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NATURE AND SUBJECT MATTER OF GEOGRAPHY

Geography is one of the oldest earth sciences and its roots date back in the works of the early Greek scholars. The word 'geography' was first used by the Greek scholar Eratosthenes in the third century B.C. Geography is made of two words 'Geo' and 'Graphy'. Geo means "Earth" and Graphy means "to describe". Thus, the literal meaning of geography is to describe the earth's surfaces. In other words "Geography is the study of the interaction of all physical and human phenomena and landscapes created by such interactions." It is about how, why, and where human and natural activities occur and how these activities are interconnected. In simple words, the object of geography is to know the earth in its total character including physical, biological and human phenomena interacting with each other. Geography has undergone changes in its approach. The earlier geographers were descriptive geographers. Later, geography came to be developed as an analytical science. Integration of heterogeneous phenomena needs analysis as well as synthesis of multiple factors. Today the discipline is not only concerned with descriptions but also with analysis, synthesis as well as prediction.

In this lesson you will learn how important geography is in everyday life. This study will encourage you to understand your surrounding environment with greater interest. You will also study various approaches, methods and branches to Geography.

OUTCOMES

After studying this lesson, learner:

- describes the use of Geography in daily life;
- traces development of Geography as a discipline;
- explains human-environment relationships and their impacts on each other;
- illustrates the systematic and regional approaches of Geography;

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- explains various analytical techniques in Geography; and
- identifies the different branches of Geography and its scope.

1.1 GEOGRAPHY IN DAILY LIFE

One pertinent question is why should there be such a field as geography? The answer is that this is the only living planet, universe or world in which we live and can directly experience. You must have noticed that the earth's surface is ever changing. In general, the natural features like mountains, rivers, lakes etc. change slowly while the cultural elements like buildings, roads, crops, change fast. Traveling-from one place to another you notice that the number and types of trees change from area to area. All this is because of the changes in factors governing the growth of trees such as climate, soil and terrain and the continuous interaction between the environment in which we live in and the way we use it. The study of Geography is about observing such patterns.

Another aspect of geography is to understand the factors or reason behind the areal differentiation, how social, cultural, economic and demographic factors change our physical landscape and create new or altered landscapes by human interventions. For example, human settlements are the transformation-of forest or barren lands for living purposes by human beings. The features of the earth have a different significance for peoples of different cultures, of different times and of different groups and individuals within the same time and culture.

Geography is often thought of as the art of making and studying maps. Maps give us a much more correct and graphic view of the way the Earth's surface looks compared to a picture of drawing. As earlier, even today geographical information about an area is available through reports, travel diaries and gazetteers. At present maps can be drawn by using satellite images using Geographic Information Systems (GIS) tools. Computers easily convert the information from satellite images into maps to show what changes development can bring about. Such information is of benefit to society. Such mapmakers are in great demand today. Nowadays geographers, engineers, environmental scientists, city planners, social scientists, and many others learn to use GIS to understand the Earth better.

Geography not only investigates what is on the Earth, but also why it is there. Geographers study the location of the activities, carefully identify patterns using maps and find out the reasons for these patterns. The areas are then described based on the distribution of landforms , population, house type and agriculture. They discover the linkages and movements between places and are able to infer the spatial processes that are working in an area.

Today, all over the world there are problems related to providing food security, health, effective energy use and environmental conservation. Equally important are equality issues and sustainable development. All these can be achieved by using our resources in sustainable ways. Study of

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geography is, therefore, necessary to learn more about environmental processes and to understand how land use planning can help us to overcome problems.

Geographical thinking and concepts affect our daily decisions in a number of ways– For example when urban master plans are made or rural development strategies are considered, it is important to understand the physical structure, climatic conditions and availability of resources in an area. The decision to shift industries from city areas would require the extension of industrial land use into farming areas. This would displace farmers and their source of income. Similarly, the construction of a railway line or highway causes ribbon development. Many economic activities concentrate along such corridors. Thus, knowledge of geography plays a crucial role in identification of suitable sites for different types of projects with minimum collateral damage to the surrounding environment as well as to the local community. Nowadays, the need to provide relief material to all affected persons after a flood or an earthquake requires a good understanding of the geography of the area. Distribution of relief is functional and related to the needs of people, according to climate or terrain.

