CONCEPTS AND TRENDS IN GEOGRAPHY

UNIT-V

RECENT TRENDS IN GEOGRAPHY-HUMAN ECOLOGY-WELFARE GEOGRAPHY-SUSTAINABLE DEVELOPMENT-GEO-SPATIAL TECHONOLOGY

Geography (from Greek: γεωγραφία, *geographia*, literally "earth description") is a field of science devoted to the study of the lands, features, inhabitants, and phenomena of the Earth and planets. The first person to use the word γεωγραφία was Eratosthenes (276–194 BC). Geography is an all-encompassing discipline that seeks an understanding of Earth and its human and natural complexities—not merely where objects are, but also how they have changed and come to be.

Geography is often defined in terms of two branches: human geography and physical geography. Human geography is concerned with the study of people and their communities, cultures, economies, and interactions with the environment by studying their relations with and across space and place. Physical geography is concerned with the study of processes and patterns in the natural environment like the atmosphere, hydrosphere, biosphere, and geosphere.

The four historical traditions in geographical research are spatial analyses of natural and the human phenomena, area studies of places and regions, studies of human-land relationships, and the Earth sciences. Geography has been called "the world discipline" and "the bridge between the human and the physical sciences"

The **history of geography** includes many histories of geography which have differed over time and between different cultural and political groups. In more recent developments, geography has become a distinct academic discipline. 'Geography' derives from the Greek γεωγραφία – *geographia*,[1] literally "Earth-writing", that is, description or writing about the Earth. The first person to use the word *geographia* was Eratosthenes (276–194 BC). However, there is evidence for recognizable practices of geography, such as cartography (map-making), prior to the use of the term.

Human ecology is an interdisciplinary and transdisciplinary study of the relationship between **humans** and their natural, social, and built environments.

Human Ecology is the study of the interactions between man and nature in different cultures. **Human Ecology** combines the ideas and methods from several disciplines, including anthropology, sociology, biology, economic history and archeology.

Welfare geography is an approach to **geography** where the emphasis is on spatial inequality and territorial justice.

The Welfare Geography Approach

The welfare geography approach deals with the issues related to inequality and injustice. The approach grew up as a reaction to the quantitative and model-building traditions of the 1960s.

In the 1970s there was a major redirection of human geography towards social problems, viz., poverty, hunger, crime, racial discrimination, access to health, education, etc. The issues such as the distribution of the fruits of economic development received attention mainly as a result of dramatic socio-political changes in Eastern Europe and South Africa.

Therefore, the basic emphasis of welfare geography is on who gets what, where and how. The 'who' suggests a population of an area under review (a city, region or nation). The 'what' refers to various facilities and handicaps enjoyed and endured by the population in the form of services, commodities, social relationships, etc. The 'where' refers to the differing living standards in different areas? And 'how' reflects the process by which the observed differences arise.

According to the Dictionary of Human Geography edited by R.J. Johnston, D. Gregory and David M. Smith (1994), "in a spatially disaggregated society, the general level of welfare may be written as:

$W = f\ (S_1 \ldots\ldots. S_n)$,
Where S is the level of living or social well-being in a set of n territorial subdivisions. In other words, welfare is some function of the distribution of goods and bads among groups of the population defined by area of residence.

Social well-being may be defined in terms of what people actually get, as follows:

$S=f(X_1,\ldots X_m)$,

where X represents the quantity of the m goods and bads consumed or experienced. Social well- being may also be expressed in terms of the distribution within the area in question:

$S = f (U_1\ldots U_k)$

Where U is the level of well-being, satisfaction or 'utility' of each of the k population subgroups. In all the above expressions,, the terms may be weighted differentially and combined according to any function, to represent the combination of territorial levels of well-being, goods and bads or group well-being that maximises the objective function (W or S)."

For identifying disparity in territorial distribution, developing social indicators is of extreme importance. Such indicators may be as follows: income, employment, housing, education, social orders, social participation, etc.

