International Seabed Authority rules.**
  - **Ocean Climate Change Advisory Services:** Observation and modeling of climate variables for seasonal to decadal projections, aids **Blue Economy** and coastal tourism.
  - **Deep-Sea Biodiversity:** Bio-prospecting and sustainable use of deep-sea flora, fauna, and microbes.
  - **Deep Ocean Survey & Exploration:** Identifying multi-metal hydrothermal sulphide sites along Indian Ocean ridges.
  - **Energy & Freshwater from Ocean:** Feasibility studies for **Ocean Thermal Energy Conversion (OTEC)** desalination plant, supports offshore energy development.
  - **Advanced Marine Station:** Build talent in ocean biology and engineering; turn research into industrial products via on-site incubators.
- **Progress:** Under the mission, the deep-water **Autonomous Underwater Vehicle (AUV) Ocean Mineral Explorer (OMe 6000)** was deployed for exploration.
  - In December 2022, it surveyed mineral-rich zones at a depth of 5,271 meters in the **Central Indian Ocean Basin Polymetallic Manganese Nodule (PMN) site.**
  - Using the research vessel **SagarNidhi**, the AUV OMe 6000 conducted a 14 sq. km survey to assess **polymetallic nodule distribution and deep-sea biodiversity,** paving the way for future exploration and resource mapping.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

## ***Prelims***

**Q: With reference to the United Nations Convention on the Law of Sea, consider the following statements: (UPSC Prelims 2022)**

1. A coastal state has the right to establish the breadth of its territorial sea up to a limit not exceeding 12 nautical miles, measured from a baseline determined in accordance with the convention.
2. Ships of all states, whether coastal or land-locked, enjoy the right of innocent passage through the territorial sea.
3. The Exclusive Economic Zone shall not extend beyond 200 nautical miles from the baseline from which the breadth of the territorial sea is measured.

**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: (d)

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**Q: 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)