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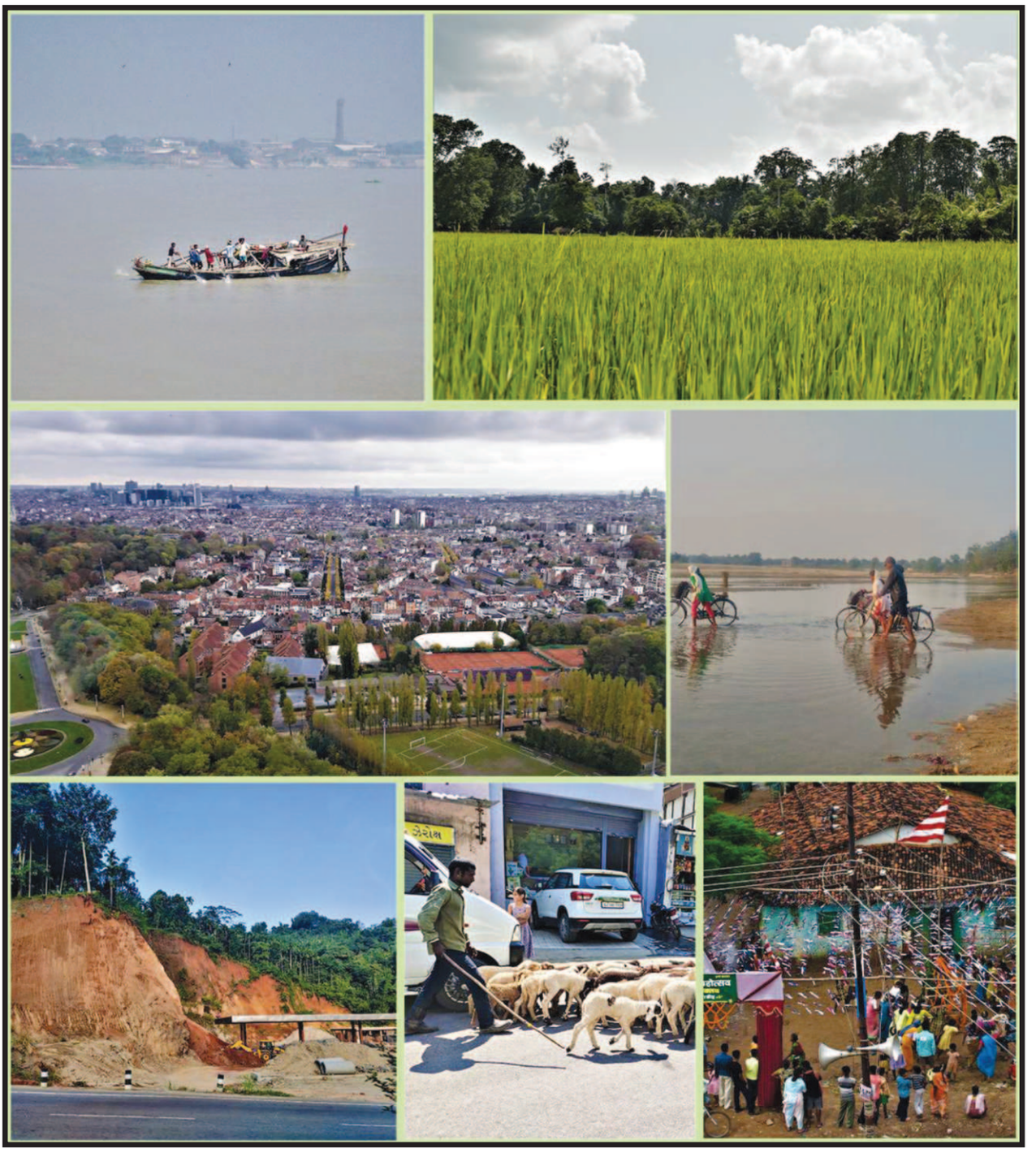
HUMAN GEOGRAPHY



FUNDAMENTALS, SPACE AND SOCIETY, POPULATION AND HUMAN SETTLEMENTS

Indira Gandhi National Open University
School of Sciences

BGGCT - 132
HUMAN GEOGRAPHY

Block

1 & 2

FUNDAMENTALS, SPACE AND SOCIETY

BLOCK 1

HUMAN GEOGRAPHY FUNDAMENTALS

BLOCK 2

SPACE AND SOCIETY

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HUMAN GEOGRAPHY: INTRODUCTION

Human geography is one of the two main branches of geography. Physical geography is the other main branch. The basic philosophy of introducing human geography is to make learners aware about spatial differentiation and organisation of human activities and interrelationship with earth and its environment. This course has four modules called blocks- 1. Human Geography Fundamentals, 2. Space and Society, 3. Population, and 4. Human Settlements covering various dimensions of human society with reference to geography.

