

Class 11 Geography Notes Chapter 6 Land forms and their Evolution

After weathering processes have had their actions on the earth materials making up the surface of the earth, the geomorphic agents like running water, ground water, wind, glaciers, waves perform erosion.

Due to changes in climatic conditions and vertical or horizontal movements of landmasses, either the intensity of processes or the processes themselves might change leading to new modifications in the land forms.

A landmass passes through stages of development somewhat comparable to the stages of life — youth, mature and old age. .

Changes on the surface of the earth owe mostly to erosion by various geomorphic agents. Of course, the process of deposition too, by covering the land surfaces and filling the basins, valleys or depressions brings changes in the surface of the land.

The geomorphic agents acting over long periods of time produce systematic changes leading to sequential development of land forms. Each geomorphic agent produces its own assemblage of land forms.

Many varieties of land forms develop by the action of each of the geomorphic agents depending upon especially the type and structure i.e. folds, faults, joints, fractures, hardness and softness, permeability and impermeability, etc.

In humid regions, which receive heavy rainfall running water is considered the most important of the geomorphic agents in bringing about the degradation of the land surface.

The gentler the river channels in gradient or slope, the greater is the deposition.

Streams are few during youth stage with poor integration and flow over original slopes showing shallow V-shaped valleys with no floodplains or with very narrow floodplains along trunk streams. Stream divides are broad and flat with marshes, swamps and lakes.

During mature stage, streams are plenty with good integration. The flat and broad inter stream areas and swamps and marshes of youth disappear and the stream divides turn sharp. Waterfalls and rapids disappear.

Smaller tributaries during old age meander freely over vast floodplains showing natural levees, oxbow lakes, etc.

Any limestone or dolomitic region showing typical land forms produced by the action of groundwater through the processes of solution and deposition is called Karst topography after the typical topography developed in limestone rocks of Karst region in the Balkans adjacent to Adriatic sea.

Drumlins are smooth oval shaped ridge-like features composed mainly of glacial till with some masses of gravel and sand. The long axes of drumlins are parallel to the direction of ice movement. They may measure up to 1 km in length and 30 m or so in height.

A glacier in its valley is slow unlike water flow. The movement could be a few centimeters to a few meters a day or even less or more. Glaciers move basically because of the force of gravity.

We have many glaciers in our country moving down the slopes and valleys in Himalayas. Higher reaches of Uttarakhand, Himachal Pradesh and Jammu and Kashmir, are places to see some of them.

The highest peak in the Alps, Matterhorn and the highest peak in the Himalayas, Everest are in fact horns formed through headward erosion of radiating cirques.

Erosional forms dominate in the west coast. The east coast of India is a low sedimentary coast. Depositional forms dominate in the east coast.

Class 11 Geography Notes Chapter 6 Important Terms:

- **Landforms:** In simple words, small to medium tracts or parcels of the earth's surface are called land forms.
- **Landscape:** Several related landforms together make up landscapes.
- **Geomorphology:** Geomorphology deals with the reconstruction of the history of the surface of the earth through a study of its forms, the materials of which is made up of and the processes that shape it.
- **Outwash Deposits:** Some amount of rock debris small enough to be carried by such melt-water streams is washed down and deposited. Such glacio- fluvial deposits are called outwash deposits.
- **Gorge:** A gorge is a deep valley with very steep to straight sides.
- **Canyon:** A canyon is characterised by steep step-like side slopes and may be as deep as a gorge.
- **Delta Plains:** The flood plains in a delta are called delta plains.
- **Potholes:** Over the rocky beds of hill-streams more or less circular depressions are formed because of stream erosion aided by the abrasion of rock fragments. They are called potholes.
- **Plunge Pools:** A series of such depressions eventually join and the stream valley gets deepened. At the foot of waterfalls also, large potholes, quite deep and wide, form because of the sheer impact of water and rotation of boulders. Such large and deep holes at the base of waterfalls are called plunge pools.
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- **Incised Or Entrenched Meanders :** Very deep and wide meanders can also be found cut in hard rocks. Such meanders are called incised or entrenched meanders

- **Karst Topography:** Any limestone or dolomitic region showing typical land forms produced by the action of groundwater through the processes of solution and deposition is called Karst topography.
- **Paired Terraces:** The river terraces may occur at the same elevation on either side of the rivers, these are called paired terraces.
- **Unpaired Terraces:** When a terrace is present only on one side of the stream and with none on the other side or one at quite a different elevation on the other side, the terraces are called unpaired terraces.
- **Glacial Till:** The unsorted coarse and fine debris dropped by the melting glaciers is called glacial till.
- **Ground Moraines:** Many valley glaciers retreating rapidly leave an irregular sheet of till over their valley floors. Such deposits varying greatly in thickness and in surface topography are called ground moraines.
- **Medial Moraine:** The moraine in the centre of the glacial valley flanked by lateral moraines is called medial moraine.
- **Barrier bars:** Bars are submerged features and when bars show up above water, they are called barrier bars.
- **Spit:** Barrier bar which get keyed up to the headland of a bay is called a spit.
- **Sea Stacks:** Retreat of the cliff may leave some remnants of rock standing isolated as small islands just off the shore. Such resistant masses of rock, originally parts of a cliff or hill are called sea stacks.
- **Wave-Cut Terrace:** At the foot of such cliffs there may be a flat or gently sloping platform covered by rock debris derived from the sea cliff behind. Such platforms occurring at elevations above the average height of waves is called a wave-cut terrace.
- **Off-Shore Bar:** A ridge of sand and shingle formed in the sea in the off-shore zone (from the position of low tide waterline to seaward) lying approximately parallel to the coast is called an off-shore bar.
- **Parallel Retreat of Slopes Through Backwasting :** Once, pediments are formed with a steep wash slope followed by cliff or free face above it, the steep wash slope and free face retreat backwards. This method of erosion is termed as parallel retreat of slopes through backwasting.
- **Pediments:** Gently inclined rocky floors close to the mountains at their foot with or without a thin cover of debris, are called pediments.
- **Pediains:** Through parallel retreat of slopes, the pediments extend backwards at the expense of mountain front, and gradually, the mountain gets reduced leaving an inselberg which is a remnant of the mountain. These low featureless plains are called pediains.
- **Playas plains:** These are by far the most prominent land forms in the deserts. In basins with mountains and hills around and along, the drainage is towards the centre of the basin and due to gradual deposition of sediment from basin margins, a nearly level plain forms at the centre of the basin. In times of sufficient water, this plain is covered up by a shallow water body. Such types of shallow lakes are called playas where water is retained only for short duration due to evaporation and quite often the playas contain good deposition of salts.

- Alkali Flats: The playa plain covered up by salts is called alkali flats.
- Deflation hollows: Deflation hollows and caves weathered mantle from over the rocks or bare soil, gets blown out by persistent movement of wind currents in one direction. This process may create shallow depressions called deflation hollows.
- Caves: Deflation also creates numerous small pits or cavities over rock surfaces. The rock faces suffer impact and abrasion of wind-borne sand and first shallow depressions called blow outs are created, and some of the blow outs become deeper and wider fit to be called caves.
- Tunnels: Caves having openings at both the ends are called tunnels.
- Glaciers: Masses of ice moving as sheets over the land or as linear flows down the slopes of mountains in broad trough-like valleys (mountain and valley glaciers) are called glaciers.
- Fjords: Very deep glacial troughs filled with sea water and making up shorelines (in high latitudes) are called fjords.
- Tam Lakes: A lake of water can be seen quite often within the cirques after the glacier disappears. Such lakes are called cirque or tarn lakes.