



# **Managing Coastal Margins**

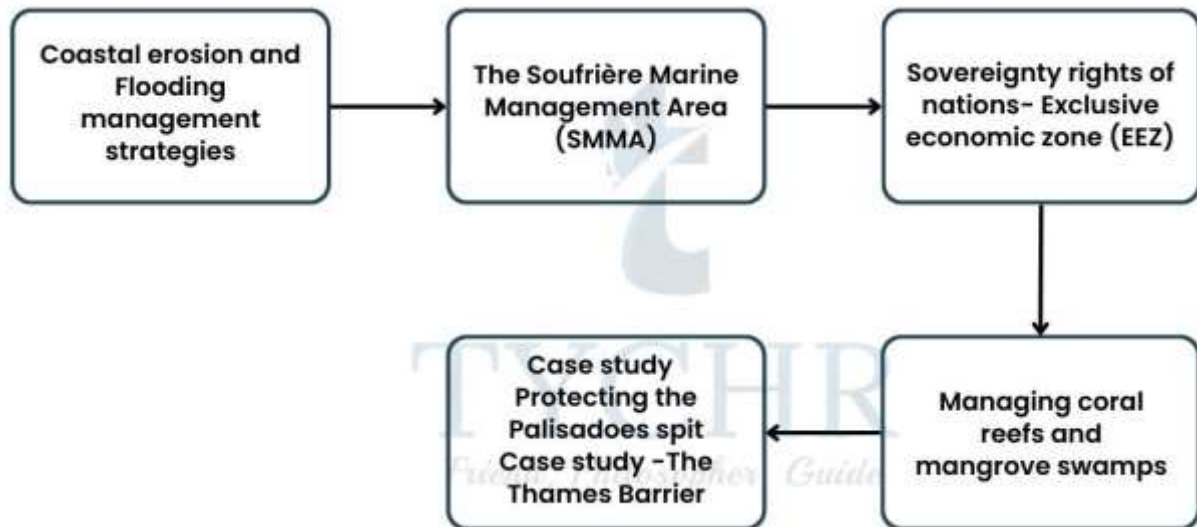


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# MANAGING COASTAL MARGINS

## Approaching The Topic:

- Topics covered in the chapter:
  - Defining concepts
  - Differentiating certain concepts



### 3.1. Coastal Erosion And Flooding Management Strategies

- Cliff failure: Cliffs collapse for a number of reasons, including the rate and type of weathering acting upon the front edge of the cliff or the cliff face, and the rate and type of erosion occurring at the cliff base. These 2 cycles are subject to different elements including:
  - The material of the coastline—weak clays will collapse more quickly than granite that is more solid
  - the size and strength of the waves that attack the coastline

The structure of the rock – rocks with vertical faults and horizontal bedding planes are more susceptible to erosion.

### 3.2. Cost-Benefit Analysis Of Coastal Defence:

The coastal areas are affected by many hazards. The cost includes:

- Cost of building, it covers the cost of infrastructure like gas, water, sewage, electricity services.
- Maintenance and repair of the infrastructure, roads etc.
- Making the beaches less available during work.
- Employing people for coastal defence works
- Ultimate motive is to provide peace of mind to the residents.
- Building structures like Sea walls, Gabions, Groynes, Rock armour etc. to control the natural processes around the coast line.

### 3.3. Conflicting Pressures On Coastlines: The Soufrière Marine Management Area (SMMA):

The Soufriere Marine Management Area, or SMMA for short, is an example of how a fragile coastal environment can be managed. The Soufriere Coast is a stretch of coastline on the west coast of St. Lucia, an island in the Southern Caribbean, approximately 400 km north of South America.

#### **What is fragile about the Soufriere Coast?**

St Lucia is home to a number of coral reefs. Unfortunately, coral reefs are at risk from human activities such as fishing, farming and diving. A study in 2008 estimated that 50% of the world's coral reefs had been so badly affected by human activity that they could be dead in 40 years.



Figure 1.1- Soufrière Town

### **So what were humans doing to the Soufriere Coast?**

- The water was degrading, putting human health at risk, as well as the coral reefs. Much of this was the result of sewage and waste being dumped directly into the sea.
- Overfishing (too many fish being caught) near the shore was reducing the number of fish, harming the fishing industry (no fish = no fishing) and putting the coral at risk (the fish eat harmful algae from the reef. No fish = more algae).
- Polluted (dirty) beaches.

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Figure 1.2- Coral Reef-Soufriere Coast

### **What was the response?**

In 1992, various organisations in St. Lucia, including the National Trust for St. Lucia and the Soufriere Regional Development Foundation (an NGO) got together with the government and agreed to tackle four main issues:

- Controlling the increased yachting along the coast
- Setting up marine reserves (nature reserves in the sea) Developing fishing
- Managing pollution

### **How did they do this?**

They zoned the coast. As the map, they divided the coast into different sections.

