

CHAPTER - 8

ALONG THE COASTS

1. What are the factors that make the Indian coastal plains densely populated?

The coastal plains of India are densely populated due to the following reasons:

- A flat plain topography suitable for agriculture and human settlement.
- A favorable climate without extreme heat or extreme cold.
- Easy availability of water from rivers and rainfall.
- Transportation facilities and resource-rich coastlines.

2. How are 'Submerged Coasts' and 'Emerged Coasts' formed?

- **Submerged Coasts:** These are formed when the land subsides (Subsidence) due to geological activities or when sea levels rise, causing the sea to encroach upon the land. The Western Coast is an example of this.
- **Emerged Coasts:** These are formed when the land rises (Upliftment) or when sea levels drop, causing the sea to recede. The Eastern Coast is an example of this.

3. Explain the characteristic features of the three main divisions of the West Coastal Plain of India.

Answer:

The Western Coastal Plain of India

- The Western Coastal Plain is a narrow strip of land located between the Western Ghats and the Arabian Sea.
- It extends approximately 1840 km from the coast of Gujarat in the north to Kanyakumari in the south.
- The plain is characterized as a "Submerged Coast," which occurs when land subsides or sea levels rise, causing the sea to encroach upon the land.
- The average width of this coastal region is quite narrow, typically ranging between 10 km and 15 km.
- Rivers on the western coast have high velocity but low depositional levels compared to the eastern coast, resulting in fewer alluvial deposits.
- The West Coastal Plain is divided into three : The Gujarat Coast, The Konkan Coast, The Malabar Coast

The Gujarat Coast

- This region features Alang, famously known as the "Graveyard of Ships" due to its massive ship-breaking industry.
- Major industrial centers include Surat and Vadodara, which are significant hubs for the cotton textile industry.
- The coast is also home to Veraval, a major fishing harbor, and Dandi, which is of great historical importance.
- The presence of salt pans throughout the Gujarat coast is a vital part of the local economy and livelihood.

The Konkan Coast

- This section extends roughly 500 km from Daman in the north to Goa in the south.
- Because the Western Ghats run parallel and very close to the sea, the coastal plain here is exceptionally narrow.
- The northern part consists of sandy beaches, while the southern part is a "Rocky Coast" featuring cliffs, caves, and sea stacks.
- A unique geological feature is St. Mary's Island, which contains distinct hexagonal Columnar Basaltic rocks formed from ancient volcanic activity.
- Major ports like Nhava Sheva and Mormugao facilitate trade, while the region is a major center for international tourism.

The Malabar Coast

- This southern stretch extends from Mangaluru to Kanyakumari.
 - A defining feature is the extensive network of backwaters or "Kayals," such as Vembanad Lake, which is the largest in the region.
 - These backwaters are essential for inland navigation (including National Waterway 3), fishing, and tourism activities like boat races.
 - The region includes Kuttanad, famous for practicing agriculture below sea level.
 - Kochi serves as the primary commercial port, supported by other fishing harbors like Vizhinjam, Munambam, and Ponnani.
 - Ports like Kozhikode and Beypore have historical significance as ancient trading hubs for spices.
4. "The Eastern Coastal Plain of India is divided into two distinct stretches based on its geographical features and regional location. Examine this statement .

Answer

The Eastern Coastal Plain

- The Eastern Coastal Plain is located between the Eastern Ghats and the Bay of Bengal.
- It is wider and more level compared to the Western Coastal Plain.
- It is formed by the depositional activities of major rivers like the Mahanadi, Godavari, Krishna, and Kaveri.

Northern Circars

- This is the northern part of the Eastern Coastal Plain, extending from the Mahanadi delta to the Krishna delta.
- It includes the coastal regions of Odisha and Andhra Pradesh.
- **Chilika Lake**, located in Odisha, is the largest saltwater lake in India and is a major feature of this region.
- The region is known for fertile deltas formed by the Mahanadi and Godavari rivers.