Block 1 is about the fundamentals of human geography, which includes definition, nature and scope of human geography, concepts in human geography, perspectives on human-environment relationships and human adaptation to the environment. It is basically to know about the human geography fundamentals and understand the human-environment interactions with coexistence.

Block 2 mainly deals with peopling and racial elements, religion and beliefs, languages and cultural regions as studying space and society under human geography is very essential because understanding society over space are primordial to understand human geography. geography is the study of both physical and human phenomena. Therefore, the study of geography remains incomplete without studying human aspects. This block addresses the human society in terms of peopling and racial elements, religion and beliefs, languages and cultural regions.

Block 3 is about one essential part of human geography, i.e. human population with its various aspects like distribution and growth, population characteristics in terms of declining sex ratio, particularly child sex ratio, demographic dividend, skill formation, etc; human migration and population and resources.

Block 4 is about the human settlements with broad introduction and classification based on size, forms and functions; rural and urban settlements with nature, evolution, classification and morphology and urbanisation including urbanisation as a process, urbanisation and problems, and trends of urbanisation in developed and developing countries. The concluding section deals with problems of urbanisation and urban growth.

We hope that after studying this course, you will be aware of the fundamentals of human geography with human-environment relationships and understand society in relation to space. It is also expected that you will be acquainted with the distributions and dynamics of world population and be able to explain the aspects of rural and urban settlements and urbanisation.

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HUMAN GEOGRAPHY

Block

1

HUMAN GEOGRAPHY FUNDAMENTALS

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BLOCK 1: HUMAN GEOGRAPHY FUNDAMENTALS

This block gives an overview about the fundamentals of human geography as a foundation with concepts in human geography. It also deals with various perspectives on human - environment relationships and human adaptations to the environment. The block highlights the human - environment adjustments and equilibrium in adjustment for sustainable co-existence.

Unit 1: Nature and Scope of Human Geography: This unit contains the definition of human geography; development of human geography focussing the age of cosmology and exploration, modern period and post modern period; nature and perspective of human geography; scope and branches of human geography and relevance of human geography.

Unit 2: Concepts in Human Geography: This unit deals with the concepts in human geography mainly scale, time and space; area, place and region; network, spatial interactions, location and spatial distribution, hierarchies and spatial organization, and society and culture.

Unit 3: Perspectives on Human-Environment Relationships: This unit discusses the approaches to the study of human-environment relationship; Determinism as human-environment interaction, Possibilism as human-environment interaction, Neo-determinism as human-environment interaction, human-environment adjustments including geographical factors in organizing human activities, modifications of environment and human's adaptation with modifications in environment, and equilibrium of adjustments between human and environment.

Unit 4: Human Adaptation to the Environment: This unit is about the basics of human adaptation to environment, concept of livelihood, pre-agrarian, agrarian, and industrial modes of activities; human adaptations in various conditions- cold region (Eskimo), hot region (Pygmy, Bushman, Irulas and Bedouins), plateau region (Gonds and Maasai), mountain region (Gujjars and Nagas); adaptation in urban/industrial environment and forms of adaptation in hazards.

It is expected that after studying this Block, you will have good understanding about human geography in terms of its definition, nature and scope and basic concepts. You will also have adequate exposure to the perspectives on human-environment relationships through various approaches alongwith human adaptation to the environment in different physical or environmental conditions with suitable examples.

