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CLASS NOTES
COASTAL PLAINS OF INDIA

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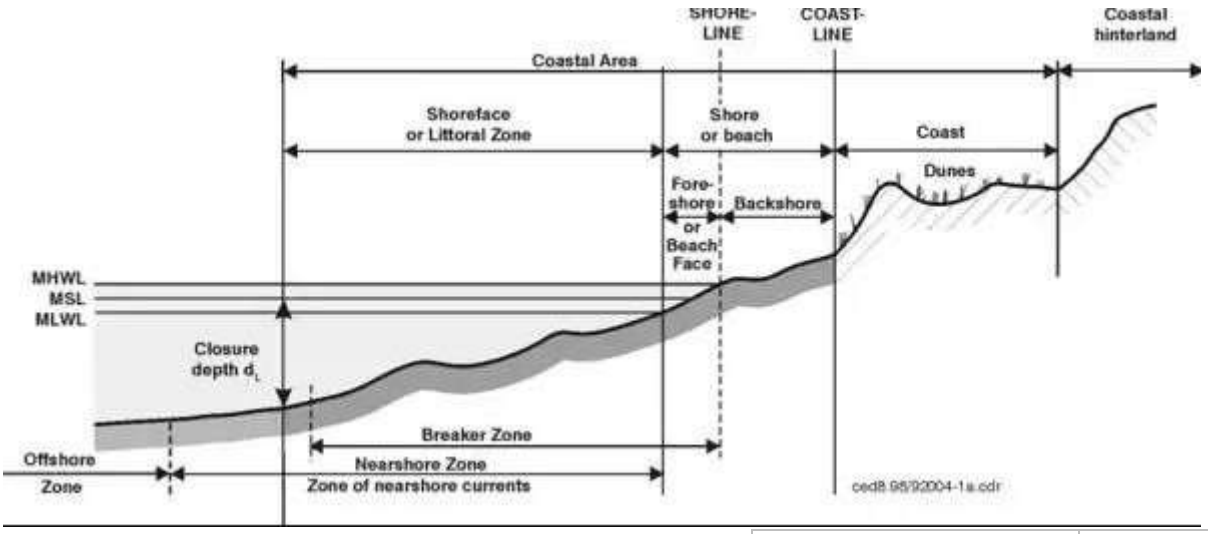


KEYWORDS

- **Coast** : Land along the sea
- **Coastline :** The boundary of the coast where land meets water.
- **Coast line** : The highest level that the sea reaches on land.
- **Shoreline:** the lowest level reached by the sea.(Here beach ends) The fluctuating line between water and the shore.
- **Shore:** The land between the coastline and the shoreline.

TWO TYPES OF COASTLINE :

Submergence Coast	Emergence Coast
Called as Retreating coast, High-Rock coast	Low sedimentary coast , gentle slope
Formed either by due to the subsidence of land or the rise of the sea level.	Formed by an uplift of the land or by the lowering of the sea level.
Erosional landforms	Depositional landforms
dominate	dominate
Coastline appears highly indented	Many deltas , Lagoons , bar ,spits, salt marshes, beaches, sea cliff, arches
Due to submergence it is narrow belt	It is wide belt, good for long beaches
Ideal location for natural ports and harbours	Artificial ports
West Coast of India; Konkan Coast (Maharashtra and Goa Coast).	East Coast of India; Coromandel coast (TN coast) and the Malabar coast (Kerala Coast).

- India West Coast is simultaneously emerging and submerging .
- Faulting has submerged the northern portion of the coast Ex Konkan Coast whereas the Southern Portion is emerged coast Ex Malabar Coast

WHAT IS INDENTED COASTLINE

- **it is irregular type of coastline (zig zag)**
- **The Coastline having many cuts or indents along their length**
- **These indents are deep**
- **The indented coastlines provide sheltered inlets, creeks and estuaries where constructing a port and maintaining it becomes easy and economical**.
- **Provides ideal location for Ports and Harbours**
- **Atlantic Ocean has indented coastline**

Ireland Capital Dublin Map Showing submergence coastline, and fjord (glacial valley :type of erosional landforms) . So Ireland and Indented coastlines of Europe provide good natural harbours, whereas African and Indian coastlines are not indented

HOW IS INDIA'S COASTLINE : INDENTED OR REGULAR ?

