

CONCEPTS AND TRENDS IN GEOGRAPHY

UNIT-I

Field Of Geography:Nature-Branches-Approaches-Development Of Geographical Thought-Classical Period-Medieval Period:Greeks,Romans And Arabs

Geography is divided into two main **branches**: **human geography** and **physical geography**. There are additional **branches** in geography such as regional geography, cartography, and integrated geography.

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Human Geography

This is one of the major branches in geography and it mainly covers studies of the human race. This normally involves understanding a human population's backgrounds, how the interactions and the perceptions that members of that human population have for various ideologies affecting them.

In addition to this, the discipline also studies the way in which the groups of people that inhabit the Earth organize themselves in the particular regions that they inhabit.

Urban geography is the study of human populations in a built environment. A view of a suburban subdivision being developed in Atlanta, Georgia, USA. Image: USGS, public domain.

As a matter of fact, many other branches of geography normally fall under human geography.

Modern applications of human geography can include mapping human migration, showing the movement of food resources and how they impact communities, and the impacts climate change can have on humans living in vulnerable areas.

Human geographers study the effects of climate change on human movement, quality of life, and economy welfare. Flooding in Coralville, Iowa, June 13, 2008. Photo: Don Becker, U.S. Geological Survey. Public domain

Here are some example of disciplines in human geography:

- cultural geography
- economic geography
- health geography
- historical geography

- political geography
- population geography
- rural geography
- social geography
- transport geography
- urban geography.

Rural geography is one field of study in human geography. Photo: A white barn near West Fargo, ND, US, [Victoria Christensen, USGS Upper Midwest Water Science Center](#).

Physical Geography

Physical geography is a major branch of the science of geography, and it mainly deals with the study of the natural characteristics of the Earth.

It covers both features that are on the Earth's surface as well as those near it.

Physical geography allows us to chart landmasses, but physical geography is also being used to see what lies beneath the Earth's ice caps and oceans.

Glaciology is the study of glaciers and other ice related phenomena. A melting ice floe in the Arctic Ocean, August 12, 2009. Photo: [Patrick Kelley, U.S. Coast Guard](#). Public domain.

Researchers are using satellite technology to see the landmass that exists under [Antarctica](#); additionally, there is work that continues to be done to explore and map the physical makeup of the land underneath our oceans.

Some examples of disciplines studies in physical geography are:

- geomorphology
- climatology
- hydrology
- biogeography

Hydrology is the study of the movement and distribution of water on Earth. USGS hydrologists deploys a water conductivity/temperature/depth probe (AquaTroll) for a temporary study along the Madison River, Yellowstone.

Integrated Geography

Integrated geography can also be known as [environmental geography](#), or human-environment geography. Integrated geography takes human and physical geographic issues and molds them together.

Geographers use drones equipped with a thermal infrared camera to help them gather remote sensing data. Photo: [USGS](#), public domain

This area of geography is useful for connecting humans and the impacts we have on our natural environment.

[GIS](#) and [remote sensing technologies](#) can be used to show where humans have physically altered an environmental landscape. [Drones](#), [LiDAR](#), earth observation satellites, and aerial photography are all technologies that geographers have used to help them study the Earth.

For example, we can pinpoint where Iraqi wetlands have dried up due to overuse of the water resources there, and where conservation efforts have succeeded in renewing some of these wetlands more recently.



Satellites like those in the Landsat program help to monitor changes affected by the interactions of humans on Earth. Imagery captured by Landsat 5 and Landsat 8 captured changes in the Peruvian Amazon forest over time due to small-scale agriculture. Image: [USGS, public domain](#).

Integrated geography can be used to explore humanity's relation to the Earth as well as the Earth's relationship to people.

Regional Geography

Rather than look at geography on a global scale, regional geography breaks the science down into more specific areas.

