



COASTAL EROSION - ENVIRONMENT

NEWS: In a recent Lok Sabha session, the Union Environment Ministry revealed that about one-third of India's coastline is threatened by erosion, highlighting the urgent need for comprehensive coastal management strategies.

WHAT'S IN THE NEWS?

About the Coastal Erosion

- It is a significant environmental issue affecting India's extensive coastline, which spans **over 7,500 kilometers**.
- The Indian mainland coast includes **9 coastal states and 2 Union Territories (UTs)** having 66 coastal districts.
- Morphology** of the coast consists of **43% sandy beach, 11% rocky coast, 36% of muddy flats, 10% of marshy coast**, 97 major estuaries and 34 lagoons.

Sl. No	State	Landforms and features
East coast of India		
1	Tamil Nadu	Deltas, long narrow beaches, spits, tidal flats, mangroves, coral reefs, sand dunes, Ridge swale complex etc.
2	Andhra Pradesh	Deltas, long narrow beaches, spits, mangroves, cliffs, long sand dunes, Ridge swale complex etc.
3	Odisha	Deltas, long beaches, spits, tidal flats, long sand dunes, ridges etc.
4	West Bengal	Large delta, very thick mangroves, tidal channels, islands, dunes, tidal flat, beaches etc
West Coast of India		
5	Kerala	Estuaries, lagoons, barriers, spits, dunes, tombolo, cliff, beaches etc
6	Karnataka & Goa	Estuaries, spits, sand dunes, tombolo, cliff, wave cut platforms, beaches etc
7	Maharashtra	Estuaries, cliffs, small sand dunes, tombolo, cliff, wave cut platforms, pocket beaches etc
8	Gujarat	Marshy land, tidal flats, estuaries, cliffs, mud flats, mangroves wave cut platforms, beaches etc.

- According to the **National Centre for Coastal Research (NCCR)** (an attached office of the Ministry of Earth Sciences), approximately **33.6% of India's coastline is vulnerable to erosion**, 26.9% is experiencing accretion (growth), and 39.6% remains stable.



States Prone To Coastal Erosion

•**Karnataka:** The data presented in the Lok Sabha was particularly focused on **Karnataka's Dakshina Kannada district**, where nearly 48.4% of the 36.66 km coastline has been eroded over the past three decades.

•This region's plight is a **microcosm of the broader national issue**, with varying degrees of erosion observed across different states.

Other States

•**West Bengal:** Approximately 60.5% of the state's coastline is affected by erosion, with significant impacts on the Sundarbans.

•**Kerala:** Nearly 46.4% of Kerala's coastline faces erosion, with severe consequences for local communities and ecosystems.

•**Tamil Nadu:** Erosion affects 42.7% of the coastline, posing a threat to coastal infrastructure and livelihoods.

Causes of Coastal Erosion

•Natural Factors:

•**Wave Action:** Continuous wave action erodes the shoreline, especially during high tides and storms.

•**Sea-Level Rise:** Climate change-induced sea-level rise increases the frequency and intensity of coastal flooding and erosion.

•**Storm Surges:** Cyclones and storm surges cause significant erosion, particularly in low-lying coastal areas.

•Anthropogenic Factors:

•**Coastal Development:** Infrastructure projects like ports, harbors, and seawalls disrupt natural sediment flow and exacerbate erosion.

•**Sand Mining:** Illegal sand mining from beaches and riverbeds reduces the natural replenishment of sand along the coast.

•**Deforestation:** Removal of mangroves and coastal vegetation weakens the natural defense against erosion.

Impacts of Coastal Erosion

•**Loss of Land:** Coastal erosion leads to the loss of valuable land, affecting agriculture and settlements.



- **Displacement of Communities:** Erosion forces coastal communities to relocate, leading to socio-economic challenges.
- **Damage to Infrastructure:** Roads, bridges, and buildings near the coast are at risk of damage or destruction.
- **Biodiversity Loss:** Coastal habitats, including mangroves, coral reefs, and wetlands, are degraded, impacting marine biodiversity.

Related Initiatives and Mitigation Measures

- **Integrated Coastal Zone Management Project (ICZMP):** Implemented in Gujarat, Odisha, and West Bengal, this World Bank-assisted project aims to protect and conserve coastal and marine environments through sustainable practices.
- **Coastal Regulation Zone (CRZ) Notification (2019):** It aims to conserve and protect coastal stretches, ensuring livelihood security for fisher and local communities while permitting erosion control measures.
 - It provides for **No Development Zones (NDZ)** along various categories of coastal areas to protect India's coastline from encroachment and erosion.
- **Coastal Vulnerability Index (CVI):** The Indian National Centre for Ocean Information Services (INCOIS) has developed the CVI to assess and map the vulnerability of different coastal regions based on various parameters.
- **Multi-Hazard Vulnerability Maps:** INCOIS has developed detailed maps to identify areas vulnerable to coastal hazards.

Innovative Engineering Solutions

- **Artificial Reefs:** Constructing artificial reefs can dissipate wave energy and protect the shoreline.
- **Eco-friendly Breakwaters:** Using materials that blend with the natural environment can provide effective protection without harming marine ecosystems.
- **Geo-Tube Installation:** In areas like Pentha Village in Odisha, geo-tubes have been installed to create artificial barriers that protect the coast from erosion.
- **Mangrove and Shelterbelt Plantations:** Planting mangroves and other vegetation along the coast helps stabilize the shoreline and reduce the impact of waves and storm surges.

Awareness

- **Community-Driven Conservation:** Local communities are encouraged to participate in conservation efforts, leveraging traditional knowledge and modern technology.



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•**Education and Awareness Campaigns:** Raising awareness about the importance of coastal ecosystems and the impacts of erosion can foster community support for mitigation measures.

Conclusion

- Addressing coastal erosion in India requires a multi-faceted approach that combines scientific research, community involvement, and sustainable development practices.
- By implementing effective mitigation measures and promoting awareness, India can protect its coastal regions and ensure the well-being of its coastal communities.

Source: <https://www.downtoearth.org.in/environment/coastal-crisis-environment-ministrys-lok-sabha-reply-shows-336-of-indias-coastline-is-threatened-by-erosion-2>