UNIT 1

NATURE AND SCOPE OF HUMAN GEOGRAPHY

Structure

1.1 Introduction
Expected Learning Outcomes
1.2 Definition
1.3 Development of Human Geography
Age of Cosmography and Exploration
Modern Period
Post–Modern Period
1.4 Nature and Perspective of Human Geography
1.5 Scope and Branches of Human Geography
1.6 Relevance of Human Geography
1.7 Summary
1.8 Terminal Questions
1.9 Answers
1.10 References and Further Reading

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1.1 INTRODUCTION

You have studied geography at school level and some of you may have also studied human geography at the senior secondary level. This unit will further help you understand the nature, perspective and scope of human geography as an important branch of knowledge. It also describes the relevance of human geography. Knowledge is not fixed. It changes with time. It is, therefore, necessary to understand developments in the field of human geography over time. As knowledge grows, new areas are discovered and thus new branches evolve and develop. Of course, in this process old ones are abandoned or relegated.

Geography has two major sub-disciplines – Physical and Human Geography. Physical geography is defined as the integrated study of the natural or physical environment on or close to the earth surface whereas human geography is concerned with human activities over the earth surface. In other words, human geography studies the built environment or human-made spaces or structures in which people live, work and recreate such as houses, roads, canals, temples, playgrounds and stadia, etc. It also attempts to

understand the modifications and adaptations as responses to the natural environment in organising human activities. In other words, human geography studies the processes of shaping human beings and their activities in various environmental conditions over the earth surface. It is also related to the study of location and spatial relations of human activities over the earth surface. One of the unique characteristics of human geography lies in its approach to study things and phenomena in wholistic or integrated manner, not independently, to find answers to 'what' is 'where' and also to explain 'how' and 'why' things are as they are. The objective of human geography is not only to describe the world as it appears but also to understand as to how the world has taken its present shape, what processes and factors have been involved in shaping the present world? In a nutshell, it answers 'what' is 'where' (what is located where), or the patterns (geographical/spatial distribution), 'how' (process of existence) it has come to be found where it is, and what factors have been responsible for that (causal relationships).

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- define human geography and get acquainted with the development of human geography as a major sub-discipline of geography;
- become familiar with the nature and scope of human geography; and
- understand the various perspectives employed to the study of human geography in general and its sub-branches in particular, and understand the relevance of human geography in the field of knowledge.

1.2 DEFINITION

The Dictionary of Human Geography defines human geography as "a part of the discipline of geography concerned with the spatial differentiation and organisation of human activity and its interrelationships with the physical environment" (Johnston, et al. 2009, p. 350). It is "A major field of geography that is centrally concerned with the ways in which place, space and environment are both conditions and are consequences of human activities." (Johnston, et al. 2009, p. 350). The Oxford Dictionary defines human geography as "the branch of geography dealing with how human activity affects or is influenced by the earth's surface."

Huntington in his book "Principles of Human Geography" in 1922 (after completing the physical background part wise) primarily looked at the human aspects in relation to the natural ones. He defines human geography as "the study of the relation of geographical environment to human activities." Vidal de la Blache in his book "Principles of Human Geography" says: "human geography offers a new conception of the inter-relationships between earth and man- a conception resulting from a more synthetic knowledge of the physical laws governing our earth and of the relations between the living being which inhabit it."

The father of modern human geography, Friedrich Ratzel, who wrote the book 'Anthropogeographie', defined human geography as the synthetic study of relationship between human societies and earth's surface." Later on Ellen Churchill Semple defined human geography as "the study of the changing relationship between the unresting man and the unstable Earth." Albert Demangeon defined it as "the study of human groups and societies in their relationship to the physical environment."

According to the above definitions, human geography is the spatial study of human and human activities in relation to physical environment. It means the spatial pattern of landscape created by human in various physical conditions as both active as well as passive agent. Geographers in the early parts of 20th century were of the opinion that the physical environment impacts and governs human lives and livelihood, culture and society. This perspective was known as **Environmental Determinism**. However, their idea didn't find many followers later. It is important to note that the interrelationships between the physical environment and humans have been long and complex. In the early stages of social evolution, human life was greatly impacted by the physical conditions. However, as humans developed tools, technologies and institutions, they modified the physical environment and brought about enormous changes on the face of the earth. Human is continuously active and so is the nature through its various processes. In this continuous process, physical environment provides opportunity with barriers and human being modifies the condition with technology or adapts it. For example, human uses weather control mechanisms like air conditioners in urban areas and the use of fossil fuels to run vehicles or for power generation for comfort, which may have adverse consequences. Therefore, in view of the definition of Geography by Hartshorne, human geography may be defined as "Human Geography is concerned to provide accurate, orderly, rational and synthesized description and interpretation of the variable realities of ever active human beings and their activities/organisations over the changing earth surface and its environment."