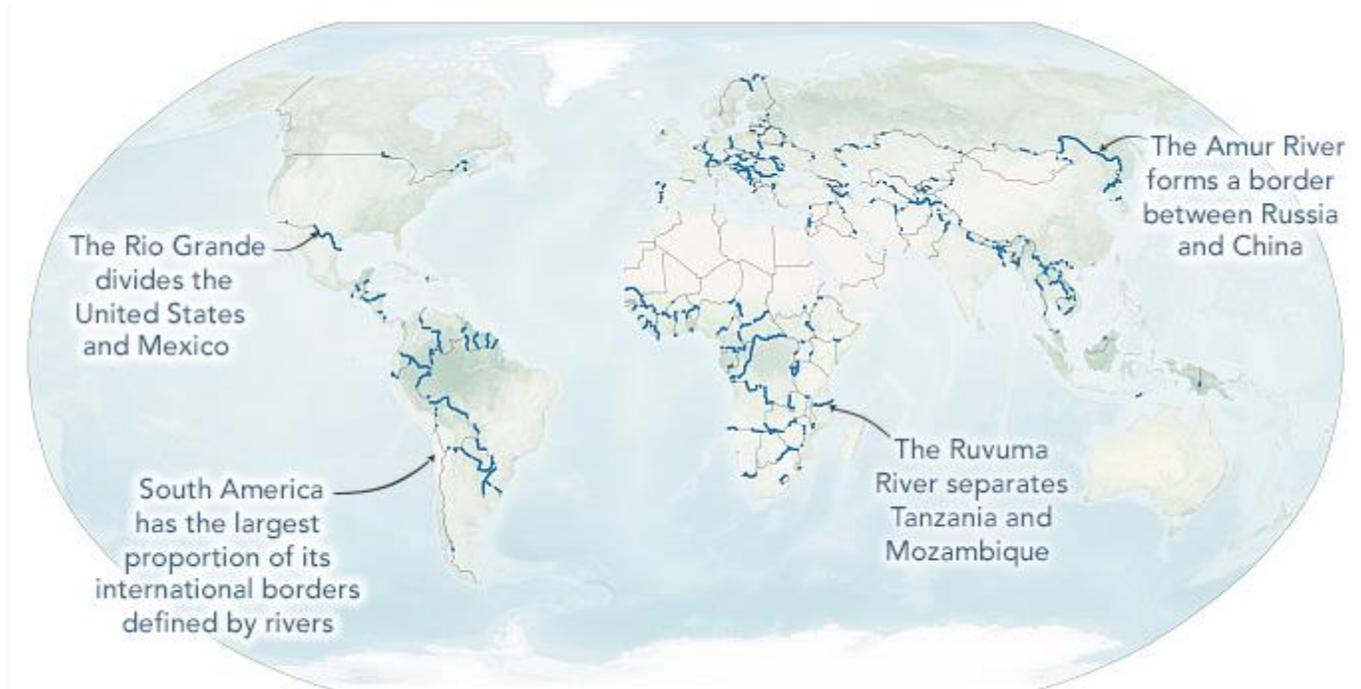
Regional geography looks at cultural and natural aspects of geography that are unique to a particular place. Regional geography could include parceling out locations by looking at different watersheds, or just looking at coastal areas, and so on.

Regional geographers study the interaction of different factors or geographic features at the regional level. View near Katla volcano in Iceland showing the landscape.

The most common example of regional geography is by country.

We take the borders that have been drawn out and look within those borders. Often the human geography contained within those countries is much more varied and diverse than we expect.

Natural borders such as rivers, mountain passes, or other large bodies of water often impact where borders are drawn.



This global map shows in blue all of the international borders defined by large rivers.
Map: [Lauren Dauphin, NASA](#), public domain.

An understanding of political and cultural factors in regional geography can help paint a clearer picture, too.

Geomatics

Geomatics is most closely related to GIS (Geographic Information Systems) and other geospatial sciences.

Geomatic engineers work to collect, distribute, store, analyze, process, and present data that they have gathered with regards to geographic information.

A high-precision Global Positioning System (GPS) survey is completed annually on Mauna Loa.
Photo: [R. Kramer, USGS](#). Public domain.