- **The straight and regular coastline of India is the result of faulting of the Gondwanaland during the Cretaceous period (Continental Drift)**
- **As such the coast of India does not offer many sites for good natural harbours.**
- **The Bay of Bengal and the Arabian Sea came into being during the Cretaceous or early Tertiary period after the disintegration of Gondwanaland.**

HOW LAGOONS ARE FORMED ?

- **A lagoon is a shallow body of water protected from a larger body of water (usually the ocean) by sandbars, barrier islands, or coral reefs.**
- **They are formed due to depositional features ; when a coastal sand deposit creates a barrier that traps water.**
- **Formed in Emergent Coastline Region Ex Coromondal Coast and Malabar Coast**

Examples :

- **New Caledonian Barrier Reef lagoon** - South Pacific , France : Largest Lagoon in the World
- **Marovo Lagoon** is the largest saltwater lagoon in the world (Solomon Islands)
- **Chilika Lagoon** : largest coastal lagoon in India (Asia Biggest Brackish water lagoon) Located at 19 Degree North latitude and part of three district (spread over the Puri, Khordha and Ganjam districts of Odisha state on the east coast of India, at the mouth of the Daya River, flowing into the Bay of Bengal)
- **Pulicat Lake Lagoon** : Second largest lagoon in India ; Located at 13 Degree North Latitude, Part of Coromandal Coast and located between Andhra Pradesh- Tamilnadu border .
- **Kaliveli Lake:** Coastal lake Lagoon in Viluppuram District Tamilnadu (Coromandal Coast) located 12 Degree North Latitude

About Minicoy

- located on eight degree North latitude
- It is the second largest and southern most island in Lakshadweep, crescent shaped and has one of the largest lagoons

WHY KERALA FAMOUS FOR BACKWATER LAGOONS?

- **Malabar Coast of Kerala is Coastline of Emergence**
- **Hence it is characterized by gentle topography facilitating backwater lagoons when the river join the sea**

Example :

- **Vembanad-Kol Wetland** is a complex of lagoons, lakes, and rivers spread across the districts of Alappuzha, Kottayam, and Ernakulam. It is the largest lagoon system in Kerala
- **Asthamudi Lake**: Located in the Kollam district of Kerala, Asthamudi Lake is the second-largest lake in Kerala and is connected to the Arabian Sea
- But **Sasthamkotta Lake** is largest freshwater

What is Coral Lagoon :

- Coral Lagoon or Atoll Lagoon : Like coastal lagoons but are seperated from the main body of water by coral reefs. Ex Minicoy island of Lakshdweep

COASTLINES OF INDIA

- India's EEZ Borders with Eight Countries : Pakistan , Maldives, Srilanka, Bangladesh, Myanmar, Thailand, Malaysia Indonesia.
- The coastal economy also sustains over 4 million fisherfolk and other coastal communities.
- Length of coastline : 7516.6 km, Including Mainland India : 5422.6 km Island Territories: 2094 km
- The coastline of India touches 13 states and Union Territories.

States	Coastline Length
Gujarat	1,214.7 Kms
Andhra Pradesh	974.0 Kms
Tamil Nadu	906.9 Kms
Maharashtra	652.6 Kms
Union Territory	
Andaman & Nicobar Islands (UT)	1,962 Kms

State-wise Length of Coastline of India

Length of India's Coastline		
State (9) / UT (4)		Length (in km)
1	Andaman and Nicobar Islands	1962
2	Gujarat	1214.7
3	Andhra Pradesh	973.7
4	Tamil Nadu	906.9
5	Maharashtra	652.6
6	Kerala	569.7
7	Odisha	476.4
8	Karnataka	280
9	Goa	118
10	West Bengal	157.5
11	Lakshadweep Islands	132
12	Puducherry	30.6
13	Dadra-Nagar Haveli & Daman-Diu	42.5
Mainland Coastline		5422.6
Islands Coastline		2094
Total Coastline		7516.6

News :

India's coastline has grown by **47.6%**, from **7,516 km in 1970** to **11,098 km in 2023-24**. The increase is due to the adoption of new methodologies for measuring coastal features.