You will study the man-environment relationship reflected in all the definitions of human geography in the Units 3 and 4 of this Block.

SAQ 1

What do you understand by human geography?

1.3 DEVELOPMENT OF HUMAN GEOGRAPHY

There have always been mentions or manifestations of man-environment interactions in various forms since the time immemorial. It is still continuing in a most primitive to an extremely sophisticated form. In terms of written record, Thales (624 BC to 547 BC) and Anaximander (611 BC to 546 BC) had mentioned the impacts of climate and vegetation on humans in 6th Century BC. Similarly, Hippocrates (460 BC to 377 BC) did the work of

comparison of the development of humans of two continents based on their physical associations. Aristotle said that the people of Asia are brave while the people of cold regions are not. It was recorded by many others like Herodotus (484 BC- 425 BC), Strabo (63 BC to 25 AD), etc. In India, the beginning of written descriptions may be traced back to the time of Kanishka (127 AD) and Harshvardhana (590–647 AD). Arabic scholars have also mentioned the human-environment relations in their descriptions of places and people. Human beings in the process of social evolution – from hunters, gatherers to pastoral herding to emergence of settled agriculture and urban-industrial societies have always been inquisitive about other places and people. When people travelled and traded merchandise, they kept some accounts and documents. When the king or the ruler collected taxes, some kind of maps was prepared by the State. Communities and groups of people sang songs about the changing weather conditions and their immediate neighbourhoods. All these conveyed the sense people made of their surroundings, both physical and human. However, the formal development of the discipline of human geography can be recorded from the age of explorations, when proper geographical documentation of people and places became more systematic, supported by more scientific maps and geographical societies.

Development of human geography may be seen in the following three stages:

a) Age of Cosmography and Exploration
b) Modern Period, and
c) Post-Modern Period

1.3.1 Age of Cosmography and Exploration

During the 15th C and Mid 18th C, there has been a significant expansion in the volume and quality of geographical knowledge. Much of these came due to discovery voyages and scientific expeditions of different parts of the unexplored world. It must be noted at this stage that such explorations were undertaken mostly by the west European countries as they knew little about the world beyond their immediate neighbours and shores. Chinese had undertaken such explorations much earlier both on land and water. The Greeks, Arabs and Persians travelled far and wide and kept records. The western shores of the Indian subcontinent and also the eastern flank of the peninsular India had contacts with Middle East and South-East Asia. However, European expeditions led to new developments in surveying, cartography and map-making including development of projections, etc. Maps were the essential needs for taking voyages and expeditions and also for exploiting resources for trade and expansion of power. The pioneering atlas 'Atlas of Bengal' (1799) by James Rennel has been a product of this period. During this period, scientific methods of plant and animal classification took place like that of Carolus Linnaeus, Lamarck and Count Buffon based on the descriptions documented by travellers, explorers and voyagers and also on own observations. That time the theory of evolution also germinated (1859). The environmental impacts on human behaviour was also observed and documented (Jean Bodin's work of 1566, Nathanael Carpenter's work in 1625 and Charles Louis Montesque's work in 1721 and 1750) on various parts/zones of the world with increasing exposure and knowledge to land and people across the world. Geographical writings on population and demography were also attempted (J.P. Susmith, 1741, Lambert Quetelet, 1848, and Edmund Halley, 1693).

This is the period when the transition from cosmography to scientific geography took place. Bernhard Varenius was the first person who identified two major sub-fields- regional and general geography. In his opinion, geography should study natural as well as human activities- both. However, the writings were more cosmographic and the systematic or scientific development of human geography started in late 18th Century.

1.3.2 Modern Period

The 18th Century is the beginning of scientific writings in geography based on the vast knowledge gathered from the voyages and explorations. Emmanuel Kant provided the philosophical base for placing geography as a scientific discipline in the classification of knowledge (Holt-Jensen, p. 41). Subsequently, Alexander Von Humboldt and Karl Ritter laid the foundation of geography as a scientific branch of knowledge. The period of Humboldt and Ritter is known as the classical period of modern geography. Because of their contributions to the field, geography came to be taught in universities, and Carl Ritter was appointed as the first professor of geography in Berlin in 1820. Gradually, the chairs of geography were opened in several universities of Europe. One of such chair professor was Paul Vidal de la Blache appointed in 1873.

