# Agriculture and fishery are the two major industries for livelihood and source of income for the local people.

# Activities of ports and harbours are taking place in the north Karnataka coast with one major port at Mangalore and ten minor ports in other areas.

#The Karnataka coast has different geomorphological features which include several river mouths, lagoons, bays, creeks, cliffs, spit sand dunes, and long beaches.

# Major problems that the coast has been facing i.e.,erosion, migration of river mouths, siltation of ports and harbours.

# Fourteen rivers that drain into the Karnataka coast

# The important estuaries of the region are Netravati-Gurpur, Gangoli, Hangarkatta, Sharavthi, Aganashini, Gangavali and Kalinadi.

#Some of the currently inhabited islands include Arge Island, Basavaraja Durga Island, Netrani (Pigeon Island), Kodithale Island, Bhattan Kudru, and Bal Kudru, along with three others whose names are unknown. The majority of these islands are less than 2 square kilometers in area.

# Approximately 90% of these islands fall within Uttara Kannada and Udupi districts, with a few in the coastal and riverine environments of Dakshina Kannada district.

- Karnataka's coastline is 320 km long.

- It features river mouths, lagoons, bays, creeks, cliffs, sand dunes, and long beaches.

- The continental shelf off Karnataka's coast averages 80 km in width, with the shelf break occurring at depths of 90 to 120 meters.

- Around 30% of the coastline experiences moderate soil erosion, while 16% faces severe erosion, with Dakshina Kannada and Udupi districts showing the most severe erosion.

The erosion problem has been observed more severe in costline of Dakshin Kannada and Udupi districts.

Erosion along the coastline occurs in three main forms: along open beaches, at the mouths of rivers and estuaries, and at tidal reaches of rivers.

**Effects of coastal erosion in various domains in Karnataka**

**Land Loss**: Coastal erosion is causing the loss of valuable land, especially in the heavily affected Dakshina Kannada and Udupi districts. This results in reduced agricultural land and space for development.

**Infrastructure Damage**: Erosion has led to damage to critical infrastructure including roads, buildings, and coastal protective structures. This not only incurs repair costs but also disrupts transportation and connectivity.

**Community Displacement**: Villages and towns along the coast, such as those in Dakshina Kannada and Udupi, face the threat of displacement as erosion encroaches upon inhabited areas, forcing people to move and impacting their livelihoods.

**Ecological Impact**: Coastal ecosystems, including mangroves, estuaries, and beaches, are being degraded. This affects biodiversity, disrupting habitats for various marine and coastal species.

**Increased Flooding and Storm Damage**: The loss of natural barriers due to erosion makes coastal areas more susceptible to flooding and damage from storms. This increased vulnerability poses a risk to both people and property.

**Economic Consequences**: The tourism industry is particularly affected as erosion degrades beaches and coastal attractions, leading to a potential decline in tourist visits. Additionally, fisheries can be impacted by changes in coastal and marine environments, affecting the livelihoods of local fishermen.

**Agricultural Impacts**: Saltwater intrusion into agricultural lands due to erosion and the breaching of natural barriers can reduce soil fertility and crop yields, adversely affecting local farming communities.

**Human impacts which leads to Coastal Erosion:**

**Alteration of Natural Landscapes**: Building infrastructure such as roads, buildings, and ports can disturb the natural coastal landscapes and lead to increased erosion.

**Reduction of Vegetation**: Removing vegetation for development decreases the natural barriers that protect shorelines from erosion.

**Depletion of Beaches**: Extracting sand for construction and other uses directly removes material from beaches and coastal systems, accelerating erosion.

**Sea Level Rise**: Human-induced climate change is causing sea levels to rise, which increases the rate of coastal erosion.

The Karnataka state has twelve minor ports between Karwar in the north and Mangalore in the south which include Karwar, Belekeri, Tadri, Pavinakuruva, Honnavar, Manki, Bhatkal, Kundapur, Hangarkatta, Malpe, Padubidri and old Mangalore.

Out of these ports, Karwar is the only all weather port designed for handling of all types of commodities including petroleum products, while the other ports are riverine anchorage lightarage ports.



People living by the coast make their living mainly from fishing (including shellfish), collecting sand, and gathering lime shells. Farming also plays a big role, with rice being the main crop grown in the coastal wetlands. There's a wider variety of rice grown here compared to other areas of Karnataka.

Several human activities are happening along the Karnataka coast. These include ports, harbors, mining, fish farms, boat repairs, tourist resorts, and businesses.

From factories, ships, and even boat repairs, pollutants like chemicals, waste, and oil contaminate the water, harming marine life.

Building ports, resorts, and fish farms destroys natural habitats like mangroves and wetlands, which are crucial for coastal ecosystems.

Overfishing and sand mining deplete natural resources and disrupt the delicate balance of the coastal environment.

Sand mining around riverine islands is causing erosion and affecting the island ecosystems.

The Udupi coast is highly vulnerable to sea level rise (SLR) due to its low topography and significant ecological and tourism value.

Coastal Vulnerability Index (CVI) for Udupi coast:

59% of the coastline is at very high risk

7% is at high risk

4% is at moderate risk

30% is at low risk

- The coastal districts of Karnataka are highly biodiverse due to numerous rivers, estuaries, and the Western Ghats' hilly environment.

- Dominant pelagic fishery resources include mackerels, sardines, anchovies, and other clupeids.

- Deep sea fishing includes catfishes, Sciaenids, perches, and sharks.

- Coastal regions have 14 species of mangroves from 8 families, with dominant species including:

- Rhizophora mucronata

- Acanthus ilicifolius

- Acrostichum aureum

- Aegiceras corniculatum

- Avicennia marina

- Avicennia officinalis

- Bruguiera cylindrica

- Riverine islands feature mangrove species like:

- Acanthus Ilicifolius

- Acrostichum Aureum

- Aegiceras corniculatum

- Avicennia alba

- Avicennia officinalis

- Rhizophora mucronata

- Sonneratia alba

- Sonneratia caseolaris

- Netrani Island hosts fringing corals with 14 coral species, 4 sponge species, 15 bivalve species, 48 gastropod species, and 8 nudibranch species.

- Threatened species on Netrani Island include:

- Endangered grouper fish (Cheilinus undulatus)

- Vulnerable species (Rhincodon typus)

- St. Mary’s Island has:

- 390 marine fish species

- 3 sea turtle species

- 4 whale species

- 4 dolphin species

The coastal zone of Dakshina Kannada and a part of Udupi districts which is the densely populated zones in India. extends for over 120 km ,from Lat.12 degrees 45 minutes-13 degrees 45 minutes North and long.74degrees35 minutes- 74 degrees 55 minutes East.

This study examines how natural shoreline processes and man-made structures affect beach stability in Dakshina Kannada and part of Udupi districts. It aims to provide accurate estimates of beach erosion for various practical purposes, using data on short-term changes in beach shape over different seasons and years. The study also suggests easy and affordable solutions to reduce erosion caused by southwest monsoon waves, offering valuable information for managing the coastal zone in the area.

Beaches adjacent to coast parallel rivers are also more vulnerable to erosion due to shallow water tables that exist when rivers flow full in monsoon.

Human interference includes mainly construction of coastal structures and sand mining.Seawalls and break waters are the predominant coastal structures of this region.

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