Basic Concepts

Geography has been defined differently through different periods of its history. Geographical work in ancient Greece had followed two distinct traditions. One was the mathematical tradition which was focused on fixing the location of places on the earth's surface, and the other was gathering geographic information through travels and field work. According to them, the purpose of geography was to provide a description of the physical features and conditions in different parts of the world. The emergence of regional approach in geography also emphasized the descriptive character of geography. According to Humboldt, geography is the science related to nature and it studies and describes all material things found on earth. The word KOSMOS was used by Humboldt to describe the nature of outer space and earth. He imparted a unifying perspective to the studies of science, nature and mankind. Another important school of thought defined geography as the study of man-environment relationships. The concept of "Erdkunde" by Carl Ritter, "Chorology" by Hettner and "Areal differentiation" by Hartshorne emphasized the regional approach to study geography. It was only after Carl Saur - Hartshorne debate that the use of quantitative methods in geography increasingly accepted and popularized due to which spatial analysis became possible. Subsequently, welfare approach, radical approach, humanistic approach, modernism and postmodernism approaches enriched the studies in geography.

INTEXT QUESTIONS 1.1

1. What is geography?

2. Why is the earth's surface changing?

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3. Who has coined the term 'Geography"?

4. Which are the two distinct traditions followed by Greeks?

1.2 DEVELOPMENT OF GEOGRAPHY

Ancient Period

The earliest records illustrate the interests of scholars in understanding the physical domain of the earth by making maps and astronomical measurements. The Greeks are given the credit of being the earliest geographers, prominent among them being Herodotus, Thales, Aristotle and Eratosthenes.

Pre-Modern Period

This period starting from the middle of 15th century and continuing with the 18th century provides us with enormous information about the physical and cultural nature of the world by the travels and explorations of early geographers. The early seventeenth century witnessed the beginnings of a new scientific geography. Christopher Columbus and Vasco de Gama, Ferdinand Magellan and Thomas cook were important explorers and travelers among those. Varenius, Kant, Humboldt and Ritter led the geographers of this period. They contributed in the development of cartography and discovering new lands, and developing geography into a scientific discipline.

Modern Period

Ritter and Humboldt are frequently referred to as the founders of modern geography. Generally, the latter half of the nineteenth century is considered a period of modern geography. The first modern geographer in the true sense was Ratzel who built the structure of modern geography on the foundations laid down by classical geographers.

Recent Period

The development of geography during the post Second World War period has been very rapid. The American and European geographers such as Hartshorne have contributed the most during this phase**.** Harthshorne described geography as a science dealing with areal differentiation. The present day geographers look upon regional approach and systematic approach as complementary rather than contradictory.

Scope of Geography

Geography has now acquired the status of science that explains the arrangements of various natural and cultural features on the earth surface. Geography is a holistic and interdisciplinary field of study engaged in understanding the changing spatial structure from past to the future. Thus, the scope of geography is in various disciplines, like armed services, environment

management, water resources, disaster management, meteorology and planning and various social sciences. Apart from that, a geographer can help in day to day life like tourism, commuting, housing and health related activities.

1.3 APPROACHES FOR STUDY OF GEOGRAPHY

Today, geography is the only discipline that brings all natural and human sciences on a common platform to understand the dynamics of the spatial configuration of the earth surface. There are two main approaches in geography:

A. Systematic

B. Regional

Systematic Approach

A study of specific natural or human phenomenon at world scale that gives rise to certain spatial patterns and structures on the earth surface is called systematic study. This approach was given by Humboldt, a German geographer (1769-1859). Ordinarily, systematic geography is divided into three main branches. Additionally, philosophy of the subject and use of quantitative techniques helps in understanding the subject and analysis and synthesis of the phenomena respectively.

Main branches of systematic geography;

- Physical geography
- Human geography
- Biogeography, including environmental geography
- Methods and Techniques in Geography

a. Physical geography

It deals with earth systems like atmosphere (air), the hydrosphere (water), the lithosphere (earth solid rock) and biosphere, which encompasses all of earth's living organisms. Astronomy, geomorphology, climatology, oceanography, hydrology, water resources and soil geography are the sub-branches of physical geography. Let us discuss some of the branches in brief.

b. Human geography

It describes population and dynamics of social, economic, and political aspects of space. The Sub branches includes; Population geography, Settlement geography, Economic geography, Resource geography, Agriculture geography, Industrial geography, Social and cultural geography, Geography of health, Political geography, Transport geography and Historical geography.

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c. Biogeography and environment geography

It focuses on evolution and distribution of plants (flora) including grasslands and forest and animals (fauna), ecosystems and environment. Focus is on processes, types, distribution, human- nature relationships and the quality of the living environment including the elements of water, air and noise pollution, solid waste and waste water management.

d. Geographical methods and techniques

It deals with methods and techniques for field studies, qualitative, quantitative and cartographic analysis and use of Geographic Information System (GIS), Global Positioning system (GPS) and remote sensing for mapping, modeling and spatial analysis.