Comparison: Old vs. New Measurement Methodology

Aspect	Old Methodology (1970)	New Methodology (2023-24)
Basis of Measurement	Straight-line distances	Included complex coastal formations
Coastal Features Measured	Limited to general shoreline length	Incorporated bays, estuaries, inlets, and other geomorphological features
Technology Used	Basic tools and manual calculations	Advanced geospatial technologies and mapping tools
Accuracy	Relatively less precise	More precise representation of dynamic coastline
Reported Coastline Length	7,516 km	11,098 km

Statewise Length-New(old) in km

1.Gujarat -2340.62 (1217.7)
2.Tamil Nadu-1068.69 (906.9)
3.Andhra Pradesh- 1053.07 (973.7)
4.Maharashtra- 877.97 (652.6)
5.West Bengal- 727.02 (157.5)
6.Kerala- 600.15 (569.7)
7.Odisha- 574.71 (464.4)
8.Karnataka- 343.3 (280)
9.Goa- 193.95 (101)

In Union Territory

1.A & N -3083.5 (1962)
2.Lakshadweep- 144.8 (132)
3. Daman & Diu (DNDD)- 54.38 (42.5)
4. Puducherry UT(Incl all 4 parts)- 42.65 (47.6 km).

CRITERIA	WESTERN COASTAL PLAINS	EASTERN COASTAL PLAINS
Lies Between	Arabian Sea & Western Ghats	Bay of Bengal & Eastern Ghats
Stretch	Gujarat (mainly from Rann of Kutchh) to Tamil Nadu (mainly Kanyakumari)	Odisha (mainly from Mahanadi river) to Tamil Nadu (mainly Cauvery Delta)
Formation	Submergent coastal plain	Emergent Coastal Plain
Width	Narrow Belt & provides natural conditions for development of ports & harbours. Eg. JNPT, Kandla etc.	Broader & Continental Shelf extending up to 500 km into the sea making it difficult to develop good ports / harbours
Delta Formation	River flowing don't form any Delta. Major Estuaries - Narmada & Tapi.	Well developed Deltas, including deltas of Mahanadi, Godavari, Krishna & Kaveri.
Division	Kachchh & Kathiawar Coasts - Gujarat Konkan Coast - Maharashtra & Goa Malabar Coast - Karnataka & Kerala	Utkal coast - Odisha Coromandel Coast - Tamil Nadu & parts (Payan ghat) of Andhra Pradesh
Important Lakes	Malabar Coast (Kerala) has some lakes, lagoons & Backwaters, largest being Vembanad lake.	Utkal Plains, south of Mahanadi Delta - Chilika Lagoon (Largest Brackish water Lagoon of Asia); Pulicat Lake (2nd Largest brackish water lagoon of India) Kolleru Lake - between deltas of Godavari & Krishna
Other features	'Kayals' (backwaters) - distinguishing feature - Malabar coast. Famous - for Nehru Trophy - Vallamkali (boat race)	Sriharikota Island Wheeler (Dr. APJ Abdul Kalam) Island.

WESTERN COASTAL PLAINS OF INDIA

- Extends from Rann of Kachchh, Gujarat to Kanyakumari.
- Length : about 1500 km
- These are narrow plains with an average width of about 65 km.
- The western coast is narrow in middle and gets broader in north and south.
- The rivers in Western Coast do NOT form DELTA.
- The western coast is narrower than the eastern coast.(Reason Submergence coast)
- Due to its submergence, it is a narrow belt and

The western coast is further divided into four categories from North to South

1**. Gujarat coast plains** : Kachchh & Kathiawar coast - . Shaped by the rivers Narmada, Tapti, Mahi, and Sabarmati, this plain covers southern Gujarat and the coastal areas of the Gulf of Khambhat. While the eastern part is fertile, most coastal areas are covered by windblown loess, resulting in a semi-arid landscape.