Coromandel Coast

- This is the southern part of the Eastern Coastal Plain, extending from the Krishna delta to Kanyakumari.
- It primarily covers the coastlines of Andhra Pradesh and Tamil Nadu.
- **Pulicat Lake** is a significant saltwater lagoon found in this division.
- The region is home to important landmarks such as **Sriharikota** (India's satellite launch center) and the famous **Marina Beach** in Chennai.
- It features the extensive delta of the Kaveri River, which is vital for agriculture.

5. Compare and contrast the Lakshadweep and Andaman & Nicobar island groups based on their origin, location, and physical characteristics.

Answer:

The two major island groups of India, the **Lakshadweep Islands** and the **Andaman & Nicobar Islands**, have distinct differences

Lakshadweep Islands

- They are coral islands formed from the secretions of coral polyps.
- This island group is situated in the **Arabian Sea**.

- The group consists of 36 islands. Only 11 are inhabited by people.
- **Kavaratti** is the administrative headquarters and the main town of Lakshadweep.
- The islands are characterized by beautiful lagoons and relatively flat terrain.

Andaman and Nicobar Islands

- These islands are believed to be the elevated portions of submerged mountain ranges.
- This group is located in the **Bay of Bengal**.
- It is a large group consisting of approximately 572 islands.
- Only 38 of these islands are inhabited.
- The islands are divided into two main groups: Andaman in the north and Nicobar in the south.
- The Andaman and Nicobar groups are separated by the **10° Channel**.
- Due to their proximity to the equator, they have an **equatorial climate** and are covered by dense evergreen forests.
- India's only active volcano is located on **Barren Island** within this group.

6. Explain the different landforms created by the erosional and depositional activities of sea waves. Provide a brief description of at least three erosional and three depositional features.

Answer:

Sea waves act as powerful agents of gradation, constantly shaping the coastline through two primary processes: **Erosion** and **Deposition**.

Erosional Landforms

Continuous hammering by waves against coastal rocks leads to the formation of distinct landforms:

- Sea Cliff**: Steep, vertical rock faces formed when waves erode the base of a coastal mountain or hill.
- Sea Cave**: Formed when waves hollow out soft portions of a cliff over a long period.
- Sea Arch & Stacks**: When caves on either side of a headland join, they form an **Arch**. When the roof of the arch collapses, the remaining isolated rock pillar in the sea is called a **Stack**.

Depositional Landforms

When the energy of sea waves decreases, the materials they carry are deposited along the shore, creating new features :

- a) **Beaches:** These are formed by the deposition of sand, gravel, and pebbles along the coast. They are the most common depositional feature.
- b) **Sandbars & Spits:**
 - **Sandbars** are long ridges of sand formed parallel to the coastline.
 - **Spits** are sandbars that have one end attached to the mainland and the other end extending into the sea (**Screenshot (220).jpg**).
- c) **Lagoons:** When a sandbar or spit completely or partially encloses a portion of sea water along the coast, it creates a shallow salt-water lake known as a lagoon.

7. Explain how coastal regions maintain a moderate climate. Discuss the roles of Sea Breeze and Land Breeze in this process.

Answer:

Coastal regions experience a unique and moderate climate compared to other geographic areas. Even in tropical zones like India, coastal areas do not experience extreme heat or extreme cold. This is primarily due to the proximity of the sea and the different rates at which land and water heat up and cool down.

The Mechanism of Differential Heating

- Land surfaces heat up quickly during the day and cool down rapidly at night.
- Water bodies (seas/oceans) heat up slowly and cool down slowly.
- This difference in heating creates pressure variations that result in the formation of local winds known as Sea Breeze and Land Breeze.

Sea Breeze (Daytime)

- During the day, the land becomes hotter than the sea, causing the air above the land to heat up, become less dense, and rise.
- This creates a low-pressure area over the land.
- The cooler, high-pressure air from over the sea then blows toward the land to fill this gap.
- This "Sea Breeze" helps lower the daytime temperature in coastal regions.