Geomatics uses different technologies to assist with the above goals. Jobs that work with geomatics can include urban planners, land surveys, space exploration, agriculture, and geomarketing.

Cartography

Geographers who study cartography are usually more involved in the mapping of things. In general, every geographer must have the essential knowledge that is required in displaying data on maps.

Cartography focuses on ways in which the entire mapping procedure can be technologically advanced by creating maps that are generally of higher quality.



Before the use of computer cartography, mapmaking was a manual process. Scribing of the intermediate contours for a USGS topographic map using a freehand scriber in 1957. Photo: [U.S. Geological Survey](#). Public domain.

On a conclusive note, geography is a very wide subject and this is why it is comprised of numerous sub-disciplines within it.

There are other branches within this science that have not been discussed, and some of the notable ones include: geographic education, historical geography, [GIS \(Geographic Information Systems\)](#), remote sensing, and quantitative methods.

There are some branches in geography that are generally interrelated to others, but there are other branches that have very different principalities in place.

Approaches to the Study of Geography

Geography has undergone several changes in its approach. The earlier geographers were descriptive geographers. Later, geography came to be developed as an analytical science. Today the discipline is not only concerned with descriptions but also with analysis as well as prediction.

There are two distinct approaches or methods to study geography. They are: Systematic approach and 2. Regional approach

Systematic Approach:

Systematic or nomothetic approach was introduced by Alexander Von Humbolt, a German geographer (1769-1859). In this approach a particular phenomenon is considered for detailed understanding. The study of specific natural or human phenomenon that gives rise to certain spatial patterns and structures on the earth surface is called systematic study. Generally, systematic geography is divided into four main branches.

1. Physical Geography: Study of various elements of earth systems like atmosphere (air), hydrosphere (water), lithosphere (rock) and biosphere (life) and their distributions.
2. Biogeography, including environmental geography: It focuses on various kinds of forests, grasslands, distribution of flora and fauna, human-nature relationships, quality of the living environment and its implications for human welfare.
3. Human Geography: It describes the human culture, population, dynamic socio economic and political aspects.
4. Geographical methods and techniques: It is concerned with methods and techniques for field studies, qualitative, quantitative and cartographic analysis.

Regional Approach:

It is otherwise called as ideographical approach. It was developed by Carl Ritter (1779 – 1859), a contemporary of Humbolt. The regions could be classified based on a single factor like relief, rainfall, vegetation, percapita income or there could also be multi-factor regions formed by the association of two or more factors. Administrative units like states, districts and taluks can also be treated as regions. The main sub branches of regional geography are : i) Regional studies ii) Regional analysis iii) Regional development and iv) Regional planning.



Geographical Data Matrix:

The matrix is a simple method of arranging information in rows and columns for better understanding of complex spatial problems. **Brian J.L. Berry** adopted this method from anthropology for studying geography more effectively. Geographic data can be arranged in a rectangular array or matrix. Row-wise group of variables represent the systematic or topical branches of geography while, regions are represented by columns. Berry has explained that regional synthesis could be derived with the help of a series of geographic matrices in correct temporal sequence. Each time period has been taken to be equivalent to a 'slice' of the three-dimensional cake. The diagram of '*Third Dimension*' makes it possible to examine rows and columns, cutting across time.

In the West during the second half of the 19th and the 20th century, the discipline of **geography** went through **four major phases**: environmental determinism, regional **geography**, the quantitative revolution, and critical **geography**

Development geography is a branch of geography which refers to the standard of living and its quality of life of its human inhabitants. In this context, development is a process of change that affects peoples' lives. It may involve an improvement in the quality of life as perceived by the people undergoing change.^[1] However, development is not always a positive process. Gunder Frank commented on the global economic forces that lead to the development of underdevelopment. This is covered in his dependency theory.