The welfare approach found Neo-classical economics least suitable to explain social inequality. The Marxian economics provides a useful tool for analysing social problems, because of the inherent tendency of capitalism to create disparity.

The second level of explanation deals with the process of how specific elements of a socio-political- economic system operate. D.M. Smith (1977), in his Human Geography: A Welfare Approach, first suggested the approach which later merged with other approaches of geography dealing with the issues of inequality.

The issues dealt by welfare geography demand an interdisciplinary approach of the highest order. And, in a rapidly changing era of globalisation where the developing South stands deprived vis-avis the advanced North, there has been a renewed interest in welfare geography.

Sustainable development

Sustainable development is the organizing principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend. The desired result is a state of society where living conditions and resources are used to continue to meet human needs without undermining the integrity and stability of the natural system. Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability goals, such as the current UN-level Sustainable Development Goals, address the global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice.

While the modern concept of sustainable development is derived mostly from the 1987 Brundtland Report, it is also rooted in earlier ideas about sustainable forest management and twentieth-century environmental concerns. As the concept of sustainable development developed, it has shifted its focus more towards the economic development, social development and environmental protection for future generations. It has been suggested that "the term 'sustainability' should be viewed as humanity's target goal of human–ecosystem equilibrium (homeostasis[*contradictory*]), while 'sustainable development' refers to the holistic approach and temporal processes that lead us to the end point of sustainability".[1] Modern economies are endeavouring to reconcile ambitious economic development and obligations of preserving natural resources and ecosystems, as the two are usually seen as of conflicting nature. Instead of holding climate change commitments and other sustainability measures as a remedy to economic development, turning and leveraging[*clarification needed*] them into market opportunities will do greater good.[*unbalanced opinion?*] The economic development brought by such organized principles and practices in an economy is called Managed Sustainable Development (MSD).[*attribution needed*]

The concept of sustainable development has been, and still is, subject to criticism, including the question of what is to be sustained in sustainable development. It has been argued that there is no such thing as a sustainable use of a non-renewable resource, since any positive rate of exploitation will eventually lead to the exhaustion of earth's finite stock;[2]:13 this perspective renders the Industrial Revolution as a whole unsustainable.[3]:20f[4]:61–67[5]:22f It has also been argued that the meaning of the concept has opportunistically been stretched from 'conservation management' to 'economic development', and that the Brundtland Report promoted nothing but a business as usual strategy for world development, with an ambiguous and insubstantial concept attached as a public relations slogan. (see below).

Geospatial Technology is an emerging field of study that includes **Geographic** Information System (**GIS**), Remote Sensing (RS) and Global Positioning System (GPS)It may be used to reveal spatial patterns that are embedded in large volumes of data that may not be accessed collectively or mapped otherwise

Geospatial technologies are systems that acquire and handle location-specific data about Earth. Remote sensing, the global positioning system (GPS), and geographic information systems (GIS) are important geospatial technologies. Remote sensing and the GPS are methods for collecting information about Earth's surface; GIS ia a mapping tool for organizing and analyzing information.

Remote Sensing

All methods of collecting information about Earth without touching it are forms of remote sensing. For example, photographing a flooded river from an airplane is a form of remote sensing, but sampling its water is not. Scientists mount remote-sensing devices such as cameras and radars on ships, airplanes, or satellites that can cruise above the land, sea, or ocean floor, collecting data from large areas quickly. Most remote-sensing technologies use electromagnetic waves (light or radio waves) because they are fast, interact in revealing ways with solid matter, and can pass easily through both air and vacuum.

Active or Passive.

A given remote-sensing technology may be either active or passive. Passive remote-sensing technologies collect whatever waves happen to be coming their way and form them into an image. They usually are tuned to a particular band of the electromagnetic spectrum, such as visible light or infrared light (heat radiation). Active remote-sensing systems, on the other hand, beam radio pulses, sound waves, or laser beams at their targets and construct an image from the echoes.