The early geography was dominated by physical geography and the development of human geography was slow. However, it progressed side by side after the monumental initiatives of Humboldt and Ritter in the form of *Cosmos* and *Erdkunde* respectively describing the interrelationship between human beings and their physical environment. Earlier geography was concerned with the description and account of the regions in their physical characteristics and resources. Later, socio-cultural and economic aspects were also taken into account. Geography received good support during the phase for colonial expansion where geographical knowledge of new territories in terms of resources and human beings were considered to be very useful.

The works of Freidrich Ratzel in 1882 in the form of Anthropogeographie created a milestone in human geography recognising Ratzel as the father or founder of Modern Human Geography with wide publicity and acceptability in the academia. The Anthropogeographie is the synthesis of studies on human societies and physical environment and their relationships. Ratzel also contributed to human geography by his book Political Geography in 1897, which reflects environmental determinism, nationalism and racism. It was heavily influenced by the **Social Darwinism**, which justifies the racism and imperialism based on survival of fittest. It was carried forward by the disciple of Ratzel, Miss E.C. Semple, whose emphasis was very much on the impact of environment in shaping human and his/her activities. She was of the view that the role of human beings was passive in the relationship with environment taking a side of **Environmental Determinism**. Huntington also contributed human geography through his book 'The Principle of Human Geography' writing on environmental determinism highlighting climate primarily as the factor for

The term **Social Darwinism** coined by Herbert Spencer in late 19th C applying the Darwinian Theory of Evolution says that as the plants and animals have evolved from simple to complex ones over time and survived on their own strength, the human societies have also evolved the same way competing each other. It supports the idea of 'survival of fittest 'indicating the white Europeans at the top of all other societies justifying their power and command/rule over all others.
Determinism is an idea under which it is believed that human activities and responses are completely regulated by the natural environment.
Possibilism is antithesis of Deteminism, which advocates that humans have many opportunities amidst constraints posed by the natural environment. **Stop-and-Go Determinism** or **Neo-Determinism** says that humans should wisely utilise the opportunities provided by the nature with its control by watching, stopping and moving ahead but not against the nature.

shaping society, culture and history. As a reaction to the idea of environmental determinism, Paul Vidal de la Blache in his book entitled *"Principles de Geographie Humaine"* or Principles of Human Geography highlighted human's active role in the man-environment relationship. Blache began the idea of **Possibilism**, where human creates his/her own opportunities by modifying environment within the limitations set by nature. Subsequently, Griffith Taylor gave the idea of **Stop-and-Go Determinism** or **Neo-Determinism**, considering humans as active but having an approach to go ahead in tune with nature. Human agencies are perceived as traffic regulators, which can modify nature through technology but with limitations set by nature or watch the opportunities logically to move in the direction of nature safely. Many other early geographers contributed to human geography within above three approaches. The subsequent decades saw rise of the regional concept, and regional geography that presented a comprehensive account of different parts of the world at different scales taking the physical/environmental and human aspects together.

However, the framework of regional geography was soon criticised and quest for scientific approach in geography with extensive statistical data and development of statistical tools started and that gradually brought in objectivity, rationality and rigour. A number of models and theories based on scientific approaches like location and spacing of various activities, such as Central Place Theory by Walter Christaller, Industrial Location Theories by Walter Isard, Alfred Weber and August Losch, Migration Theories by Earnest G. Ravenstein, Everett Lee, Willburn Zelinsky, G.K. Zipf and Stauffer; size and spacing of cities by G.K. Zipf, transport network model by Edward Ullman, Diffusion Theory by Torsten Hagerstrand, and several models by Peter Haggett and Richard J. Chorley, followed rigorous scientific methods in geographical studies. Thus there have been some marked developments in human geography upto the World War II. It may be seen as a period of beginning of a new era of human geography, which has been amazingly fast after the World War II in terms of its growth, specialisations and approaches.

