# Disaster Management · GS - III

**Explain the causes and effects of coastal erosion in India. What are the available coastal management techniques for combating the hazard?**

| EXAM YEAR | PAPER | SUBJECT |
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| 2022 | GS - III | Disaster Management |

| MARKS | WORD LIMIT |
|---|---|
| 15 | ~250 words |

## Answer Hint

**Coastal erosion occurs when waves, currents and other processes remove sediment faster than it is replenished. In India, cyclones, sea-level rise, altered sediment flows and unplanned coastal development intensify the hazard. Integrated coastal-zone management, ecosystem restoration, scientific engineering and regulated development can reduce vulnerability.**

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## Model Answer

### Introduction

Coastal erosion is the progressive removal of sediments from shorelines, causing beaches to narrow and coastlines to retreat.

### Causes

Natural causes include wave action, tidal currents, cyclones, storm surges and sea-level rise. Human activities such as sand mining, construction of ports and seawalls, disruption of river sediment supply by dams, and unplanned tourism infrastructure can accelerate erosion. Vulnerable stretches occur along both the eastern and western coasts.

### Effects

Erosion damages houses, roads, ports and fishing infrastructure, displaces coastal communities and threatens livelihoods. It can cause loss of beaches, wetlands and nesting habitats, increase saline intrusion and worsen

vulnerability to storms. The resulting displacement also creates social and economic pressures.

**Coastal Management Techniques**

**1. Hard Engineering:** Sea walls, groynes, breakwaters and offshore barriers can protect selected stretches but may worsen erosion elsewhere if poorly designed.

**2. Nature-Based Measures:** Mangrove restoration, dune conservation, beach nourishment and wetland protection help absorb wave energy and retain sediment.

**3. Integrated Planning:** Coastal vulnerability mapping, hazard-based land-use regulation, early-warning systems and enforcement of Coastal Regulation Zone rules can reduce exposure.

**4. Community Participation:** Local monitoring, resilient housing and planned relocation from highly vulnerable areas can strengthen long-term safety.

**Conclusion**

India needs site-specific coastal management that combines ecological restoration with carefully assessed engineering. Integrated planning and community participation are essential for protecting coastal livelihoods and ecosystems.

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