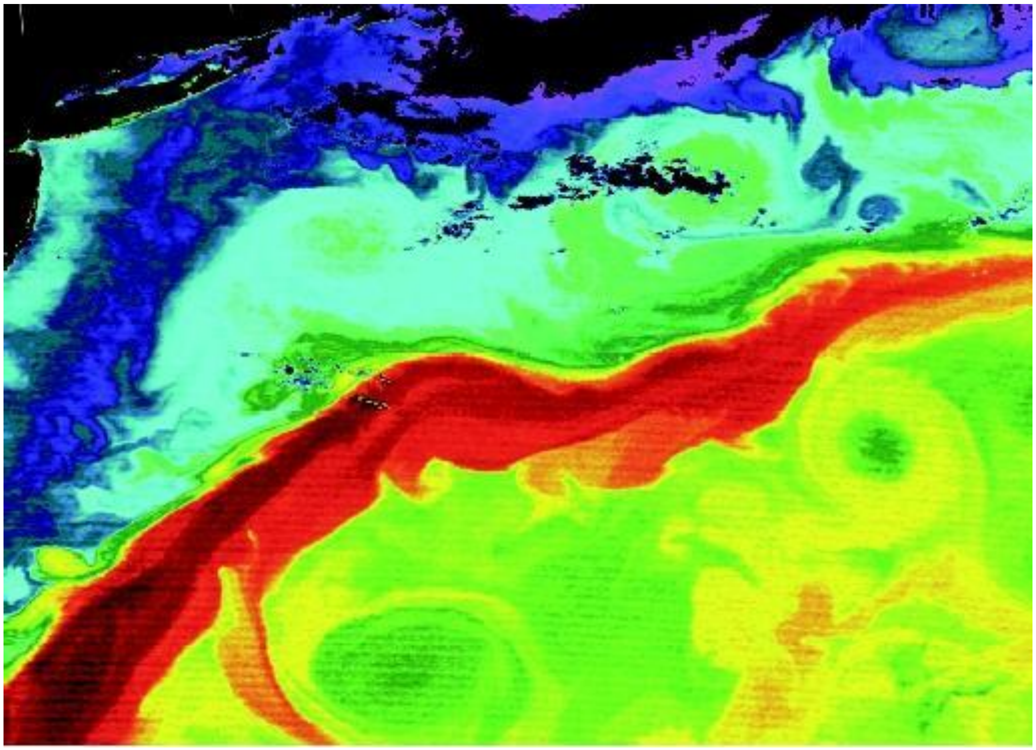
Remote sensing is important for water science because water is widely distributed. Precipitation falls unevenly and intermittently over large areas; rivers drain irregularly-shaped watersheds; lakes are dotted randomly over vast territories. On-site measurements provide accurate information at single points, but aircraft or satellites observe entire landscapes at once. Furthermore, remote-sensing observations are easy to repeat; a satellite, for example, may pass over the same part of the Earth repeatedly. It is straightforward to image the same part of Earth repeatedly from space, making it possible to monitor both local and large-scale changes.

Remote-sensing imagery acquired by passive and active systems has been used for almost every conceivable type of water-science research, including the study of waves, currents, and oceanic circulation patterns; the detection of marine organisms; the inventorying of lakes; and the mapping of **wetlands** , ocean floors, land-water boundaries, **floodplains** , ice movement, snow cover, oil spills, shoreline changes, and many other features. Remote-sensed data are key in flood prediction and prevention, irrigation and drainage studies, water quality management, **groundwater** protection, and other water resource investigations.

Satellites.

The Landsats (for *land* -sensing *sat* ellites) have for decades been the most important remote-sensing satellites, though many others also have been launched. The first Landsat was lofted by the United States in 1972 and the seventh was functioning as of 2002. Landsats circle Earth at a low altitude of 420 to 912 kilometers (260 to 570 miles), passing over the North and South Poles rather than circling the equator. This path means that Earth rotates inside the circular orbit of each satellite, constantly presenting new territory to the satellite's view. The data collected by the Landsats are made publicly available by the U.S. government.