In development geography, geographers study spatial patterns in development. They try to find by what characteristics they can measure development by looking at economic, political and social factors. They seek to understand both the geographical *causes* and *consequences* of varying development. Studies compare More Economically Developed Countries (MEDCs) with Less Economically Developed Countries (LEDCs). Additionally variations within countries are looked at such as the differences between northern and southern Italy, the Mezzogiorno.

Classical period in geography

Although the roots of **geography**, as a field of study, reach back to **Classical** Antiquity, its establishment as a modern science was essentially the work of the century from 1750 to 1850. The second half of this **period**, the time of Humboldt and Ritter, is commonly spoken of as the “**classical period**” of **geography**.

Classical antiquity (also the classical era, classical period or classical age) is the period of cultural history between the **8th century BC** and the **6th century AD** centered on the Mediterranean Sea, comprising the interlocking civilizations of ancient Greece and ancient Rome known as the Greco-Roman world.

The modern period of geography began toward the end of the 18th cent. with the works of **Alexander von Humboldt** and Karl Ritter. Thenceforth two principal methods of approach to geography can be distinguished: the systematic, following Humboldt, and the regional, following Ritter.

In the history of Europe, the **Middle Ages** or medieval period lasted from the 5th to the late **15th century**. It began with the **fall of the Western Roman Empire** and transitioned into **the Renaissance** and the Age of Discovery.

Historians usually divide the **Middle Ages** into **three** smaller **periods** called the Early **Middle Ages**, the High **Middle Ages**, and the Late **Middle Ages**.

Features such as migration of people, invasions, **population distribution**, and deurbanization characterized this period. The medieval ages had three periods, which include the antiquity, the medieval periods, and the modern period, all of which exhibited different characteristics.

Eratosthenes

Eratosthenes. The first spot has to go to the man who coined the term geography, **Eratosthenes** (c. 275–194 BC). He created one of the earliest maps of the known world between 276-195 BC, but his greatest contribution was the concept of latitude and longitude.

Geographical Thought: Greeks And Romans

The Greeks

If you were to sit down to write a novel you would find strains of geographical description creeping into your work. Homer, and many others of that era were no different!

The epics of Homer, especially the Iliad and the Odyssey which contain the episodes of Trojan war (1280-1180BC) provide excellent accounts of historical geography of the then known world. Four winds coming from different directions are brilliantly described in his writings.

However, Homer had his limitations because he was essentially a poet and not a geographer. Formal study of the subject became pronounced with the works of Thales, Anaximander, Hecataeus, Herodotus, Plato, Aristotle, Eratosthenes, and Hipparchus.

Wind	Characteristics
Boreas	The North wind, strong and cool accompanied by clear blue skies

Eurus	The East wind, warm and gentle
Notus	The South wind, heralds an advancing storm, brings rain and can sometimes be violent
Zephyrus	The west wind, dreaded, balmy and blows with gale force

Thales of Miletus

Miletus, a town located near the mouth of the river Menderes, on the eastern side of the Aegean Sea, rose to fame in the 6th and 7th century B.C. with Thales, a brilliant Greek thinker.

He was the first Greek genius, philosopher, and traveller concerned with the measurement and location of things on the surface of the earth. He is credited with several basic theorems of geometry.

Thales initially a businessperson, in the course of a trip to Egypt found himself greatly impressed by the geometrical traditions of the Egyptians. He formulated six brilliant geometric propositions which were indeed path breaking in ascertaining latitude and longitude of places.

That

- the circle is divided into two equal parts by its diameter;
- the angles at either end of the base of an isosceles triangle are equal;
- when two parallel lines are crossed diagonally by a straight line the opposite angles are equal; the angle in a semicircle is a right angle;
- the sides of the two similar triangles are proportionate and two triangles are congruent if they have two angles; and,
- a side respectively equal are some geometric principles put forward by Thales.

In consequent years pondering over the shape of the Earth, Thales visualised earth as a disc floating in water.

Anaximander

Anaximander was a contemporary of Thales, and though his junior by a few years, contributed no less to classical geography. He devised an innovative instrument, the gnomon a sundial to measure time. This is one invention, which even you must be familiar with!