Till 1950s the pace of new developments in human geography was slow. Geography was primarily a study of areal differentiation or chorology. In reaction to this and environmental determinism, the other approach of geography started emerging in 1950s known as **Quantitative Revolution.** During this time, some geographers increasingly promoted the use of statistical techniques and mathematical models to explain and predict the causal relationships in geographical research as the regional geography was grossly lacking in these areas. You may define Quantitative Revolution as the extensive use of statistical techniques and mathematical models with the increasing help of computing machines like computers in geography. This changed conceptual, methodological and technological (intensive use of computing and graphic technology) approach transformed the nature and identity of human geography during this phase. In the late 1950s, the first attempt to revolutionise human geography took place along with some strong theoretical base. It was mixed of statistical/

mathematical models with strong spatial dimensions - location, distribution, hierarchy and interaction. Here interaction was most important due to spatial causal relationship of phenomena over the space. The rigorous use of mathematics and statistics in the analysis of causality and further modelling has been unimaginably progressing since 1950s even today. In this development, system approach emerged as methodological development (BJL Berry) to see things and phenomena in an interconnected system where these are spatially interrelated to each other and affect each other.

Geography was gradually becoming spatial science that received impetus from the debate after F.K. Schaefer's article published on exceptionalism in geography. Geography subsequently included the philosophy of science into the human geography rigorously, especially based on mathematical reasoning and statistical techniques for synthesis and analysis known as **Positivism** in Geography. This endogenous or in-situ transformation revolutionised the entire discipline across the world and sophisticated spatial statistical analysis was a major part of human geography with real world problem solving temperament. It involved well structured research with scientific approach having capabilities of explaining causal relationship in geographical research through testing of hypotheses.

During the flourishing time of Quantitative Revolution itself, a new wave of geographical thought came into existence in human geography as a reaction to excessive quantification and positivism. This wave of geographical thought is related to social and welfare geography to start with and radical geography particularly based on Marxist approach sometimes termed as Marxist Geography. The newly emerging sub-branches were Behavioural Geography, Social and Welfare Geography, Humanistic Geography and Radical Geography. The Quantitative Revolution and Positivism were thought to be less concerned with the problems of the society related to poverty, hunger, deprivation, malnutrition and health, crime, income distribution and inequality, deprivation in education, etc. It germinated from the social unrest and advocated for the study of equality and justice. It focused on the well-being of the people and gave less importance to the other approaches of geographical studies towards creating justice and equality in the society. It was focussed on the overall well-being rather than just economic growth. The pioneers of this movement are D.M. Smith (Human Geography: A Welfare Approach, 1977) and David Harvey (Social Justice and the City, 1973; The Limits to Capital, 1982).

1.3.3 Post-Modern Period

Since late 1980s, human geography started getting more exposed to the philosophy of science, social science and humanities. It started showing further more concerned about the ongoing socio-economic and political conditions across the world with new subject matters of geography like geopolitics, development and underdevelopment, inequality and social justice, health, education, gender, sex, subaltern, etc. in the core

background of physical environment, cultural landscape, space, place and scale. A number of specialised branch of human geography came and are still coming into being as distinct part of main trunk- human geography. The later developments in human geography during this period are Postmodern Geography and Postmodernism which come after modern period in terms of time but as a critique of modernity or western capitalist view. It is about looking at the world beyond grand narratives or modern (capitalist) lenses. Postmodern Geography started in later part of 1980s, which reasserts the importance of space and place in research. It was started by Michael Dear (1988), Edward Soja (1989), David Harvey (1989) and others later on.

SAQ 2

Describe the stages of evolution of human geography.

1.4 NATURE AND PERSPECTIVE

Nature

From definition, you have got some understanding about human geography and other aspects of it. The nature of human geography is interdisciplinary where it studies the spatial organisation of human responses to the physical setting or environment in terms of social, cultural, demographic, economic, and political activities over the earth surface and its environment. The Dictionary of Human Geography says that "Human Geography is a major field of geography that is centrally concerned with the ways in which place, space and environment are both the condition and in part the consequence of human activities" (Johnston, et al., p. 350).

Human beings are constantly active in the modification of their surroundings based on technological advancements within the limitations and opportunities provided by nature. Both nature and human beings are acting as per their nature and establishing equilibrium point for balance, which is relative and variable with time and space. Examples are innumerable like the varying adaptation and house structures by various inhabitants across the world. Good example of this at present is the earthquake resistant building structures around the world especially along the pacific ring due to the occurrences of earthquakes. Expansion of living areas in the sea in many countries of South East and East Asia and Middle East are also good examples. Still many different social and cultural practices are continued in this scientific era, which are significantly guided by nature. Similarly, economic activities of human beings and their spatial organisations are controlled and guided by nature despite rapid technological development. The interaction takes place by each other's adjustments. The changing social, cultural, economic and political landscapes are the focus of human geography but in the backdrop of changing physical/environmental landscape as cause and effect acted by both.