Satellite images often record visible light or other forms of radiation. Visible-light images are useful for determining the locations and sizes of rivers, lakes, ice-covered or snow-covered areas, and other surface features. Images made from infrared light (which can be felt on the skin as radiant heat but not seen) provide different information. For example, infrared images can reveal heat **plumes** in bodies of water such as those occurring when a nuclear power plant disposes of hot water from its cooling system into a river. Creating detailed maps of such heat plumes by taking on-the-spot temperature readings would require thousands of measurements over a large



The core of the Gulf Stream, shown in this satellite view off the east coast of the United States, is evident by the red color. Several clockwise-rotating warm-core eddies are visible north of the Gulf Stream, whereas counterclockwise-rotating cold-core eddies are seen to its south. Near the coast, shallower waters have warmed due to solar heating, while the deeper offshore waters (in blue) are cooler.

area of moving water, an effectively impossible task. Infrared images also are used to classify vegetation cover by type, to monitor droughts, to visualize changes in ocean currents, and for other water-related purposes.

Radar.

Radar works by sending radio pulses toward objects and recording how long the echoes take to return, and is the most common active remote-sensing technology. Radar is a superb tool for measuring relief (i.e., the height variations of land or water surfaces). Precise knowledge of topography (land relief) is essential to understanding the collection of rainwater and snowmelt by rivers, which is in turn useful for flood prediction, agriculture, and other purposes. Radar observations of water waves give information on winds and currents; satellite-based radar also has mapped subtle variations in sea level due to irregularities in Earth's gravitational field.

Radio waves pass readily through clouds and ice. Radar's ability to see through ice makes it an ideal tool for measuring the thickness of ice and snowfields. The Greenland and Antarctic ice caps, which contain nearly 87 percent of the world's fresh water, have been sounded with radar, leading to the discovery of over 70 Antarctic lakes. One, called Lake Vostok, is the size of Lake Ontario and is buried beneath kilometers of ice.

Radar studies of water and ice are not limited to Earth. The U.S. National Aeronautics and Space Administration (NASA) has proposed that spacecraft-mounted radar be used to peer through the icy crust that covers Europa, one of the moons of Jupiter, to see whether a global ocean lies hidden beneath it. The European Space Agency's Mars Express mission, scheduled for launch in 2003, was expected to carry radar to map ice deposits in the soils of Mars.

Sonar.

Sonar, another active remote-sensing technology, is similar to radar but uses sound waves rather than radio waves. Most of the world's water, the 97 percent that is contained in the oceans, can be explored only superficially using light or radar because water absorbs electromagnetic waves. This makes sonar the only remote-sensing technology that can explore the bulk of the world's seas and other deep waters. Sonar systems mounted on ships' hulls or in special torpedoes towed behind ships ("sonar fish") have been used since World War II to map the ocean-floor topography of the world, and the knowledge thus gained has revolutionized the knowledge of geology. [*]

Global Positioning System (GPS)

GPS is a system of twenty-four satellites that allows the coordinates of any point on or near Earth's surface to be measured with extremely high precision. The satellites of the GPS are arranged evenly around the Earth so that at least four are visible at all times from any point on Earth's surface. As one satellite sets below the horizon, another always rises somewhere else.

