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A Study about Approaches to Geomorphology, Its Nature and Scope: A Review

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Abstract
Geomorphology is the study of Earth's surface features and their origins. In general, the study of landforms and landscapes is referred to as geomorphology. Humans have had theories about Earth's origins and landscapes for as long as they have been walking the planet and tilling the soil. Landforms are the most common geomorphic phenomenon, and there has been a long history of inquiry about their genesis.
Key words: Geomorphology, landscapes, philosophers etc.

Introduction

There are many, however, who define geomorphology in such a wide sense as to encompass not only land surface activities, but also a planet's overall structure and dynamic processes as well. There are two definitions of geomorphology, according to Thornbury in 1969 and Chorley et al. in 1984: the scientific study of the geometric aspects of Earth's surface and underwater formations. Both claim that geomorphology comprises all components of the contact between the solid earth, hydrosphere, and atmosphere despite its widespread use being confined to formations above sea level. This includes not just the continents' landforms and their geological formation, but the ocean's subsurface morphology as well. A different school of thought has confined geomorphology to the study of sub-aerial landforms formed by erosion or depositional processes.

Nature and scope of geomorphology

There are three major aspects of the study of geomorphology

- Firstly, it is the study of the relations between landforms and the underlying rocks i.e. Geological Geomorphology. Thus, geomorphology is concerned with the interactions between denudation processes and the rock strength. Hence, in the precise investigation of the resistance of rocks to denudation, detailed experimental work on rocks must be carried out.
- In its second sense, geomorphology is the study of the evolution of landscapes. Such studies have been termed denudation chronology. Such studies attempts to reconstruct succession of pictures of the relief at different times. Alterations of relief are usually believed to have been caused by changes of base level and climate.
- The third aspect of geomorphology is the study of the actual process of erosion which gives rise to landforms. Unlike the first two aspects of Geomorphology, which are essentially regional in approach, this third aspect is systematic. It aims to understand the action of waste movement of water movement, ice, and wind as well as the processes of weathering.

Approaches to geomorphologic studies

Geomorphologic studies comprise a spectrum of approaches between two major interrelated conceptual bases, namely: historical studies and functional studies. To these two may be added a third, the Climatic geomorphology approach.

- **The Historical Approach-**

1. The erosion and depositional aspects of the landscape may be used by historians to learn about the history of a place. For example, the tectonic, sea level, and climatic conditions that it has experienced. Landform assemblages, according to this research, have evolved as a result of their environment's many cycles of upheaval. Landforms with slowly evolving characteristics and those that give evidence to the superimposed impacts of climatic and tectonic changes are most suited for historical interpretation. Retro diction is used to derive the chronology of previous events that shaped the environment. The cyclic method and the chronology of denudation are two related historical approaches.
2. **Cyclic Approach :**
   The cyclic approach was initiated and established by W.M Davis (1850- !9340), who summarized the basic thesis of his work in the phrase Landforms are a function of structure process and stage. Although he concentrated on the sequence of events in explaining the evolution of landforms, this evolutionary sequence he termed the cycle based on his conceptualization that landforms like the human life pass through the stages of youth, maturity and old age. A major feature of any cycle is that the end position should be similar to the initial one. Thus, the end product of Davisian cycle of erosion, the pen plain is about the same as the initial land surface.

3. **The Denudation Chronology Approach**

The mainstream of geomorphologic thought particularly in Britain from about 1930-1950 was denudation chronology. This was the deliberated attempt to make use of erosion surfaces at different attitudes to reconstruct the geomorphologic history of a region. An erosion surface is an extensive flat area known to have been produced by erosion and representing the product of a cycle denudation chronology is thus, not concerned about the origin of just one landform, but an assemblage of landforms or surface. The main roles of denudation chronology are the identification, dating and interpretation of Plantation surfaces. In addition, it has the subsidiary aim of studying the way in which the drainage system of an area has evolved. However, denudation chronology involves the absolute or relative dating of erosional and depositional events occurring under the influence of tectonic, ecstatic, climatic, or other variations. The techniques used to identify erosion surfaces comprising a combination of field observation and analysis of contoured map.

- **Climatic geomorphology approach**

Geomorphology in Europe outside of Britain and France has evolved more or less without reference to Davis erosion cycle or chronology of denudation. Essentially, their criticism of these historical views was that various climates create distinct processes,

and those processes, in turn, produced diverse landforms. Instead of relying on these historical methods, scientists turned to a new theoretical technique known as Climatic Geomorphology. According to this theory, various climates have different assemblages of processes, and these assemblages in turn produce varied assemblages of landforms. Every occurrence or process whose global extent is more or less related to latitude is referred to as zonal according to this method. This approach. Each of these zones, known as "morph climates," has its own specific climate processes and landforms. The climatic approach has resulted in these zones being identified. So, one of the aims of climatic geomorphologists is to identify places where climate may dictate the major geomorphic processes and thus greatly impact landform creation. But Von Richthjofen, who was developing his theories of climatic geomorphology towards the end of the 19th century, has been linked to the development of climatic geomorphology. Climatic geomorphology has gained prominence in Europe and North America since the 1950s; it is still being used to explain the formation of regional landform assemblages worldwide, as demonstrated by this study.