Land Breeze (Nighttime)

- At night, the land cools down faster than the sea.
- The air over the relatively warmer sea rises, creating a low-pressure zone there.
- The cooler, denser air from the land blows toward the sea.
- This "Land Breeze" maintains the atmospheric balance and prevents extreme temperature drops on the coast.

Conclusion

The continuous cycle of Sea Breezes and Land Breezes acts as a natural air conditioner, moderating the daily atmospheric conditions and ensuring a pleasant climate for coastal inhabitants.

8. Explain the factors that influence the climate of India's coastal regions. How do land and sea breezes contribute to this?

Answer :

The climate of India's coastal regions is distinct from other geographical areas due to the influence of the sea. The key factors are:

- **Moderate Climate:** Although India's coasts are in the tropical zone, they experience a moderate climate where it is neither too hot nor too cold.
- **Proximity to the Sea:** The presence of the ocean is the primary reason for this moderate temperature, as it prevents extreme weather conditions.
- **Differential Heating:** Land and sea respond differently to solar radiation; land heats up and cools down quickly, while water heats up and cools down slowly.
- **Land and Sea Breezes:** This difference in heating creates sea breezes during the day and land breezes at night, which play a major role in regulating the daily weather conditions of the coast.
- **Monsoon Winds:** The Southwest monsoon winds originating from the Arabian Sea provide high rainfall to the western coast as they are obstructed by the Western Ghats.
- **Retreating Monsoons and Cyclones:** The eastern coast (Coromandel Coast) receives rainfall from the North East monsoon (retreating monsoon) during October and November, as well as from cyclones originating in the Bay of Bengal.

9. Explain the diversity of soil types found in the coastal regions of India.

Answer:

The coastal regions of India exhibit a variety of soil types formed through different geological processes:

- **Alluvial Soil:** Predominantly found on the East Coast due to the depositional activities of large rivers forming deltas.
- **Laterite and Red Soil:** These are commonly seen on the West Coast, often characterized by a reddish or yellowish-red appearance.
- **Coastal Alluvium and Peat Soil:** These are found in the Malabar coastal regions, formed by the deposition of river and wave sediments.
- **Saline and Coral Soil:** Areas like the Gujarat coast have saline soil, while islands like Lakshadweep are primarily composed of coral soil.

10. Classify the coastal vegetation of India based on environmental conditions.

Answer:

Coastal vegetation is categorized into two main groups based on the moisture and soil conditions:

- **Dry Coastal Vegetation:**
 - Found in sandy areas with less moisture.
 - Examples: Sand binders (creepers that hold the sand), coastal grasses, and shrubs.
- **Wet Coastal Vegetation (Mangroves):**
 - Found in marshy, saline areas like estuaries and deltas.
 - Examples: Mangrove forests, salt marshes, and various species of reeds.
 - These plants are specifically adapted to survive in saline water and tidal conditions.

11. Why is alluvial soil more prevalent on the East Coast compared to the West Coast?

Answer:

The prevalence of alluvial soil on the East Coast is due to the following geographical factors:

- **River Systems:** Large rivers like the Mahanadi, Godavari, Krishna, and Kaveri flow through the East Coast, carrying vast amounts of silt.
- **Delta Formation:** These rivers create extensive deltas, depositing fertile "Deltaic Alluvium" across the coastal plains.
- **Coastal Width:** The East Coast is generally broader, providing more space for sediment accumulation compared to the narrow West Coast.
- **Wave Action:** The nature of wave deposition on the East Coast supports the buildup of "Coastal Alluvium" in addition to river deposits.

12. Discuss the major economic activities carried out in India's coastal regions.

Answer:

The coastal regions are vital hubs for several economic activities as mentioned in the text:

- **Fishing:** This is the primary occupation for many coastal communities, supported by the proximity to the sea.
- **Agriculture:** Cultivation of crops like paddy, coconut, and various vegetables is common in the fertile coastal and deltaic soils.
- **Trade and Transport:** Modern ports and harbors facilitate international trade and the movement of goods.
- **Tourism:** The scenic beaches and unique ecosystems (like mangroves) attract tourists, contributing significantly to the local economy.