- The green areas are nature reserves,
- The pink areas for fishing
- The purple areas for yachting and
- The yellow areas to be used by everyone.

They also marked particular sites for SCUBA diving (see the key) and for recreation and leisure. This was called the Soufrière Marine Management Area (SMMA).

### 3.4. Managing Coral Reefs And Mangrove Swamps:

Coral reefs are often described as the “rainforests of the sea” on account of their rich biodiversity.



Flourishing mangroves along Karachi coast, Pakistan

**3.4.1. Environmental and economic value of coral reefs:** Coral reefs support jobs, tourism, and fisheries. From tourism to marine recreation and sport fishing, coral reefs play an important role in the economies of countries all over the world, from tourism to marine recreation and sport fishing. One estimate suggests that coral reefs provide annual goods and services worth approximately \$375 billion to the economy.

- Coral reefs provide many advantages. These include the following.
  - In the ocean, they absorb wave energy and contribute to environmental protection through the reduction of coastal erosion.
  - A source of food: A quarter of the average amount of fish caught in these nations comes from reef animals, which are an important source of protein. Between 5 and 15 tons of fish, crustaceans, mollusks, and other invertebrates can be found per square kilometer in a “well managed” reef.

- An economic importance: According to one estimate, the total annual earnings of coral reefs in the world is \$29, 8 billion. \$9.6 billion is spent on leisure and tourism, \$9 billion on coastal protection, \$5.7 billion on fishing, and \$5.5 billion on biodiversity.
- A tourism wealth: The reefs are often an essential element in the economy of tropical regions they inhabit. In effect, they draw free divers, recreational fishermen, divers, and beachgoers who enjoy white sand beaches.
- A medical future: Certain cancers, including leukaemia, HIV, cardiovascular diseases, and ulcers are treated with reef organisms.

**3.4.2. Mangrove swamps :** Mangrove swamps are coastal wetlands in tropical and subtropical regions. They are characterised by salt-loving halophytic trees, shrubs, and other plants that thrive in brackish to saline tidal waters.

- Mangroves are under attack: At the end of the 20th century, less than 50% of the world's mangrove forests were intact, and half of those that are still there, are in poor condition, according to some estimates. Mangrove forests are one of the world's most endangered habitats, and mangrove loss is widespread worldwide. The tourism industry's ever-increasing growth, pollution from fertiliser and pesticide runoff, and improper waste disposal have been the most significant regional threats to mangroves in recent years.
- Managing mangrove forests: The following principles can be used as a guide when preparing management plans for mangroves:
  - Wood, non-wood and aquatic resources are managed in an integrated way and used to meet local, regional or national needs.
  - Plans must be objective oriented: Objectives should be quantifiable targets that serve to focus management efforts and measure performance.
  - Resource sustainability should be given top priority and the ecological carrying capacity should never be exceeded.
  - The need for the conservation of biological diversity and wildlife should be recognized.
  - The decision-making process must be visible and equitable.
- Restoration and Afforestation: The process of regenerating the ecosystems of mangrove forests in locations where they once existed is known as mangrove restoration. The practice of mangrove

restoration is based on the field of restoration ecology, which aims to “[assist] the recovery of resilience and adaptive capacity of ecosystems that have been degraded, damaged, or destroyed.”

- **Managed realignment:** Managed realignment typically results in the creation of a salt marsh by removing coastal protection and allowing a previously protected area to flood. Managed realignment is a solution to coastal erosion and rising sea levels.
- **Flow restoration:** Sudden construction of dams affected the wetlands and ended up making mangroves suffer and saltier. Promoting management for the recovery of mangroves will help the ecosystem.
- **Generic protection:** Government policy should be formulated to protect the environment if mangroves.
- **Protected area:** If more mangroves are preserved, approximately 13 million metric tons of carbon dioxide won't be released into the atmosphere.

## 3.5. Sovereignty Rights Of Nations

### 3.5.1. Exclusive economic zone (EEZ):

An area that extends from the coast or, in federal systems, from the seaward boundaries of the constituent states (usually 3 to 12 nautical miles) to 200 nautical miles (370 kilometers) off the coast is known as the Exclusive Economic Zone (EEZ). Nations claim and exercise exclusive fishery management authority over all fish and Continental Shelf fishery resources within this region.

### 3.5.2. Ascension – an EEZ in the South Atlantic?

The MPA will cover the entire Exclusive Economic Zone (EEZ) of Ascension Island, a UK Overseas Territory in the South Atlantic. That means that an area of more than 440,000 square kilometres or 170,000 square miles will be included. Philip Rushbrook, Governor of St. Helena, Ascension, and Tristan da Cunha, designated a large-scale Marine Protected Area (MPA) in the waters around Ascension Island last month, bringing the protection of the “Atlantic Galapagos” one step closer to becoming a reality used in the Ascension Island MPA, making it one of the world's largest.





Figure 1.5- Comfortless Cove on Ascension Island

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