Marine Sand Extraction

For Prelims: **Sustainable Sand Mining Management Guidelines 2016**, Marine Sand Watch

For Mains: Environmental and socio-economic impacts of marine sand extraction, Sand Mining in India.

Source: DTE

Why in News?

Recently, a newly launched data platform called **"Marine Sand Watch"** sheds light on this critical issue, revealing the **scale of sand extraction** and its far-reaching consequences.

- The relentless extraction of sand from the world's oceans is posing a severe threat to **marine ecosystems and coastal communities.**

What is Marine Sand Extraction?

- **About:**
  - Marine sand extraction is the process of **removing sand from the seabed or the coastal zone** for various purposes, such as **construction, land reclamation, beach nourishment, or mining.**
- **Process:**
  - **Dredging:**
    - Dredging is the most common method of marine sand extraction. It **involves using a vessel equipped with a suction pipe or a mechanical grab to scoop up the sand** from the seabed and transport it to the shore or another location.
  - **Mining:**
    - Mining is another method of marine sand extraction. It involves using specialized equipment, such as drills, cutters, or jets, to break up the sand deposits and extract the minerals or metals from them.
  - **Harvesting:**
    - Harvesting is a less common method of marine sand extraction. It involves using natural forces, such as waves, currents, or tides, to collect the sand from the coastal zone and deposit it onshore.
- **Extraction Estimates:**
  - The platform has estimated that **between four and eight billion tonnes of sand** are being dredged from the **ocean floor** every year.
    - Marine sand extraction is **expected to rise to 10 to 16 billion tonnes** per year, which is the **natural replenishment rate** or the amount that rivers need to maintain coastal and marine ecosystem structure and function.

Marine Sand Watch:

- It is a data platform developed by **a Centre for Analytics within the** United Nations

Environment Programme (UNEP).

- The platform will **track and monitor dredging (removal) activities** of sand, clay, silt, gravel, and rock in the world's marine environment.
- It will provide information on areas used for sand extraction , areas of capital and maintenance dredging, sand trading ports/hubs, number of vessels and operators, and extraction of sediment and other types of activities by countries with **Exclusive Economic Zones.**

What is the Impact of Marine Sand Extraction?

- **Environmental Impact:**
  - **Turbidity of Water: Sand extraction increases water turbidity** (the measure of relative clarity of a liquid), reducing water clarity and affecting aquatic ecosystems.
  - **Nutrient Alteration:** It disrupts **nutrient availability, potentially harming marine flora and fauna.**
  - **Noise Pollution:** The extraction process generates **noise pollution, which can disturb marine organisms and their habitats.**
- **Community and Infrastructure Impact:**
  - **Coastal Community Vulnerability**: Coastal communities face risks as **sand is needed for coastal defence structures**, critical in **mitigating rising sea levels and storms.**
  - **Infrastructure Support:** Marine sand is crucial for **building offshore infrastructure**, including wind and wave turbines.
  - **Salinization Risk:** Coastal or near-shore extraction can lead to the **salinization of aquifers, impacting freshwater resources.**
  - **Tourism Development:** Sand extraction can hinder future **tourist development in coastal areas,** affecting local economies.

What are the Responses to Marine Sand Extraction?

- **Sand Mining in India:**
  - Sand is classified as a "**minor mineral"**, under the **Mines and Minerals (Development and Regulations) Act, 1957 (MMDR Act)** and administrative control over minor minerals vests with the State Governments.
    - **Rivers and coastal areas** are the main sources of sand, and the demand for it has increased significantly in recent years due to the construction and infrastructure development boom in the country.
  - The **Ministry of Environment, Forests, and Climate Change (MoEFCC)** has issued **"Sustainable Sand Mining Management Guidelines 2016"** to promote **scientific sand mining** and environmentally friendly management practices.
- **Global Responses:**
  - Some countries like Indonesia, Thailand, Malaysia, Vietnam, and Cambodia have banned marine sand exports in the last two decades.
- **UNEP Recommendations:**
  - The UNEP advocates for better monitoring of sand extraction and use.
  - UNEP calls for the establishment of international standards for sand extraction in the marine environment.
- **International Seabed Authority (ISA):**
  - The **ISA** is an **intergovernmental organization that regulates deep-sea mining and exploration in international waters.**
  - The ISA was established in 1982 under the **United Nations Convention on the Law of the Sea (UNCLOS).**

Way Forward

- More innovation and investment are required for **sustainable alternatives to marine sand extraction.** This involves reducing sand demand through better construction materials, recycling, and **circular economy** principles.

    - It also includes exploring alternative sources of sand, such as **manufactured sand** from crushed rock or quarry dust, or natural sources such as **desert or volcanic sand.**
- Effective **governance and regulation of marine sand extraction, at various levels, is crucial.** This involves establishing clear standards for environmental assessments, licensing, reporting, and auditing.
- The **UNEP Marine Sand Watch initiative** is a positive step, but there is a need for more cooperation and support from stakeholders for better data and policymaking.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Consider the following statements:

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)

- The Global Ocean Commission was an international initiative between 2013 and 2016 to raise awareness, promote action to address the degradation of the ocean and help restore it to full health and productivity.
- 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 have unique magnetic, luminescent, and electrochemical properties and thus are used in many modern technologies, including consumer electronics, computers and networks, communications, health care, national defense, etc. They are called 'rare earth' because earlier it was difficult to extract them from their oxides forms technologically.
- 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. Coastal sand mining, whether legal or illegal, poses one of the biggest threats to our environment. Analyze the impact of sand mining along the Indian coasts, citing specific examples. **(2019)**