Hop over to your backyard or better still, the terrace, where there is ample sunshine, set a pole vertically above a flat surface and watch the varying position of the sun.

Then to measure time, calculate the length and direction of the shadow cast by the vertical pole.

At noon the shadow is the shortest, while at sunset or sunrise it is the longest.

Easy? In fact this may remind you of our own Jantar Mantars, built by Sawai Man Singh of Jaipur. Anaximander prepared a world map, placing Greece at the center surrounded by other Eurasian parts. It was a pioneering work!

Thus Anaximander and Thales are regarded as the founder of the mathematical tradition in the study of geography in ancient Greece.

Hecataeus

Miletus was filled with pride again when Hecataeus, born around 475 B.C., a gifted thinker, established a literary tradition, opposed to the mathematical tradition established by Thales and Anaximander.

His book *Geographica* (Description of the Earth) is regarded as the first attempt to put together available knowledge about the world systematically. Thus it is with reason that Hecataeus is acclaimed as the “Father of Geography”.

Hecataeus’s work was divided into two parts. The first documented geographical information about Europe, while the second dealt with Libya, which was the known section of land that is located in present day Africa and Asia.

The first volume provided vivid accounts of the Greek shores and the European coast of the Aegean Sea. Later, Hecataeus went on to add the geography of Adriatic, Italy and Spain. In the second volume he described Hellespont, the southern coast of Euxine up to Caucasia, Asia-Minor, Syria, Egypt and Libya.

Hecataeus endorsed the views of his predecessors of earth being a circular plane with Greece at the center. In fact this little world was surrounded by water, with two equally divided landmasses, Europe in the north and Libya in the south, with Greece occupying the center. You will be surprised to find a description of India in the work of Hecataeus. He not only plotted India but also mentioned the Indus, several cities as well as many tribes, foremost among which were the Gandari people who occupied the country between the upper Indus and the valley of Kabul.

Plato

Plato (428-348 B.C.), though more synonymous with philosophy, did make important contributions to the development of geographical concepts.

A great proponent of deductive reasoning, Plato is regarded as the first scholar to propound the idea of the earth being a sphere located at the centre of the universe, and all the other celestial bodies including the sun, revolving around it. A revolutionary revelation for the times!

Herodotus

Although you may be familiar with Herodotus (485-425 B.C.) as the father of history but his significantly original contributions towards geography cannot be disregarded.

Herodotus’s view of interdisciplinary study, treating history geographically and geography historically, may be especially understood in the present context, where we seek to understand any phenomenon in the light of totality rather than specificity.

Thus he pioneered a novel, synthetic approach to study the discipline.

Herodotus born at Halicarnassus in the 5th century B.C., lived at Athens, the centre of Hellenic culture. His views about the shape of the earth departed from those of Hecataeus, accepting instead the Homeric view that the earth was a flat disc over which the sun travelled in an arc from east to west.

In fact it was Herodotus who first drew a meridian on the world map. He theorized the flow of the Nile, and was the first geographer to regard the Caspian as an inland sea, opposed to what his contemporaries considered an arm of the Northern Ocean.

Herodotus divided the landmass of the world into three continents, Europe, Asia and Libya (Africa). While he described Europe and Asia in some detail, his knowledge of Asia was confined mainly to the Persian Empire.

Aristotle

Arguing from the particular to the general, inductive reasoning was Aristotle's gift to theorists. He believed that the best method of building a reliable theory was to begin with the observation of empirical facts.

Aristotle thus successfully laid the foundation of world's first paradigm to guide research procedures.

Aristotle was perhaps one of the earliest determinists. He proposed varying habitability of the earth with varying latitude and established it as a function of distance from the equator.

Well, that would mean, that living close to the equator with its searing heat would be impossible, and the poles would be inhabitable too as one would hardly want to constantly face the chilling winds and cold weather.