2 Konkan coast

- In Maharashtra, between Daman in the north to Goa Malabar Plain (Kerala Plain)
- The Kerala Plain is also known as the Malabar

provides natural conditions for developing ports and harbours.

- Kandla, Mazagaon, JLN Port Nava Sheva, Marmagao, Mangalore, Cochin, etc., are some of the important natural ports located along the West Coast
- The West Continental Shelf is at its widest off the Bombay coast. This place is rich in oil.
- Along the Malabar Coast, there are many beautiful lagoons which makes the place a tourist destination.

in the south.

- it has subducted coastline and has erosional features
- Number of creek and estuaries developed here
- It has some features of marine erosion including cliffs, shoals, reefs and islands in the Arabian Sea.
- The Thane creek around Mumbai is an important embayment (a recess in a coastline forming na bay) which provides an excellent natural harbour.
- Rice and cashew

3. Karnataka Coastal Plain

- Goa to Mangalore.
- It is a narrow plain with an average width of 30-50 km, the maximum being 70 km near Mangalore.
- It is submerged coast and has iron deposits
- At some places the streams originating in the Western Ghats descend along steep slopes and make waterfalls.
- The Sharavati while descending over such a steep slope makes an impressive waterfall known as Gersoppa (Jog) Falls which is 271 m high.

Plain.

- Between Mangalore and Kanniyakumari.

- This is much wider than the Karnataka plain. It is a low-lying plain.
- it is Emergent coast and has depositional features .
- The existence of lakes, lagoons, backwaters, spits, etc. is a significant characteristic of the Kerala coast.
- The backwaters, locally known as kayals are the shallow lagoons or inlets of the sea, lying parallel to the coastline.
- The largest among these is the Vembanad Lake which is about 75 km long and 5-10 km wide
- The famous Nehru Trophy Vallamkali (boat race) is annually held in Punnamada Kayal (Punnamada Lake), a southern extension of the Vembanad Lake in Kerala

EAST COAST OF INDIA

- Lies between the Eastern Ghats and the Bay of Bengal.
- Extending from Subarnarekha river along the WB-Odisha border to Kanyakumari
- This plain is known as the Northern Circars between the Mahanadi and the Krishna rivers and as Carnatic between the Krishna and the Cauvery rivers.
- It is marked by deltas of rivers like the Mahanadi, the Godavari, the Krishna, and the Cauvery (fertile , productive region , more population region)
- the delta of the River Krishna is called the 'Granary of South India'.
- Chilka lake and the Pulicat lake (lagoon) are the important geographical features of the east coast.
- Because of the emergent nature , it has less number of ports . The Continent shelf extends up to 500km into the sea, which makes it difficult for the
- development of good port and harbours.

The Eastern coast is again divided into three categories:

- **Utkal coast:** The Utkal Plain comprises the coastal areas of Odisha and includes the Mahanadi Delta. A notable feature of this plain is the Chilka Lake, the largest brackish water lake in India.
- **Andhra coast:** The Andhra Plain is situated south of the Utkal Plain and extends to Pulicat Lake. Pulicat Lake is blocked by Sriharikota Island, which is used as an ISRO launch site
- The key feature of this plain is the delta formed by the Godavari and Krishna rivers. The two deltas have merged and formed a single physiographic unit.
- Recently, the combined delta moved toward the sea, shifting Kolleru Lake from a coastal lagoon to an inland position.
- The Andhra Plain coast is straight and lacks good harbours, except for Vishakhapatnam and Machilipatnam.

