

Coastal Management Examples

There are many different management strategies used by national governments to reduce erosion, stop coastline recession or to increase their beach. However, some strategies are more successful than others and not all strategies are sustainable.

US East Coast Barrier Islands

Characteristics

- The East coast of the USA is dominated by **barrier islands**. These barrier islands can be found from Florida in the South all the way up to Connecticut in the North.
- Made of **sand**, there are 23 shifting barrier islands which each create **lagoons** behind them.
- There is currently ongoing debate about how these islands have formed.

Conservation

- Barrier islands are a form of defence as they **dissipate wave energy** and lead to waves breaking further out and so the waves hitting land are **less destructive**. Since the East Coast is repeatedly hit by **hurricanes** (forming in the Atlantic Ocean), the barrier islands are an important **natural defence** against storm surges.
- Most islands are open for **low-impact tourism activities** – hiking, fishing, bird watching. However, many restrictions are put into place to protect the nesting birds and shellfish.
- **No permanent residence** is permitted on the barrier islands. A previous beach resort and settlements have all been washed away, due to the shifting nature of the barrier islands.

Tuvalu

Tuvalu is a **low-lying** Pacific Island, which is becoming increasingly vulnerable as **eustatic sea level rise** continues. Most areas in Tuvalu are only 1-2m above sea level with the highest point only 4.5m above sea level. Its population have had to **mitigate** to the changing coastal environment or forced to **migrate** to New Zealand.

Problems & Mitigation Solutions

- More **tropical cyclones** are occurring, due to an increase in sea temperatures
 - Residents must construct **cyclone shelters** to avoid injury
- Flooding of low-lying settlements has resulted in the **drowning of cattle**
 - Farmers are forced to move further inland. May consider importing food to avoid hunger.
- **Salt water encroachment** has led to crop failures and loss of local water sources
 - Residents grow staple crops in **concrete plots** and must travel further inland to access a freshwater supply to drink from and water their crops.

Migration

Some cannot afford to mitigate or are fed up of losing cattle, crops and economic assets. Therefore, there is a growing number of **environmental refugees** from Tuvalu who must live in New Zealand to survive. This can result in a **better standard of living**, but **cultural tensions** can arise between the migrants and locals.



The Maldives

97% of inhabited islands in the Maldives are experiencing **erosion** and, as sea levels rise, an increased risk of flooding. For some time, any coastal management by the local government has not been sustainable since:

- **Isolated islands are ignored** as most money is spent on the capital city Male
- Sustainable management of traditional income sources (e.g. fishing) are overlooked in favour of **protecting tourist and urban developments**.

NGO Intervention

- NGOs have encouraged **sustainable living** and **educated locals** to change The Maldives' situation. They have been more successful than the government because they have involved and centred their efforts around the locals, rather than tourists (**public participation**).
- The organisation Mangroves for the Future (MMF) is educating communities about the importance of **coastal mangroves** as a defence against erosion and flooding, hence reducing their deforestation.
- The Global Environment Facility (GEF) has provided **small grants** to locals on the islands in order for them to help develop **sustainable and organic farming**.

Deltawerken Project – Netherlands

This is a **hard engineering** project which began following the **1953 Storm Surge** drastically damaged the Netherlands. **1800 people died** during the storm surge as well as the **flooding** of 10% of the Netherlands' farmland, 40000 building were damaged and a further 10,000 destroyed.

The Scheme

- A series of **dams and gates** constructed along rivers to **control the flow of water** during a storm surge.
- It also aims to reduce the length of the coastline exposed to the sea whilst maintaining **safe access** to the North Sea for shipping.

Sustainability & Longevity

- The cost of the project was **\$5 billion**. However, due to sea level rise, the Dutch will need to spend more than **\$1 billion annually** to maintain and improve defences against the rising sea levels.
- It has allowed for **4 million people** to live below normal sea level, hence easing the Netherlands' population growth.
- The dams have allowed for **new roads and transport connections**, which drastically reduce journey times and reduce isolation for settlements.
- A number of **nature reserves were lost** during construction, though some have been replaced during the project.