Regional Approach

Vidal de la Blache, Carl Ritter, Alfred Hettner and Richard Hartshorne were the prominent geographers who advocated a regional approach in geography. Unlike systematic approach, regional approach starts with the spatial imprints of one or all the systematic geographic processes discernible as regions of different sizes. Regions could be based on a single factor like relief, rainfall, vegetation, per capita income etc. They could also be multifactor regions formed by the association of two or more factors. Administrative units like states , districts, tehsils also can be treated as regions. The main sub branches of regional geography are:

- Regional studies
- Regional planning
- Regional development
- Regional analysis

Regional studies: It refer to the study of a region. It comprises Macro or large scale like the whole world or a country, Meso or medium scale like a region such as Chota Nagpur Plateau and Micro or small scale like a village, tehsil or a district.

Regional planning: It is planning of a region at different scales, country/ rural or urban.

Regional development: It is the execution of regional plan i.e development of a region at different scale/size.

Regional analysis: It refers to description, analysis and synthesis with a regional approach to understand the spatial disparities in development.

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INTEXT QUESTIONS 1.2

1. Which are the main branches of systematic geography?

2. Name the main branches of regional geography.

1.4 METHODS AND TECHNIQUES OF GEOGRAPHY

Each branch of systematized knowledge has certain methods / tools and techniques on which it depends to further its basic objectives. Geography too has its tools, techniques and methods. Important among them are globes, maps, diagrams, relief models and spatial analytical methods. Cartography is concerned with preparation of maps and diagrams to show distribution of geographical phenomena. Important methods in geography are deductive and inductive in nature. Various statistical techniques and models are used for regional analysis and to understand spatial distribution and interaction.

a. Cartography

Most of us are fascinated with maps. "Cartography" is the study and practice of making maps and diagrams. It represents the earth with maps and abstract symbols. Maps have traditionally been made using pen, ink and paper, but computers have revolutionized cartography and with GIS methods one can prepare maps and diagrams with greater choice and efficiency.

Spatial data is obtained from measurement and other published sources and can be stored in a database, from which it can be extracted for a variety of purposes. Current trends in this field are moving away from drawing with ink or paper type methods of map making towards the creation of increasingly dynamic, interactive maps that can be manipulated digitally. Most commercial quality maps are now made with map making software that falls into one of three main types; Computer aided data management (CAD), Geographic Information Systems (GIS) and Global Positioning Systems (GPS).

Cartography has grown from a collection of drafting techniques into an actual science. Cartographers must understand which symbols convey information about the Earth most effectively, and make such maps that will encourage everyone to use the maps to find places or use it for their daily work. A cartographer must learn geodesy and fairly advanced mathematics to understand how the shape of the Earth affects the distortion of map symbols projected onto a flat surface for viewing.

"Geographic Information Systems" deals with the storage of information about the Earth for automatic retrieval by a computer in an accurate manner. In addition to other sub disciplines of geography, GIS specialists must understand computer science and

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database systems. Maps have traditionally been used to explore the Earth and to exploit its resources. GIS technology, as an expansion of Cartographic science, has enhanced the efficiency and analytic power of traditional mapping. Now, as the scientific community recognizes the environmental consequences of human activities, GIS technology is becoming an essential tool in the effort to understand the process of global change. Various map and satellite information sources can combine in ways that recreate the interactions of complex natural systems. Such visualization can help to predict what will happen to an area if it is repeatedly flooded, or what changes are expected if a particular industry is located or developed in an area.

Survey of India, inherited from the British Ordnance Survey, the NATMO is a premier organization for mapping in India. Its maps of one million series are well known. The organization of the Cartographic Unit in the 1960s at the French Institute, Pondicherry, brought a significant impact on the development of Geography in India. Its publication of Vegetation and Soil maps at the scale of 1:100000 were very well received for their cartographic appreciation and resource mapping. This Unit was upgraded in 1995 as a Genetics Laboratory with an emphasis on computer cartography and GIS.

b. Quantitative methods in Geography

These aspects of geographical techniques deal with numerical methods most commonly found in geography. In addition to spatial analysis, you are likely to find methods like cluster analysis, discriminant analysis in geographic studies. These statistical techniques are useful in finding patterns and identifying relationships between space and the activities that are performed in them.

c. Field Survey and Methods

Geographic research is based on both secondary and primary data. There are different types of surveys based on questionnaire or schedule and focused group discussion. Survey can cover all the inhabitants of the area (Census) or a small part of the total (sample survey).

