Mains Practice Question

Q. "The process of coastal erosion and deposition creates a distinctive suite of landforms." Discuss. (150 words)

25 Nov, 2024 GS Paper 1 Geography

Approach

- Introduce by defining coastal erosion and deposition
- Give factors influencing Coastal Erosion and Deposition
- Delve into Landforms Created by Coastal Erosion
- Highlight Landforms Created by Coastal Deposition
- Conclude suitably.

Introduction

Coastal processes, including **erosion and deposition**, are dynamic forces that shape the coastline by sculpting a variety of landforms.

- **Erosion**, driven by waves, tides, and currents, removes material, while deposition occurs when sediment carried by water is laid down.
- Together, these processes create distinct coastal landscapes that are influenced by **geology, climate, and human activity.**

Body

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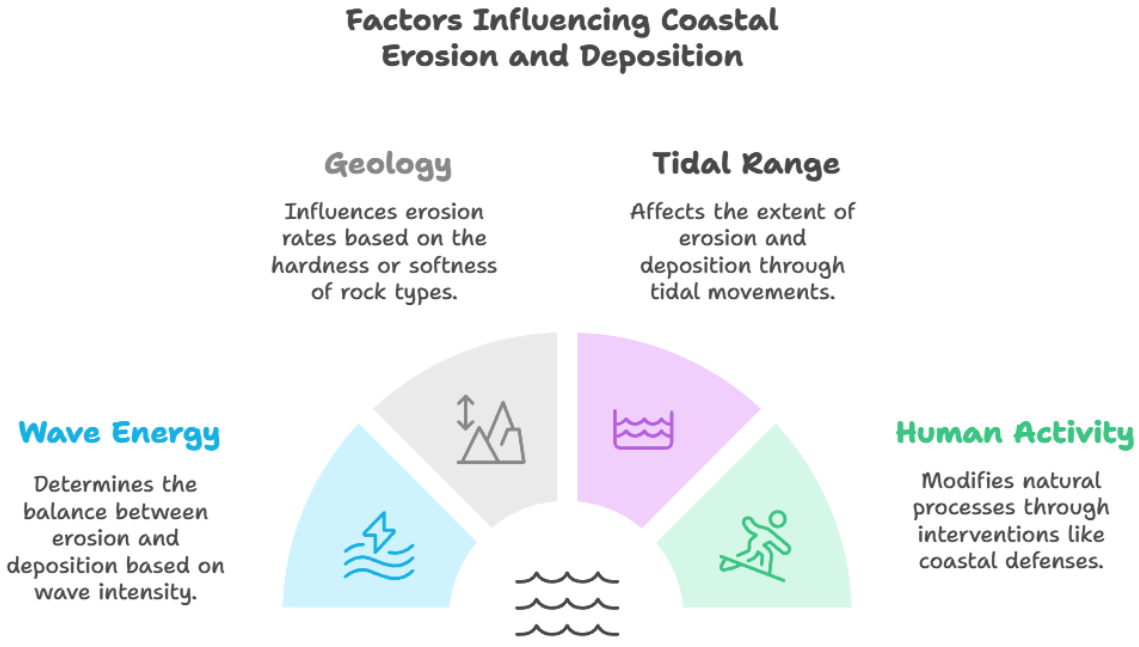

Landforms Created by Coastal Erosion:

Erosion predominantly forms rugged and dramatic landforms as follows:

- **Cliffs and Wave-Cut Platforms:** Waves erode the base of coastal rock, forming steep cliffs.
  - Repeated erosion creates a **flat platform at the base of cliffs**, known as a **wave-cut platform. (Exampl**e: Cliffs of Dover, England)
- **Sea Arches and Sea Stacks**: Continuous wave action forms caves in **headlands, which later develop into arches.**
  - When the arch collapses, it leaves isolated columns of rock called sea stacks. (**Example:** The Twelve Apostles, Australia)
- **Coves and Bays:** Softer rock erodes faster than harder rock, leading to the formation of coves and bays. **(Example:** Lulworth Cove, UK)
- **Blowholes:** Waves force water into cracks, creating **upward pressure that forms vertical shafts or blowholes. (Example:** Kiama Blowhole, Australia)

Landforms Created by Coastal Deposition:

Deposition forms gentler, more stable landforms:

- **Beaches**: Formed by the **accumulation of sand, pebbles, and other sediments** along the shore.
- **Sandbars and Barrier Islands:** Sandbars form offshore due to wave action, while **barrier islands are larger,** elongated features that protect coasts from wave energy.
- **Spits and Tombolos:** Spits are narrow ridges of sand or shingle projecting into the sea, formed by **longshore drift.** When a spit connects the mainland to an island, **it forms a tombolo.**
- **Deltas**: Depositional features formed **at river mouths where sediment carried by rivers is deposited** as they meet slower-moving water bodies. **(Example: Sunderbans Delta, India)**

Conclusion

The **interplay of coastal erosion and deposition results in a distinctive suite of landforms,** ranging from cliffs and arches to beaches and deltas. These processes are vital to understanding the **dynamic nature of coastlines** and the need for sustainable coastal management in the face of challenges like climate change and sea-level rise.