

# Topic: Nature and Scope of Geomorphology

## Definition and nature of geomorphology:

The word “**geomorphology**” was first coined and used between the 1870s and 1880s to describe the morphology of the surface of the Earth. But it was popularized by the American geologists **William Morris Davis** who proposed the “**geographical cycle**” also known as “Davis cycle”

Geomorphology is an important branch of Physical Geography (geomorphology, climatology, biogeography, oceanography). It is concerned with the scientific study of the origin and evolution of the relief features of the earth.

The term geomorphology has been derived from Greek words and combination of three words i.e ‘**ge**’ (earth), ‘**morphe**’ (form) and ‘**logo**’ (a discourse). Thus geomorphology is the description (discourse) of various forms (morphe) of the earth’s surface. Geomorphology is the systematic and organised description and analysis of various landforms of the earth.

The word ‘**landforms**’ includes not merely micro features of the land and but also major relief features such as continents, plain and plateaus and a discussion of their origin and evolution is equally relevant.

Geomorphology is the scientific study of the origin and evolution of topographic and bathymetric created by physical , chemical and biological processes operating at or near the earth’s surface.

**P.G Worcester** defined geomorphology as ‘the interpretative description of the relief features of the earth’.

According to **Strahler**, geomorphology is an analysis of the origin and evolution of earth features. Geomorphology does not merely study the physical, chemical and biological processes affecting the evolution of landforms but also the structure of the earth’s crust, the geological processes as well as the climatic influences, because it is the combined influence of all these factors that determines the landforms.

According to **W.D. Thornbury**, geomorphology is the science of landforms including the submarine topography.

**A.L. Bloom** also defined geomorphology as the systematic description and analysis of landscapes and the processes that change them.

According to German geologists **Machatschek**, Geomorphology is the study of the physical processes fashioning the form of the solid surface of the earth as well as the resultant landforms.

Nature of geomorphology can be divided into three categories:

1) **Scientific nature:** geomorphology is the scientific study of landforms .It gives scientific account of the physical face of the earth. Spatial relations through geological time scale are analysis in this subject.

2) **Interdisciplinary nature:** geomorphology is interdisciplinary by nature. It has close relationship with other branches of natural science (geology, hydrology, biology, chemistry, geophysics, meteorology, pedology, engineering etc)

3) **Dynamic nature:** Face of the earth is constantly changing because of it is dynamic nature. These changes are caused by both external and internal forces.

### scope of geomorphology :

The Subject matter of Geomorphology incorporates **Structure, Process, systematic analysis and evolution of Landforms.**

**Structure** is an arrangement of interrelated elements in a material object or system. It is determined by internal a force which includes plate tectonic, diastrophism and volcanic action. It includes **study of geomaterials** (lithology, deposition of rock beds and composition of rocks etc)

**Processes** are mainly related to **external or exogenic forces**. These forces contribute to shape a landscape. They are also called destructional processes or denudational processes. *(for detail read geomorphic processes)*

**Systematic analysis and evolution of landforms(time factor),**is also an important in geomorphic evolution like structure and processes because the interaction because the interaction structures does not provide adequate explanation because the interaction of surface processes with geological structures does not provide adequate explanation of landforms unless we include the explanation of the length of time the process has been operating which will give us an idea of the relative stage of development.

For systematic analysis of landforms, we can classify landforms into three categories. They are

- 1.Generic classification of landforms
- 2.Genetic classification of landforms
- 3.Classifcation on the basis of scale and lifespan

**Generic classification of landforms** is the description of entire group or class of landforms i.e., Mountain Plateau and Plains (example, Himalayan Mountain ranges, Tibetan Plateau and the Northern plains in India).

**Genetic Classification of Landforms:** It means classification of landforms by dominant set of geomorphic processes. For example, Tectonic landforms, fluvial landforms, Karst landforms, Aeolian landforms, Coastal landforms and Glacial landforms.

**Classification of landforms on the basis of scale** can be understood by rearranging the earth's landforms into three different orders: for example,

1) **First order relief features:** it includes Continental Platforms and Ocean Basins. .

2) **Second order relief features:** The relief features of the second order are superimposed on First order category of landforms for example, plains, plateau and mountains.

3 ) lastly, **Third order relief features** are superimposed on II order relief features such as Valleys, Canyons and Dunes.

Two major approaches in geomorphology are:

1) **Historical approaches:** it involves historical evolution of landforms

2) **Functional approaches:** it involves time –independent series of landforms evolution reflecting association between landform characteristics and existing environmental condition.

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