1.5 BRANCHES OF GEOGRAPHY

Branches of Geography can be categorised in two broad groups:

Physical Geography

a. **Astronomical Geography:** It studies the celestial phenomena which concern the Earth's surface particularly Sun, Moon and Planets of the Solar System.

b. **Geomorphology:** It is concerned with the study of the landforms on the Earth's surface. It includes origin and development of landforms through erosional, transportational and

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depositional processes of water, wind and glaciers.

c. **Climatology:** Climatology is the study of the atmospheric conditions and related climatic and weather phenomena. It includes the study of atmospheric composition, climatic regions, seasons, etc.

d. **Oceanography:** It is concerned with the study of various types of Oceanic components and processes related to ocean floor depths, currents, coral reefs, and continental drifts etc.

e. **Soil Geography or Pedology:** It studies various soil forming processes, their physical, chemical and biological constituents, their color and types, texture, distribution and carrying capacity etc.

f. **Hydrology and water resources:** It comprises the study of all water bodies such as sea/oceans, rivers, lakes and elements of rainfall and snowfall (precipitation), and glaciers.

g. **Biogeography and environment geography:** It focuses on evolution and distribution of plants (flora) including grasslands and forest and animals (fauna), ecosystems and environment. Focus is on processes, types, distribution, human- nature relationships and the quality of the living environment including the elements of water, air and noise pollution, solid waste and waste water management.

Human Geography

a. **Anthropogeography:** It largely deals with racial phenomena in their spatial context.

b. **Cultural geography:** It focuses on the origin, components and impact of human cultures, both material and non-material over space. It comprises landscape characteristics, in terms of caste, race, religion, dialect and language, art and craft, literature, folk dance and music, cuisine and social norms and behaviors; its pattern and diffusion.

c. **Social geography:** It is the analysis of social phenomena in space. Poverty, health, education, livelihood are some important fields of study in social geography.

d. **Geography of Health:** It is a sub-branch of social geography which deals with issues related to mortality, morbidity (disease), and immunization etc. in its spatial context.

e. **Population geography:** It is the study of various dimensions of population such as demographic (population distribution, density, composition, fertility, mortality, migration) and socio-economic characteristics.

f. **Settlement geography:** It is the study of Rural/Urban settlements, their size, distribution, functions, hierarchy, and various other parameters of the settlement system. Nowadays, urban geography and rural settlement are taught as separate branches of human geography.

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g. **Economic geography:** It refers to the study of the location and distribution of economic activities at the local, regional, national and world scale. Economic geography can be studied under the following heads: resource geography, agricultural geography, industrial and transport geography.

h. **Resource geography:** It is defined as the study of the distribution and characteristics of resources, which distinguish one region from another, with interest focused on utilisation,

i. **Agriculture geography:** It focuses on cropping pattern, production and trade, input of agriculture, irrigation and marketing of products.

j. **Industrial geography:** It studies types of industries, their growth, spatial pattern, input and production and industrial policies.

k. **Transport geography:** It studies the transport network, accessibility and related issues.

l. **Political geography:** It is the study of political phenomena such as boundaries, geopolitical issues, delineation of constituencies and electoral issues in their spatial context. Main focus remains for creation and transformation of political and administrative regions

m. **Historical geography:** Spatial and temporal trends of geographical phenomena are studied in historical context.