Thus the nature of human geography is that it studies the interactions of both- active human beings and unstable earth surface where physical environment has several limitations offering possibilities for opportunities to human beings, and in response human beings modify the natural environment and adjust within that environment. This relation keeps changing with the changing nature of physical environment and human progress.

Perspective

The dominant perspective of human geography is to study things and phenomena over the space as areal combinations in totality so as to develop a synthesizing discipline. As history is the narrative of time, geography is the account of space and place in their ever changing dimensions. It looks at multiple-dimensions of things and phenomena towards the exploration of reality in completeness by analyzing spatial associations among each other as these are causally and spatially interrelated to each other. For example, man's agricultural activities largely get their shapes by the physiography, climatic conditions, technological level, manpower, cultural practices and food habits, market, credit facility, etc. At the same time the agriculture also creates impact on landscape and environment. Some examples are land reclamation in Udhampur District of Uttarakhand, land reclamation in the ravines of Chambal area, *jhooming* cultivation, Ganganahar Command Area and such initiatives by people and governments impact environment. Technological innovations, development of genetically modified crops may enhance our income but they also leave deep scars on nature.

Human geography starts with the question 'what is where' (what is the location of something) or 'where is what' (what is there in a particular location/place) and attempts to find out why those things are located at given space of the earth and also how their existence is such or their distribution pattern is as they are. It explains not only what and where but also how things exist at present describing the processes involved in it holistically synthesizing all factors involved in it.

To understand the perspective of Human Geography, it is important to know the difference of Geography from other disciplines as it looks at things or phenomena wholistically unlike other disciplines. To sum up, geography attempts to organise its knowledge of the world into interconnected systems, in order that any particular fragment of knowledge may be related to all others that bear upon it" (Adhikari, p. 10).

SAQ 3

What are the nature and perspective of human geography?

1.5 SCOPE AND BRANCHES OF HUMAN GEOGRAPHY

Scope

The scope of human geography is mostly centred around the humans' activities related to social, cultural, economic and political spheres over the

earth surface in relation to environmental and physical conditions, that are varied and dynamically changing. It is not possible to develop the understanding of all facets of humans' socio-cultural, economic and political aspects as each one of these is huge and requires specialised attention. For example, economic aspects of human life include agriculture, livestock and allied activities, industry and services. Therefore, we need to take a look at multiple sub disciplines and branches within human geography that have developed over time. Many may have faded away and many new may still be in their infancy.