Coromandel coast:

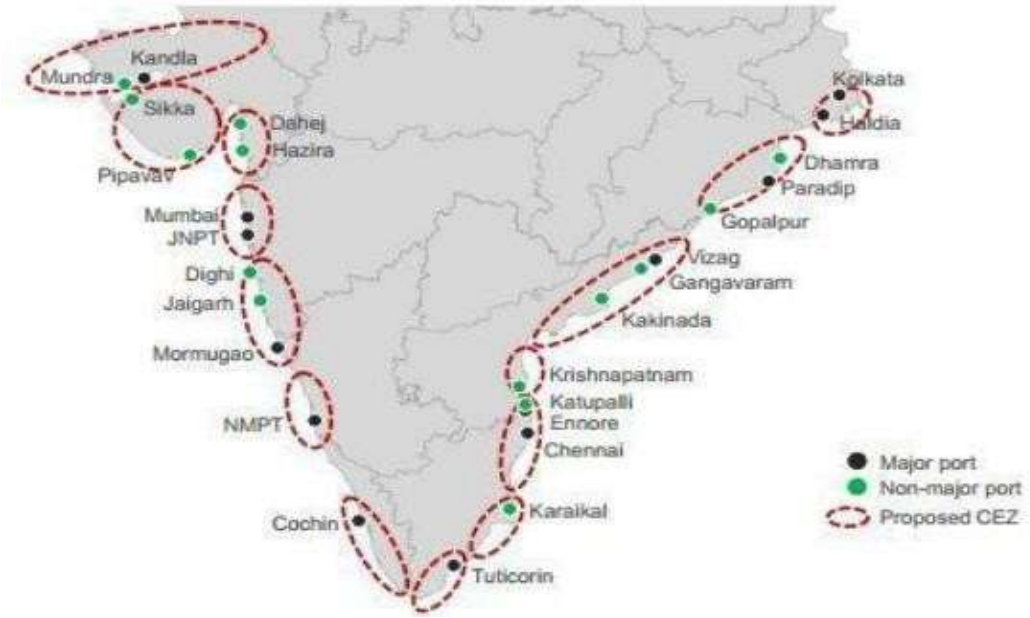
- Tamil Nadu Plain extends from Pulicat Lake to Kanyakumari with an average width of 100 km
- Its most significant feature is the Cauvery Delta " South India's granary"
- Coromandel Coast or Payan Ghat: The combined region of the Tamil Nadu Coast and parts of the Andhra Coast.
- This Indian coastline remains dry in summer andreceives rainfall during the winters due to the north-east monsoons.

Key Region of East Coast Plains Extends between

Utkal Coast	between the Chilika Lake and Kolleru Lake
Andhra coast	between the Kolleru Lake and Pulicat Lake
Northern Circars	between the Mahanadi and the Krishna rivers
Carnatic	between the Krishna and the Cauvery rivers
Coromandel coast	extends between Pulicat Lake and Kanyakumari

The Significance of the Coastal Plains

- ✓ **Fertile Soil for Agriculture:** Rice is a major crop grown in these areas. Coconut trees thrive along the coastline.
- ✓ **Mineral Oil Deposits:** Sedimentary rocks in these plains are believed to contain substantial deposits of mineral oil.
- ✓ **Monazite Reserves:** The sands along the Kerala coast contain significant quantities of monazite, a material used in **nuclear power**.
- ✓ **Salt Production:** Low-lying areas in Gujarat are famous for salt production.
- ✓ **Tourist Destinations:** Beaches and backwaters are significant tourist attractions.
- ✓ **Ports for Trade**
- ✓ **Fishing Industry**



MAJOR PORTS IN INDIA :

- India's 95% of trading by volume is done through maritime transport. It stands at 70% by value.
- India has 13 major ports and 205 notified minor and intermediate ports.
- 12 government-owned and one privately-owned port,
- Among the 12 government-owned ports, six are situated along the western coast, while the remaining six are located on the eastern coast of the country.