Erastosthenes

Erastosthenes (276-194 B.C.) is credited to have coined the term geography! How? Well, he added 'ge' meaning earth, to 'graphie' meaning study, and viola we have 'geography'.

Erastosthenes was the author of the first formal text on geography, 'The Geographica'. Born in a Greek colony Cyrene, Libya, he was educated here and later at Athens.

At Athens the highest academic honour of the times was bestowed on him, when he was invited by the ruler of Egypt, Ptolemy Euergetes to be appointed as a librarian of the museum at Alexandria. Under the guidance of

Erastosthenes, the museum metamorphosed into an eminent center of astronomical research.

Erastosthenes is known to have identified five climatic zones, a torrid zone, two temperate zones, and two frigid zones.

While the area 24° north and south of the equator was designated as the torrid zone, the areas 24° from each pole were the frigid zones. The areas in between were the two temperate zones.

Erastosthenes also attempted to determine how far our earth is from the sun and the moon.

Hipparchus

Hipparchus succeeded Erastosthenes as the librarian at the museum of Alexandria, around 140 B.C. He was the first to divide the circle into 360 degrees, based on Assyrian arithmetic.

An instrument devised by him, the 'astrolabe', was used for the determination of longitudes and latitudes. It opened up many avenues, making it possible to measure latitude at sea by simply observing the angle of the polar star.

Hipparchus's another brilliant work was the conversion of a three dimensional sphere into a two-dimensional plane, which facilitated the representation of the earth on paper.

If you have ever read the fine print at the bottom of each page in an Atlas, you would be familiar with projections. Here is where it all began! Hipparchus devised two kinds of projections, orthographic and stereographic, which allowed the curved sphere of the earth to be converted into plane surface on sound mathematical principles.

The Romans

Romans carried forward the Greek tradition of contributions to the development of geography.

The fields of historical and regional geography saw considerable progress, with Strabo and Ptolemy being the leading proponents, and Polybius and Posidonius contributing significantly to the study of physical geography.

Strabo

Strabo (64 B.C. to 20 A.D.) was born south of Black Sea in a Turkish town of Amasia, capital of the Barbarian kings, and supporting a large Greek population. Strabo's main contribution was his attempt to bring together all the existing geographical knowledge in the form of a general

treatise.

His seventeen- volume work titled 'Geography' was an encyclopaedic description of the world known to the Greeks. The first two volumes had in them a review of the work of other geographers since the time of Homer, while eight volumes were devoted to Europe, six to Asia, and one to Africa.

Strabo's historical work, introduced history of a country alongside its geography, while highlighting the intimate connection and interplay between the two.

He also attempted to trace the influence of the physical features on the character and the history of the inhabitants. Strabo's book targeted a specific group of readers such as administrative officers, statesmen, and commanders of the Roman Empire.

The purpose was to provide ready-at-hand information about people and places to aid the imperial officers in accomplishing their tasks easily. Strabo's work thus laid down firm foundation for chronological writing in geography.

Ptolemy

Claudius Ptolemy (90-168 A.D.), a native of Egypt, wrote an eight volume work, the 'Guide to Geography', which consisted of discussions on map projections (first volume), tables of latitudes and longitudes (six volumes) and maps of different parts of the world (eighth volume).

His best known works include the "Almagast" which dealt with complicated problems of mathematical geography and astronomy long remaining the most standard reference on the movement of celestial bodies.

Ptolemy firmly believed that geography is a science that deals with the art of map-making. He aimed at 'reforming' the map of the world on the basis of astronomical principles.

Ptolemy was far ahead of his contemporaries in the mathematical construction of map projection. It was Ptolemy who for the first time plotted the Gangetic Gulf or the Bay of Bengal, as it is presently known. He showed the source of the Ganges and also its main tributary flowing down from the Himalayas.

Although Ptolemy's calculations of latitudes and longitudes have been found erroneous, as it was based on the estimated lengths of the journeys between the places, however its great scholarly importance cannot be ignored or belittled.