



Offshore Sand Mining in Kerala

For Prelims: [Geological Survey of India](#), [Indian territorial waters](#), [Exclusive Economic Zone](#), [Desalination](#), [Mineral oils](#), [Sustainable Development Goals](#)

For Mains: Sand mining, Offshore Mineral Regulation, Impact of Mining on Coastal Ecosystems

Source: DTE

Why in News?

The Union government's move to begin **offshore sand mining** along **Kerala's coast** under the [Offshore Areas Mineral \(Development and Regulation\) Amendment Act, 2023 \(OAMDR Amendment Act\)](#), has drawn sharp opposition from the state government and local communities over concerns about ecological and livelihood impacts.

Why is the Government Pushing for Offshore Sand Mining?

- **Economic Potential:** The Centre's decision to permit offshore mining of construction sand is based on a study by the [Geological Survey of India \(GSI\)](#).
 - Since 1985, GSI surveys have identified **construction-grade sand resources** off **Ponnani, Chavakkad, Kochi, Alappuzha, and Kollam**, at water depths ranging from 22 to 45 metres.
 - These deposits, located within [Indian territorial waters](#) (up to 12 nautical miles) and in the [Exclusive Economic Zone \(EEZ\)](#), contain sand with a **range of 80% to 96% purity** and **clay content between 4% and 20%**.
 - The sand, originally **sourced from rivers**, has undergone marine processes, making it suitable for **construction after desalination**.
 - With an estimated **750 million tonnes of reserves**, these sand deposits could **satisfy Kerala's construction needs for the next 25 years**, at a rate of 30 million metric tonnes annually.
- **Auction Plan:** The Centre under the **OAMDR Amendment Act, 2023** plans to auction sand blocks in five sectors of Kerala's coastal areas, including **Ponnani, Chavakkad, Alappuzha, Kollam North, and Kollam South**.
- **Revenue Generation:** The offshore sand mining is expected to bring in significant **income** through [shipping, trade](#), and [Goods and Services Tax \(GST\) collection](#).

Sand Mining

- **Sand is classified as a "minor mineral"** under the [Mines and Minerals \(Development and Regulations\) Act, 1957 \(MMDR Act\)](#), with state governments overseeing its administration.
- The **Ministry of Environment, Forests, and Climate Change (MoEFCC)** issued the ["Sustainable Sand Mining Management Guidelines 2016"](#) to promote scientific and eco-friendly sand mining practices.

What is Offshore Mining?

- **About:** Offshore mining involves extracting minerals or precious stones from the [seabed](#).
- **Potential for Offshore Mining in India:** India's **EEZ** spans over **two million square kilometers**, the GSI has delineated resources of various minerals in the offshore areas.
 - **Lime mud:** 153,996 million tons (off Gujarat and Maharashtra coasts)
 - **Construction-grade Sand:** 745 million tons (off Kerala coast)
 - **Heavy Mineral Placers:** 79 million tons (off Odisha, Andhra Pradesh, Kerala, Tamil Nadu, Maharashtra coasts)
 - **Polymetallic Nodules:** Andaman Sea and Lakshadweep Sea.
- **Offshore Critical Mineral Auction:** India launched its [first-ever offshore critical mineral auction in 2024](#) under the OAMDR Act, 2002 offering **13 blocks across the Arabian Sea and Andaman Sea**.
 - The auction targets **critical minerals like lithium, cobalt, nickel, and copper**, essential for infrastructure, [renewable energy](#), and advanced technologies.
 - With this initiative, India aims to reduce import reliance, enhance resource availability, and strengthen its position in the global mineral market.

What are the Laws and Rules Governing Offshore Mining?