The majority of ports in India are located in the below-given states:

1. Maharashtra -53
2. Gujarat -40
3. Tamil Nadu – 15
4. Karnataka – 10

Syama Prasad Mookerjee Port/ Kolkata Port / Diamond Harbour	West Bengal Oldest Port In India	India's only major porton Hugli Riverine river
Paradip Port	Odisha's Jagatsinghpur district	Natural Port
Visakhapatnam Port	Andhra Pradesh	natural harbor Deepest port of India
Kamarajar Port or Ennore Port	Coromondal Coast Tamilnadu	only corporatised major port of India
Chennai Port	Tamilmadu	Artificial Port
V.O. Chidambaranar Port/ Tuticorin Port	Tamilnadu	
Cochin Port	Kerala	Willingdon Island and Vallarpadam Island in Kochi's Lake
New Mangalore Port	Karnataka	
Mormugao Port	Goa	
Mumbai Port	Largest Port by size and Second oldest port	The busiest port in India
Jawaharlal Nehru Port or Nhava Sheva Port	Maharastra	India's largest container- handling port
Deendayal Port: Kandla Port	Kutch Gujarat	Tidal Port, Biggest Cargo Handling port of India - Free Trade Zone

Note :. Krishnapatnam Port

- Private port
- is known as the deepest port in India
- Located on East coast
- Nellore District of Andhra Pradesh
- It is located about 190 km north of the Chennai Port
- The port has its history back to Vijayanagar Emperor, when Sri Krishnadevaraya used to operate it. So, the name was given to itas *Krishnapatnam Port*.

Tamil Nadu has the highest number of major ports in India.

The list of eastern coast ports in India is given below:

- Chennai Port in Tamil Nadu
- Ennore Port in Tamil Nadu
- Kolkata Port in Kolkata
- Paradip Port in Orissa
- V.O.Chidambaranar Port (also called Tuticorin port) in Tamil Nadu
- Vishakhapatnam Port in Andhra Pradesh(News: Vadhavan Port will be the 13th Major Port in India. This port has been planned by JNPT as an "All weather, All Cargo and Satellite", to enhance the capabilities of JNPT.

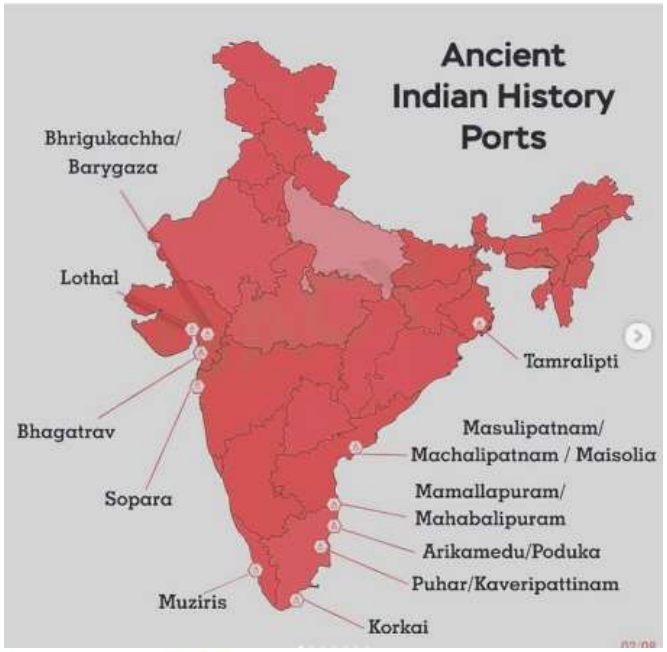
State	Place	Port
Kerala	Vizhinjam	Vizhinjam International Seaport
Tamil Nadu	Colachel	Colachel Seaport
Maharashtra	Vadhavan(near Dahanu)	Vadhavan Port
Karnataka	Tadadi	Tadadi port
Andhra Pradesh	Machilipatnam	Machilipatnam Port
West Bengal	Sagar Island	Sagar Island Port

- Bharuch, Gujarat
- Muziris, Kerala
- Kozhikode, Kerala
- Chaul, Maharashtra
- Haldia, West Bengal
- Goa, Goa
- Surat, Gujarat
- Calicut, Kerala
- Cochin, Kerala
- Diu, Daman and Diu
- Pondicherry, Puducherry
- Gopakapattana, Goa

NEW PORTS UNDER DEVELOPMENT : Six new mega ports are to be developed underthe Sagarmala Project.

