Quadrant II – Transcript and Related Materials

Programme : Bachelor of Arts (Third Year)
Subject : Geography
Semester : V
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Course Title :Fundamentals of Geomorphology
Unit: Geomorphic Landforms and Processes
Module Name: Coastal Landforms
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Glossary of terms/words:

Wearing-eroding

Hurl-throw something with great force

Retreats- moving back

Shingle- small rounded pebbles

Littoral current -a current moving along and roughly parallel to a shore

Possible misconceptions/clarification

Notes: -

<u>Landforms</u>

- Landforms are defined as the natural physical features found on the surface of the earth created as a result of various forces of nature such as wind, water, ice, and movement of tectonic plates.
- Each landform has a specific shape, size and a set of distinguishing characteristics.
- For e.g. Mountains, hills, plateaus, and plains etc.

Coastal landforms

- Coastal landforms are the landforms along the coastline that are mostly formed by erosion and sediments from waves, currents, tides and climatic factors like wind, rainfall, and temperature.

Types of coastal Landform

Coastline landforms can be divided into two groups:

EROSIONAL LANDFORMS

- Headlands
- Bay
- Sea cliff
- Wave- cut platforms
- Sea Arches
- Sea caves
- Sea stack
- Sea stump

DEPOSITIONAL LANDFORMS

- Beach
- Bar
- Barrier
- Tombolo
- Spit
- Hook
- Loop
- Lagoons

Coastal Erosional Landform

- Erosion is wearing away of the land by the sea. This involves destructive waves wearing away the coast.
- There are five main processes which cause coastal erosion –these are
- **Corrasion-** waves pick up beach material(e.g. pebbles) and hurl them at the base of a cliff.
- **Abrasion**- Occurs as breaking waves which contain sand and larger fragments erode the shoreline. It is commonly known as sand paper effect.

- **Hydraulic Action**-This process involves the force of water against the coast. The waves enter cracks(faults) in the coastline and compress the air within the crack. When the wave retreats, the air in the crack expand quickly, causing a minor explosion.
- **Attrition-** is when waves cause rocks and pebbles to bump into each other and break up.
- **Corrosion/ Solution-** This is the chemical action of sea water. The acid in the salt water slowly dissolve rocks on the coast.

Coastal Erosional Landform

The process of erosion can create different landforms along the coastline. Let us see them one by one in detail.

Headlands and Bay

- Headlands are formed when the sea attacks a section of coast with alternating bands of hard and soft rock.
- The bands of soft rock, such as sand and clay, erode more quickly than those of more resistant rock, such as chalk. This leaves a section of land jutting out into the sea called a **headland**.
- The areas where the soft rock has eroded away, next to the headland, are called **bays.**

Sea cliff

- A **cliff** is a mass of rock that rises very high and is almost vertical, like a wall. In coastal areas, strong winds and powerful waves break off soft or grainy rocks from hardier rocks. The harder rocks are left as cliffs.

Wave- cut platforms

- Wave- cut platforms is the narrow flat area often found at the base of a sea cliff or along the shoreline of a lake, bay, or sea that was created by erosion of waves.

Sea caves, Sea Arches, Sea stack

- Sea waves continuously ‘strike’ at the rocks and ‘cracks’ are developed. Over time these cracks become larger and wider. Thus Hollow like caves are formed on rocks. They are called Sea **Caves**.
- **Sea Arches** are formed when a cave continues to be eroded and expanded until it cuts right through a headland.
- A sea stack forms when a sea arch continues to be eroded and widened until the rock becomes too weak to support the roof of the sea arch and collapse into the sea. The remaining pillar of rock is known as **sea stack**.

Sea stump

- A sea stump is formed when a tall sea stack is eroded and worn down until it juts just above the surface of the sea.

Coastal Depositional Landform

- Coastal deposition is when the sea drops or deposits material. This can include sand, sediment, and shingle, resulting in landforms of coastal deposition.
- Depositional landforms developed by the sea waves include the beach, bar, lagoon, spit, tombolo, barrier island, etc. Let us see one by one in detail.

BEACHES

Beaches are usually made up of material deposited on a wave-cut platform. Beaches are usually consists of loose particles, which are composed of sand, gravel and shingle or pebbles.

Bars and Barriers

- The ridges, embankments or mounds of sands formed by sedimentation through sea waves parallel to the shoreline are called **Bars** .
- The larger forms of bars are called **barriers.**

Spits, Hooks and Loop

- **Spit** is a landform made by the deposition of sand by the movement of tides. They are narrow and elongated – one end is attached to the mainland and the other is out in open water.
- High-energy storm waves very often modify the shape of spits by bending them towards the coast . So the curved spits assume the shape of hook and thus such spits are called hooks.
- When the opposing currents become more dominant than the littoral currents, the spits are bent to such an extent that they are attached to the mainland (coast) and thus form complete loop which encloses sea water in the form of lagoons. Such form of a spit is called **loop**

Tombolo

- A bar connecting the mainland with an island or connects a headland with the island is called a Tombolo. It acts as a bridge between the coast and an island.

Lagoons

- **Lagoon** is a shallow body of water separated from a larger body of water by a narrow landform, such as reefs, barrier islands, barrier peninsulas, or isthmuses.