Mains Marathon

Day 3: Marine resources can compensate for the resource scarcity on land. Analyse the role of Samudrayan project with respect to harnessing the blue economy. (250 Words)

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Approach / Explaination / Answer

- Start your answer by writing a brief on the Blue Economy and Samudrayan project.
- Discuss, with reference to Samudrayan project, how marine resources can help in mitigating resource scarcity on land
- Conclude by giving reference to the importance of Ocean ecosystem

Answer

According to the World Bank, the blue economy is the **sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean ecosystem**.

It is often referred to as **“marine economy”**, **“coastal economy”**, or **“ocean economy”** in the literature, the concept is at a nascent stage and is yet to be encapsulated in a comprehensive definition from an operational perspective

Importance of Marine Ecosystem

Oceans are the **world’s single largest ecosystem,** covering nearly three-fourths of the earth’s surface, thereby providing a massive arena for emerging complex and interconnected development issues such as climate change, livelihoods, commerce, and security.

According to estimates by the Global Ocean Commission, **ocean resources contribute five percent of the world’s GDP, secure the jobs of three billion people, and sustain the livelihoods of 350 million**.

Samudrayan Project of India

It is **India’s first unique manned ocean mission** that aims to send men into the deep sea in a submersible vehicle for **deep-ocean exploration and mining of rare minerals**.

It is a **part of the Rs 6000-crores Deep Ocean Mission,** which **aims to explore the deep ocean for resources**, develop deep-sea technologies for sustainable use of ocean resources, and support the Blue

Economy Initiatives of the Indian Government.

Objectives of Mission Samudrayan

Samudrayan will be carrying out deep ocean exploration of the non-living resources such as polymetallic manganese nodules, gas hydrates, hydro-thermal sulphides and cobalt crusts.

Underwater vehicle Samudrayan carrying out subsea activities such as high-resolution bathymetry, biodiversity assessment, geoscientific observation, search activities, salvage operation and engineering support.

Significance of Samudrayan Project of India

- This will **open up more growth avenues to explore ocean resources** for clean energy, drinking water, and Blue economy.
- Developed countries have already carried out similar ocean missions. **India is the 1st country among the developing nations** to carry out a deep ocean mission.
- It will help in **addressing issues arising from long term changes** in the ocean due to climate change.
- The technologies developed under the mission can be used for deep-sea mission of living (biodiversity) and non-living (minerals) resources
- It will enhance India's meteorological expertise and India can emerge as a regional player with ocean climate change advisory services
- To identify technological innovations and conservation methods for sustainable utilization of marine bio- resources
- It will help in developing offshore based **desalination techniques**
- The mission will help in **developing renewable energy generation techniques**
- It will help in providing clean drinking water and explore the avenues of desalination of water as well as **extracting minerals from the ocean belt**.

Impact of mining activities on the biodiversity and ecosystems of the deep-sea:

The scraping of the seabed by machines can either **alter or destroy deep-sea habitats,** leading to **fragmentation or loss of ecosystem structure and function**.

Also, **most of the species living in the deep sea are endemic** (not found anywhere else on Earth) and the physical disturbances at a mining site **may possibly wipe out entire species**.

Deep-sea mining may also result in **stirring up fine sediments on the seabed** such as silt, clay and the remains of microorganisms, **creating plumes of suspended particles in the ocean**.

It is indistinct **how far these particles may scatter past the mining zone, how long it would require for them to resettle on the ocean floor, and to what extent they may negatively impact ecosystems and species**.

Noise, vibrations, potential leaks, spilling of toxic products or fuels and light pollution caused by mining equipment and surface vessels may have a negative impact on the species.

Way Forward

Comprehensive studies of the ocean floor are needed to get a better understanding of the species, their way of living, and how mining activities may impact them.

Environmental impact assessments are required to assess the **extent and duration of environmental damage caused by deep-sea mining**.

To avoid loss of biodiversity and long-lasting negative impact on the environment; **large areas must be protected to leave the seafloor undisturbed,** in addition to **precautionary controls on the**

permissible extent and duration of mining operations.

The three **R's- Reduce, Reuse and Recycle** must be encouraged to minimize the demand for raw materials from the deep sea.