ANCIENT AND MEDIEVAL PORT OF INDIA

- Lothal, Gujarat
- Dholavira, Gujarat
- Arikamedu, Tamil Nadu
- Mahabalipuram, Tamil Nadu
- Poompuhar, Tamil Nadu
- Kaveripattinam, Tamil Nadu
- Mamallapuram, Tamil Nadu
- Qusad Creek, Gujarat



DISCUSS THE IMPORTANCE AND ISSUES OF COASTAL PLAINS

Coastal plains hold significant importance for several reasons:

Economic Importance: Coastal plains often have fertile soil, making them ideal for agriculture. They are often used for growing crops such as grains, vegetables, and fruits, which contribute to local and national economies. Additionally, coastal plains are often rich in mineral resources such as oil, natural gas, and minerals like sand and gravel, which can be extracted for economic benefit.

Ecological Importance: Coastal plains are home to a wide array of plant and animal species, making them important for biodiversity and ecological balance. They provide habitats for various wildlife, including birds, fish, and mammals. Coastal plains also contain wetlands and estuaries, which act as nursery grounds for many marine species.

Tourist Attractions: Coastal plains are often attractive tourist destinations due to their natural beauty, beaches, and recreational activities such as fishing, boating, swimming, and water sports. The tourism industry that develops around coastal plains can significantly contribute to the local economy.

Transportation and Trade: Coastal plains frequently serve as transportation hubs due to their proximity to water bodies. They provide easy access to ports and harbors, facilitating international trade and commerce. Coastal plains also often have well-developed Infrastructure, including highways, railways, and airports, which further enhances their significance as transportation and trade centers.

Coastal Protection: Coastal plains play a crucial role in protecting inland areas from erosion, storm surges, and tidal waves. They act as a natural buffer and absorb the impact of storms, protecting coastal communities and infrastructure. Coastal plains also serve as natural barriers against rising sea levels, helping prevent flooding and property damage.

KEY ISSUES:

- **Flooding:** Coastal plains in India are prone to frequent and severe flooding due to heavy monsoon rains, leading to loss of life and property damage.
- **Erosion:** The constant pounding of waves and tides erodes the coastline, which can result in loss of land and displacement of coastal communities.
- **Tsunamis:** Coastal plains are highly susceptible to tsunamis, which can cause widespread destruction and loss of life.
- **Saline intrusion**: Coastal plains often experience saline intrusion, where saltwater from the sea infiltrates freshwater sources, making them unfit for irrigation and drinking purposes.
- **Cyclones:** Coastal plains are vulnerable to cyclones, which can cause significant damage to infrastructure, agriculture, and livelihoods.
- **Coastal pollution**: Increased industrialization and urbanization along coastal plains result in the discharge of pollutants into nearby maritime ecosystems, leading to the degradation of marine life and habitats.
- **Coastal erosion**: Beaches are under constant threat of erosion due to rising sea levels, leading to loss of natural beauty and recreational activities.
- **Soil degradation:** Overexploitation of coastal plains for agriculture and infrastructure development can lead to soil erosion and degradation, affecting the productivity and sustainability of land.
- **Climate change**: Rising sea levels and increased intensity of extreme weather events due to climate change pose a significant threat to coastal plains in terms of increased erosion, flooding, and loss of coastal biodiversity
- **Destruction of mangroves:** Coastal plains often have mangrove ecosystems, which act as natural buffers against storm surges and provide breeding grounds for marine organisms. However, these ecosystems are often cleared for various economic activities, leading to their destruction.
- **Loss of biodiversity**: Coastal plains are home to diverse ecosystems, including coral reefs, estuaries, and wetlands. However, habitat destruction, pollution, and overfishing threaten the rich biodiversity found in these areas.
- **Coastal population growth**: Rapid population growth in coastal plains leads to increased pressure on limited resources and infrastructure, resulting in challenges related to housing, sanitation, and waste management.
- **Decline in fish populations**: Overfishing and destructive fishing practices in coastal plains have led to a decline in fish, and Mangrove deforestation
- **Tourism pressures**: Coastal plains in India attract a large number of tourists, leading to overcrowding, pollution, and strain on local resources and infrastructure.
