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MATRIC NO: 15/ENG03/034

COURSE: CVE512

1. What strategies can be used to reduce the effects of coastal erosion?

**Groins:** These are long, wall-like structures that are built on beaches and extend into the ocean perpendicular to the shoreline.

**Jetties:** This solution involves constructing a line (2 or more depending on the number of channels) of long structures perpendicular to the coast that reach into the ocean.

**Breakwaters:** These are barriers that are constructed offshore parallel to or at an angle to the shoreline.

**Vegetation:** Strategic planting of vegetation can be used to help control erosion. the roots of coastal plants help to anchor the sand and ensure that it is not carried off in erosion.

**Seawalls:** Seawalls are one particularly effective way to prevent erosion.

1. Describe how coastlines can be protected from coastal erosion.

**Groyne**

A coastal structure constructed perpendicular to the coastline from the shore into the sea to trap longshore sediment transport or control longshore currents. This type of structure is easy to construct from a variety of materials such as wood, rock or bamboo and is normally used on sandy coasts. It has the following disadvantages:

* Induces local scour at the toes of the structures.
* Causes erosion downdrift; requires regular maintenance.
* Typically, more than one structure is required.

**Seawall**

A seawall is a structure constructed parallel to the coastline that shelters the shore from wave action. This structure has many different designs; it can be used to protect a cliff from wave attack and improve slope stability and it can also dissipate wave energy on sandy coasts. The disadvantages of this structure are:

* It creates wave reflections and promotes sediment transport offshore.
* Scour occurs at the toes of eroded beaches.
* It does not promote beach stability.
* It should be constructed along the whole coastline; if not, erosion will occur on the adjacent coastline.

**Offshore breakwater**

An offshore breakwater is a structure that parallels the shore (in the nearshore zone) and serves as a wave absorber. It reduces wave energy in its lee and creates a salient or tombolo behind the structure that influences longshore transport of sediment. More recently, most offshore breakwaters have been of the submerged type; they become multipurpose artificial reefs where fish habitats develop and enhance surf breaking for water sport activities. These structures are appropriate for all coastlines. Their disadvantages are:

* They are large structures and relatively difficult to build.
* They need special design.
* The structure is vulnerable to strong wave action.
1. Suggest why some coastal areas need protecting from the impacts of coastal erosion.

Coastal areas need to be protected from coastal erosion because coastal erosions are wide-ranging; heavy boat traffic, foot traffic, storms, lack of vegetation with anchoring roots, and sea level rise. Many homeowners experiencing loss of property due to erosion unwittingly contribute to it by installing seawalls.