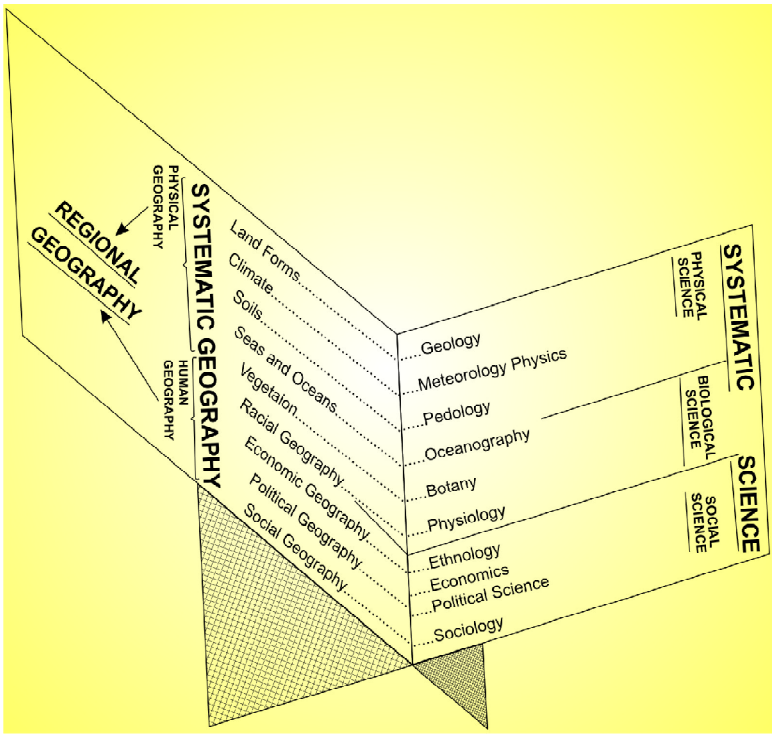

Fig. 1.1 Geography as an integrating science (Based on Hettner and Hartshorne)

1.6 GEOGRAPHY AS AN INTEGRATING DISCIPLINE

Geography is a peculiar discipline in the sense that it focuses on the integration of heterogeneous phenomena. Geography has its strong relation with mathematics, natural sciences, and social sciences. Geomorphology is closely related to geology and geophysics; oceanography and water resources with meteorology and hydrology; soil geography with agronomy; economic geography with economics, social/cultural geography with sociology; anthropogeography with anthropology, political geography with political science, environment geography and biogeography with botany and zoology. While other sciences deal with distinctive types of phenomena, geography studies several kinds of phenomena, each already studied by other sister disciplines. In an integrated manner thus, geography has firmly established itself as a discipline of synthesis. Fig. 1.1 gives the idea of integrating science

INTEXT QUESTIONS 1.3

1. What are the two branches of geography?
2. Name the tools and techniques of geographical study?
3. What is Anthropogeography?
4. What is the difference between social and cultural geography?
5. Why is geography considered an integrating discipline?

WHAT YOU HAVE LEARNT

- Geography is a science of space. Geography is both a natural and social science as it studies both the environment and the people. It is concerned with the different ways in which resources are used. It connects the physical and cultural world. Physical geography studies the earth systems that create natural environments.
- Earlier geography merely described places. Even though this is still a part of geography, the pattern of description has changed a lot in recent years.
- Geographical phenomena and processes are generally described by two approaches viz. (i) regional and (ii) systematic. Regional approaches are characterized by understanding the formation and characteristic of regions.
- Systematic approach is organized in terms of particular phenomena of general geographic significance. Each phenomena is studied in terms of the relations of its areal differentiations with the others.

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- Geography has two main branches: Physical and human. Physical geography is further subdivided into several other branches namely geomorphology, climatology, oceanography, soil and biogeography.
- Human Geography is also subdivided into other branches like, cultural, population, social, economic and political.

TERMINAL QUESTIONS

1. Define the term 'Geography'.
2. Why geography is called the mother of all sciences?
3. What are the two basic approaches in geography?
4. What are the four phases of development of geography?
5. Define the terms physical and human geography.
6. Why is human geography an important part of geography? Explain with suitable examples.
7. Distinguish between the followings:
   i. Systematic and regional geography.
   ii. Physical geography and human geography.
   iii. Population and economic geography.
   iv. Discuss the techniques of geographical studies.

ANSWERS TO INTEXT QUESTIONS

1.1.

1. Geography is largely the study of the interaction of all physical and human phenomena and landscapes created by such interactions.
2. The Earth's surface is changing because of the continuous interaction between the environment in which we live in and the way we use it.
3. Eratosthenes

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4. (a) Mathematical tradition,

   (b) Geographic information through travel and field work.

1.2

1. (i) Physical Geography

   (ii) Human Geography

   (iii) Biogeography

   (iv) Geographycal methods and teaching

2. (i) Regional studies

   (ii) Regional analysis,

   (iii) Regional development and

   (iv) Regional planning.

1.3

1. (i) Physical

   (ii) Human

2. (i) Quantitative methods

   (ii) Remote sensing/ GIS/GPS

   (iii) field survey methods

3. It deals largely with racial phenomena in their spatial context.

4. While other sciences deal with distinctive types of phenomena, geography studies several kinds of phenomena, each already studied by other sister disciplines. Thus in an integrated manner, geography as a discipline, analyses and synthesizes knowledge from diverse fields.

MODULE -2

Dynamic and Geomorphic Processes of the Earth

2. Endogenic Forces
3. Exogenic Forces and their Resultant landforms
4. Running water, moving ice, wind and sea waves