- **Modern functional approaches**

To describe landforms in terms of their function, modern functional methods often focus on how landforms are generated, sustained, or modified in relation to their environmental context. Geomorphologists can get a better understanding of how landforms are maintained and how they evolve by observing, measuring, and analysing current processes and the behaviour of earth components. There is a strong focus on prediction and the deduction of consequences created by causal elements in most functional theories of landforms. Consequently, modern functional methods focus on process and form. An understanding of erosion and deposition, as well as their mechanisms and rates of operation is gained in order to explain the landforms' historical history and foretell future changes in the landscapes. The modern-functional approach to geomorphology comprises of two related methods, namely:

1. Direct field observation and measurement and

2.Simulation modelling. Both involve the observation, measurement and mathematical/statistics analyses of both process and form in order to objectively explain landform evolution.

Aims and objectives of geomorphology

There have always been controversy and confusion about the nature of Geomorphology, these reflects the fact that historically, Geomorphologists have at one time or another attempted to answer three basic sorts of questions about the Earths landforms and landscapes (Higgins 1989), the questions are:

1. How can these features and processes be described?
2. How can they form and changed through time?
3. What processes are responsible for them and how do these processes work?

The first three lines of inquiry would seem to be a function of physical demography, one goal of which is commonly understood to be an accurate comprehensive and comprehensible description of the earth’s surface. The term physiographic has come to be

used for such descriptive studies through the mistaken impression that the word was originally coined as a contraction of physical geography however, originally used this term in its literal sense for the study of natural phenomena in general. Later, Powell (1895) restricted it to the surface features of the earth with an emphasis on their mode of origin; and as such the term is approximately synonymous with geomorphology which has largely superseded it while W.M Davis used the term Geomorphography for the descriptive study of landscapes. To most Geomorphologists, the ultimate aim of landform study is to explain how individual landforms and landform assemblages have originated and developed. Geomorphology was concerned primarily with the second line of inquiry i.e. the study of landform origin and change which Davis and other early authors sometimes called Geomorphology. In fact, argued that the: essential and critical distinction between Geomorphology and Dynamic geology is: the recognition of landforms or the ruminants of landforms produced by processes no longer in action, thus, in its essence and in its methodology, Geomorphology is historical. This is the true function of the study of landforms within the generous and inclusive arms of the mother science of Geology.

According to Small (1978), landforms and landscapes are so complex and pose such a variety of problems that several genetic approaches exist. The third line of inquiry into the nature and the result of the processes that shape the earth's surface is sometimes called process Geomorphology, although the principles and methods of study are borrowed directly from the soil science and rock mechanics: hydrology and geophysics, Kirk Bryan however term such studies Dynamic Geology and emphatically excluded them from his Geomorphology. Process Geomorphology is concerned with the investigation of the relationship process and form. This involves in the first instance a careful analysis of weathering, transport of sediments, erosion and deposition processes both as regards their mechanism and as regards rate of operation.

And secondly, relating casually, individual processes and groups of processes to particular forms. A typical example is the attempt by fluvial geomorphologists to casually relate such fluvial processes as stream discharge, bed and bank erosion, sediment transport and sediment deposition to river channel form and pattern. Despite Bryans restriction, geomorphology is nowadays generally understood to cover all the three lines of inquiry or aspects of landform study: description, genesis and history, and process. In parts, this reflects the interdependence of all three sorts of investigations. For example, a sound reconstruction of the history of a particular landform requires both a clear picture of what that landform is today and clear understanding of the operation and results of the various processes that may have shaped it. On the other hand, a sound description of a modern landform should take into account not only its present form and structure but its antecedents as well. Finally, geomorphic studies of earth forming processes necessarily include the effects such processes have on earth materials and landforms. Such study in turn provides information needed to describe and interpret the histories of existing landscapes that may have been affected by these processes. Thus, each line of geomorphic inquiry serves the other and in turn depends on the others for fresh input observations and ideas.

Conclusion

The three Greek terms gew, logo, and morph combine to form the term "geomorphology. So, we may say that 'a discourse on Earth forms' is what geomorphology entails. Analysis of Earth's physical land surface characteristics, including rivers, hills and plains, as well as beaches, dunes, and other water- and land-based features. Some geomorphologists include underwater landforms in their area of work. The surface features of other solar system bodies such as Mars, Venus, the Moon, and other terrestrial planets and satellites are also frequently included in these lists. Despite the fact that the Earth's landforms change with time, they're still there to see. From molehills to mountains to major tectonic plates, their sizes and "lives" range from days to millennia to aeons. In the 1870s and 1880s, geomorphology was the principal term used to describe the shape of the planet's surface.

References

[1] Chorly, R.J: Spatial Analysis in Geomorphology.
[2] King, L.C: The Morphology of the Earth.
[3] Singh, Savindra – Bhooakrity Vigyan
[4] Sparks, B.W: Geomorphology
[5] Tharnbury, W.D.: Principles of Geomorphology.
[6] Warcester: A Text Book of Geomorphology
[7] Tharnbury, W.D. : Principles of Geomorphology.
[8] Warcester : A Text Book of Geomorphology
[9] Chorly, R.J. : Spatial Analysis in Geomorphology.
[10] Sparks, B.W. : Geomorphology