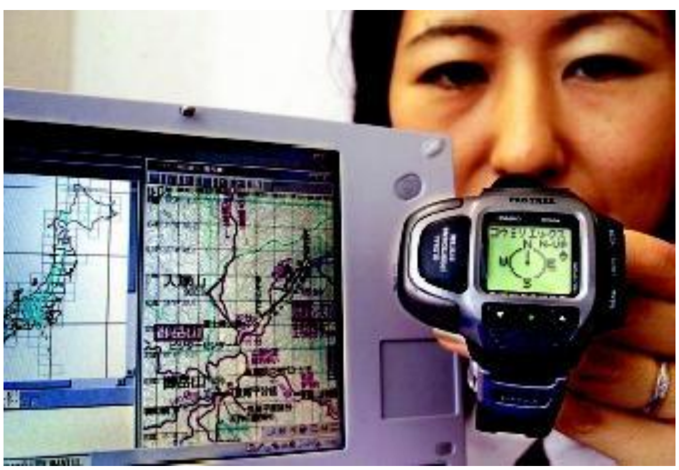
A special GPS receiver unit, usually handheld, is used to receive signals broadcast by the GPS satellites and to compute its own location from those signals. The GPS is a high-tech shortcut to the goal that surveyors and navigators have long sought by slower, less accurate means: namely, precise knowledge of one's own location. The GPS has only been in widespread use since more affordable GPS receivers first became available in the early 1990s.

The coordinates supplied by a GPS receiver must be matched to other data to be meaningful. A GPS receiver relays where something is located, but a human operator must specify what that something is: a rainfall measurement, well, or some other datum or object. The GPS is not a remote-sensing system because it does not collect data about the Earth. Rather, it facilitates the collection of data at specific points on Earth's surface.

For example, after Hurricane Dennis eroded beaches along the North Carolina shore in 1999, crews from the U.S. Geological Survey drove trucks along 80 kilometers (50 miles) of beach, mapping the new shoreline with GPS receivers. Aerial photography and airborne scanning lasers also were deployed to examine the altered coastline. These remote-sensing missions imaged more coastline than GPS, but with lower precision. Additionally, in 1998, researchers used GPS to accurately locate wells near the South Platte River in Colorado. This dataset was combined with satellite images of crop patterns and surface-water resources to determine how much water could be drawn from the wells and from the surface resources without depleting either.

Geographic Information Systems (GIS)

GIS is a computer system that can be used for scientific research and for water planning and management. This technology integrates powerful computer capabilities with the unique visual perspective of a good old-fashioned map.



This 84-gram wristwatch receives transmissions from twenty-four Earth-orbiting Global Positioning System (GPS) satellites. The wearer's location can be precisely determined and portrayed on the digital map of a computer screen.

It allows users to assemble, store, manipulate, and display geographically referenced information—data that can be identified according to its locations.

GIS requires the use of computer hardware, software, data, and specialists to study data related to Earth and the interconnections between its various features. GIS links information about where things are with information about what things are like. It is much more sophisticated than a paper map, as it can combine many layers of information about a particular spatial area to help yield a better understanding of that place. The layers of information to be studied depend on the researcher's purposes.

The information organized in a GIS comes from many sources, including remote sensing, the GPS, censuses, rock and soil samples, stream gage systems, weather stations, and wildlife sightings. GIS stores information about a geographic area as a collection of themed layers or maps. An individual layer can be anything that contains similar features (e.g., lakes, streets, postal codes, agricultural lands). Reliable and accurate data are necessary for creating high-quality GIS maps.

GIS is utilized in many industries, including business, transportation, communications, and defense; similarly, GIS is an important tool for analyzing water policy and science issues. [*] Because all the layered maps in a given GIS cover the same geographic area, it is possible to link and compare different kinds of data. For example, information about a river network or watershed can be compiled using GIS. A watershed represents the landscape view of water resources, and the effects of spatial patterns of soils, land use, land cover, and urban development can be studied.

Combining topography with vegetation and soil type, for example, may help hydrologists understand how water drains from a given landscape, and thus enable them to predict flooding or pollution transport. GIS makes it possible for earth scientists, city planners, farmers, the military, water resource managers, and many other users to handle the vast quantity of information available from remote sensing, GPS, geology, biology, and other sources.

GIS and other geospatial technologies provide significant input for the management and analysis of large volumes of data, allowing for better understanding of environmental processes and for better management of human activities to ensure environmental quality and economic vitality.

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