

GEOMORPHIC PROCESSES AND AGENTS

The geomorphic processes are all those physical and chemical changes which effect a modification of earth's surficial form. A **geomorphic agent or agency** is any natural medium which is capable of securing and transporting earth material. Thus running water, ground water, glaciers, wind, waves and currents are the great geomorphic agents. They may be called as mobile agents because they remove materials from one part of the earth's crust and transport and deposit them elsewhere. The processes performed by these agents originate outside the earth's crust. Such processes have been termed as exogenetic. Other geomorphic processes originate within the earth's crust and are thus designated as endogenetic. Volcanism and diastrophism belong to this class. An outline of the geomorphic processes is given below:

1. EXOGENETIC PROCESSES

GRADATION.

DEGRADATION

Weathering.

Mass wasting or gravitative transfer

Erosion by:

Running water

Groundwater

Waves, currents, tides, and tsunami.

Wind.

Glaciers.

AGGRADATION BY:

Running water

Groundwater

Waves, currents, tides, and tsunami.

Wind.

Glaciers.

WORK OF ORGANISM, INCLUDING MAN.

2. ENDOGENETIC PROCESSES.

DIASTROPHISM AND VULCANISM.

3. EXTRATERRESTRIAL PROCESSES.

INFALL OF METEORITES.

All those processes those tend to bring the surface of the lithosphere to a common level are called **gradational processes**. Gradational processes belong to two categories, **degradation** - those which level down and **aggradation** - those which level up.

The three distinct degradational processes are weathering, mass-wasting, and erosion. **Weathering** may be defined as the disintegration and decomposition of rocks in place. It is a static process and does not involve the removal of material by a transporting agency. **Mass-wasting** involves the bulk transfer of mass of rock debris down slope under the direct influence of gravity. Mass-wasting is usually aided by the presence of water. **Erosion** is a comprehensive term applied to the various ways by which the mobile agencies obtain and remove rock debris. The weathering and erosion are entirely distinct processes.

Aggradation is an inevitable concomitant of degradation and contributes to the general leveling of the earth's surface. More attention has been given to erosional than to depositional land forms because the erosional land forms are more striking and depositional land forms have little relief to be shown well on topographical maps.

Organism also play an important role in shaping the earth's surface. Man-made quarries, road cuts and fills, and many other types of excavations profoundly modify the earth's surface. Reefs build by corals are striking features of tropical seas. Ants, termites, prairie dogs, gophers, birds, and other animals build mounds which locally may be conspicuous. Even vegetation may play a role in the development of land surface.

Diastrophism can be defined as the movement of major parts of the earth's crust resulting in regional deformation. Diastrophic processes are usually classified as two types 1) **Orogenic** - *mountain building with deformation*. 2) **Epeirogenic** - *regional uplift without important deformation*. Volcanism includes the movement of molten rock or magma onto or towards the earth's surface. The topographic effects of extrusion of lava are direct and immediate.

Most unusual land forms are produced by the **impact of meteorites**. Such forms are rather rare but approximately fifty well substantiated meteorite craters are known to exist.

(References: *Principles of Geomorphology* by William D. Thornbury, 2002, CBS Publishers & Distributors New Delhi)