What is India's Deep Ocean Mission?

The Government of India has decided to launch the Deep Ocean Mission, with an aim to explore the marine diversity in our country, which is still unexplored. This ambitious project will be managed by the Ministry of Earth Sciences (MoES).

Through this mission, the Government aims to conduct the exploration of the underwater world on similar lines as ISRO does for space. In this article, we shall discuss at length about the Deep Ocean Mission and its significance for the country.

About the Deep Ocean Mission

- The mission has been laid on similar terms as the Indian Space Research Organisation (ISRO) performs space research
- However, India's Deep Ocean Mission will solely focus on studying and exploring the deep water bodies in our country for undiscovered minerals, stones, living or non-living entities
- Both, man force and robotic machines will be used for the mission
- Tasks like deep sea mining, energy exploration, survey of the objects found, and the off-shore desalination will be taken up rigorously
- The technological developments done for the Deep Ocean Mission will be funded by the Government scheme "Ocean Services, Technology, Observations, Resources Modelling and Science (O-SMART)"
- Study and research on the climatic changes in the Ocean and other advisory services will be done through this mission
- Focus will also be given on underwater technologies for convenient research
- Two key projects have been included in the Deep Ocean Mission
    - A Desalination Plant
    - Submersible Vehicle, which can explore upto 6000 metres in depth
- The parts of the ocean which are yet to be explored and are hidden and undiscovered will all be covered through this mission

Related Links	
Indian Ocean Rim Association	International Maritime Organization (IMO)
Salinity Of Ocean Water	Inland Waterways Authority
Ocean Floor And Its Features [Geography Notes For UPSC]	Water Stress in India & Prevention of Water Scarcity

Significance of Deep Ocean Mission

The Deep Ocean Mission plan will enable India to develop capabilities to exploit resources in the Central Indian Ocean Basin (CIOB).

One of the major objectives of this project is to mine and extract polymetallic nodules (PMN). The UN International SeaBed Authority has allotted India 75000 sq. kilometers in CIOB for the exploration of these polymetallic nodules.

What are Polymetallic Nodules (PMN)?

- Polymetallic nodules are Fe-Mn oxide deposits
- They are potato shaped and porous
- Appearance wise, they are of a black earthy colour
- Size ranges from 2 to 10 cm in diameter
- PMN is considered as the precipitate of hot fluids from upwelling hot magma from deep interior of the oceanic crust, discharged through mineralized paths
- These Rare earth minerals are considered as the great source of valuable minerals such as gold, silver and zinc

UPSC aspirants can read in detail about the The International Seabed Authority (ISA) at the linked article, and know functions and role of this intergovernmental body.

Where can PMN be mined?

There are specific locations underwater where the mining of polymetallic nodules can be done. Any country which intends to mine PMN needs to get authorisation from ISA, which was established under the United Nations Convention on the Law of the Sea (UNCLOS).

- The underwater 75,000 sq metres of area which has been assigned to India, is the part where the mining can be done
- In 1987, India gained the status of a 'Pioneer Investor' and was the first country to be acknowledged with this status. It was then given an area of 1.5 lakh sq. kilometer for the mining of PMN
- In 2002, ISA conducted a resources analysis and assigned the 75,000 sq. kilometer area to India
- As per the research done by the Ministry of Earth Science, following conclusion can be drawn:
    - Potential polymetallic nodules which can be found - 880 MT (approximately)
    - Nickel - 4.7 MT (approximately)
    - Magnesium - 92.59 MT (approximately)
    - Copper - 4.29 MT (approximately)
    - Cobalt - 0.55 MT (approximately)

What are Exclusive Economic Zone (EEZ)

It is a zone in the sea prescribed by the United Nations Convention on the Law of the Sea (UNCLOS) over which a country has certain rights for exploration of marine resources.

India has an Exclusive Economic Zone (EEZ) of about 2.37 million sq.km, and most part of it lies unexplored and undiscovered.

To know more about the Exclusive Economic Zone, its area for other major countries, candidates can visit the linked article.

Other Countries Exploring Underwater Elements

Apart from the Central Indian Ocean Basin (CIOB), PMN have also been discovered in the Central Pacific Ocean. This is also known as the Clarion-Clipperton Zone.

Major countries including China, France, Germany, Japan, South Korea, Russia are a part of the list of those countries which have signed a contract with ISA for exploration of polymetallic nodules.

This list is not just limited to major countries, but also a few islands countries have started their exploration for PMN, for example: Kiribati, an independent country in the Central Pacific Ocean.

Impact of Deep Ocean Mission on the Environment

A major concern has been shown by Environmentalists for the Ocean mining that is being conducted in various countries. The biggest concern is that since this field is unexplored, the repercussions cannot be assumed.

Another cause of concern is the sediment plumes which may have formed after the mining practise and the oil spills which may be caused.

However, India seems to be positive with their research as major revelations can be done once the mission takes off and the research is started. One of the most important of which is the fact that since the temperature at deep depths of the ocean is very low, a lot of species will be discovered which are capable of surviving in extreme weather conditions.

All the activities which shall be performed under the Deep Ocean Mission will be as per the rules prescribed by ISA, ensuring no harm is caused to the biodiversity.

Other Related Links	
Government Exams	UPSC Syllabus
Environment And Ecology Notes For UPSC	UPSC MCQ On Science & Technology

Central Water Commission	Difference between between Sea and Ocean