- **OAMDR Amendment Act 2023:** The Act amends the **Offshore Areas Mineral (Development & Regulation) Act (OAMDR Act), 2002**, which governs the exploration and extraction of mineral resources in India's territorial waters, continental shelf, and EEZ.
 - OAMDR Amendment Act 2023 introduces a **transparent auction process for offshore operating rights**, establishes a trust for mining-affected people, and boosts exploration.
 - It removes discretionary renewals, and sets a **50-year lease period**.
 - To implement the amended provisions of the OAMDR Act, the Ministry of Mines has framed [Offshore Areas \(Existence of Mineral Resources\) Rules, 2024](#) and [Offshore Areas Operating Right Rules, 2024](#).
- **Offshore Areas (Existence of Mineral Resources) Rules, 2024:** These rules apply to all minerals in offshore areas, excluding [mineral oils, hydrocarbons](#).
 - They do not affect the [Atomic Energy Act, 1962](#), or the provisions related to minerals specified in **Part B of the First Schedule of the Mines and Minerals (Development and Regulation) Act, 1957**.
 - **Stages of Exploration:** The rules define four stages for exploration.
 - **Reconnaissance Survey (G4):** Initial phase for identifying mineral deposits.
 - **Preliminary Exploration (G3):** More detailed exploration based on G4 findings.
 - **General Exploration (G2):** Further detailed exploration that could lead to production.
 - **Detailed Exploration (G1):** Final stage confirming the precise nature of resources.
 - A minimum of **G2 level exploration is required for auctioning blocks for production leases**.
- **Offshore Areas Operating Right Rules, 2024:** Lessees can surrender their lease after **10 years if operations become uneconomical**.
 - Lessees must report new mineral discoveries within **60 days and update their lease deeds accordingly**.
 - Government bodies have priority access to reserved **offshore zones for securing operating rights**.

What are the Concerns Regarding Offshore Mining?

- **Pollution Risks:** Offshore mining creates **sediment plumes** and releases **toxic wastewater containing heavy metals**, posing long-term risks to **marine life, and ecosystems** reliant on marine resources.
 - In Kerala, environmentalists warn that offshore sand mining could destabilize ecosystems, weaken **natural defenses against tsunamis, cyclones, erosion**, and disrupt sediment

dynamics, threatening aquatic habitats.

- **Revenue Collections:** States like Kerala argue the OAMDR Amendment Act, 2023 does **not safeguard state interests**.
 - **Royalty revenues** from mining are **assigned entirely to the central government**, sidelining state authorities.
 - **Private sector involvement** allowed by the 2023 amendments has raised concerns about unchecked exploitation and lack of transparency.
- **Local Community's Opposition:** Fishermen's and other marine-dependent communities oppose the tendering of mining, citing threats to **livelihoods and the ecosystem**.
- **Global Resource Competition:** The rising demand for metals like cobalt, nickel, driven by **renewable energy and electric vehicle industries**, intensifies competition leading to **exploitation of resources**.
- **Climate Change:** Disturbing seafloor ecosystems could **release stored carbon**, accelerating **climate change** by increasing atmospheric **CO2 levels** contributing to **global warming**.
- **Limited Knowledge:** Offshore mining in India raises concerns due to the limited understanding of deep-sea ecosystems.
 - It remains one of the least explored and poorly understood areas, making it challenging to predict the **full environmental impact of mining activities**.
 - This uncertainty could lead to unforeseen damage to **marine biodiversity and ecosystems**, particularly as India begins exploring these resources.

Way Forward

- **Environmental Assessments:** Mandate **independent Environmental Impact Assessments (EIAs)** to evaluate the ecological, social, and economic impacts before initiating projects.
 - Adopt best practices from countries like Norway, where marine resource extraction is preceded by **rigorous environmental planning**.
- **Sustainable Mining Practices:** Limit extraction volumes, designate **no-mining zones near critical ecosystems**, and align mining with **Sustainable Development Goals (SDGs)**, particularly **climate action (SDG 13) and life below water (SDG 14)**.
- **Equitable Revenue Sharing:** Revise royalty frameworks to allocate a fair share of revenue to state governments and local communities. Establish **community development funds** for affected areas.

Drishti Mains Question:

Examine the environmental impacts of offshore mining and propose measures to mitigate risks while ensuring economic growth.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Mains:

Q. Despite India being one of the countries of Gondwanaland, its mining industry contributes much less to its Gross Domestic Product (GDP) in percentage. Discuss. **(2021)**

Q. Coastal sand mining, whether legal or illegal, poses one of the biggest threats to our environment. Analyse the impact of sand mining along the Indian coasts, citing specific examples. **(2019)**