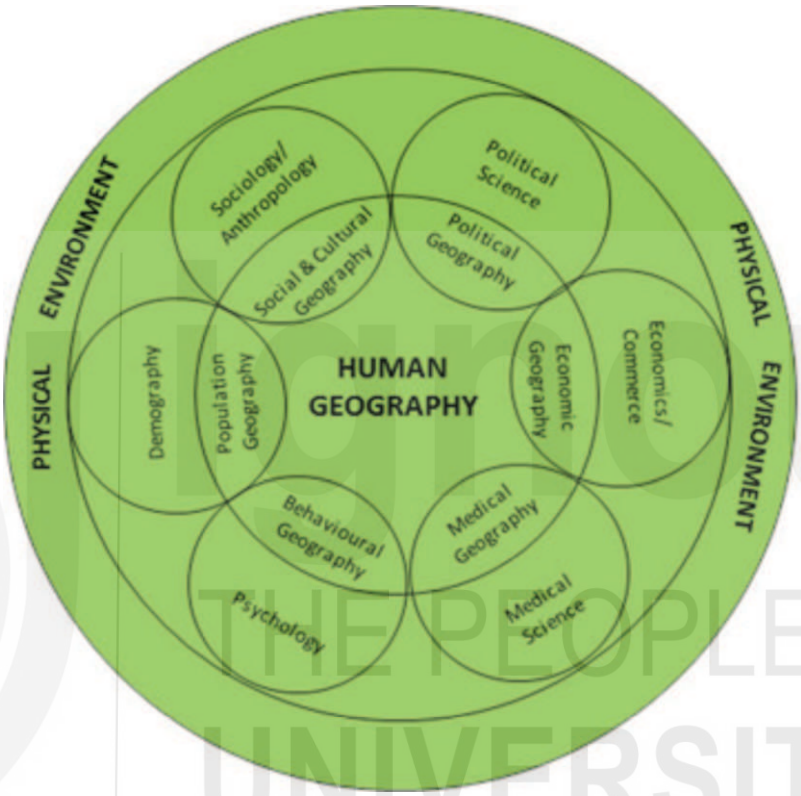


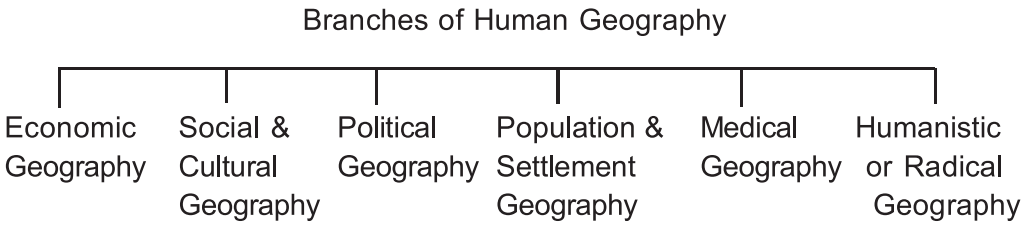
Chart 1: Scope of Human Geography.

Source: Drawn after Fenneman's Diagram (1919)

You may see in the above diagram that human geography borrows the subject matters from other disciplines (anthropology, sociology, economics and political sciences). Encircling these is the physical environment. Various combinations of human and physical environmental conditions can help in the understanding of the patterns and processes on the surface of the earth at varying scales- from micro to macro. Geography and history have overlapping areas of interest with other disciplines and liberally borrows subject matters, themes, issues and concepts from them.

Branches

As human geography focuses on the study of patterns and processes that shape the human beings with their activities over the earth surface in different environments, it covers many sub-branches of geography. These are social geography, cultural geography, economic geography, political geography, population geography, etc. The main branches of human geography are as given below:



There are a number of sub-branches within these major branches of human geography. It encompasses a large number of branches and, therefore, is wide and diverse. It includes the specialised branches of Economic Geography (resource geography, agricultural geography, industrial geography, geography of trade, transport and communication, geography of marketing, business/commercial geography, regional development and planning, etc.), Social & Cultural Geography (social geography, cultural geography, gender geography, etc.), Political Geography, (geopolitics, electoral geography, geography of federalism, etc.), Population and Settlement Geography (Population Geography, Settlement Geography, Urban Geography), Medical Geography/Geography of Health and Humanistic or Radical Geography. Many of these sub-branches are the combinations of more than one branch like regional development and planning is a blend of economic geography, social and cultural geography, population geography, political geography involving all tools and techniques (statistics and cartographic/geospatial) of regional/spatial studies.

SAQ 4

Mention the scope of human geography. What are the main branches of human geography?

1.6 RELEVANCE OF HUMAN GEOGRPAHY

Human geography is very relevant in the contemporary time. Despite micro-specialisation, it remained to be the only discipline having the capability of conducting wholistic study of real world by synthesizing various spheres of reality. The roles and relevance has increased due to increased real world problems associated with human beings over the space. To begin with the spatial aspects of contemporary societies and their characteristics, social problems, issues of regional disparities in economic development, regional development planning, exploding population and food security, local, regional and global conflicts, effects of global warming and climatic change on human society and social organisations, health problems, etc., require the domain of human geography.

Application of human geographical methods and perspectives may help find answers to many contemporary problems. For example, what are the problems faced due to global warming and climate change? Where are these problems located? What has been the process of impact upon human being and how this can be minimised or mitigated? Similarly, what are the health problems over certain region or whole globe, where are these problems found, how these problems have emerged, and how these problems can be tackled. These kinds of studies are done in human

geography involving all relevant aspects drawn from various associated disciplines to find the answers. It contributes to the exploration of knowledge also with emerging studies on the rapid changing world.

Therefore, in the contemporary times of increased local and global problems and issues, human geography has got immense relevance in contribution towards problem solution and knowledge exploration.

SAQ 5

What is the contemporary relevance of human geography?

1.7 SUMMARY

In this unit, you have studied:

- about human geography and its definitions, which says that it is the study of human beings and their activities over changing earth and environment.
- development of human geography which has travelled a long way from centuries before Christ to contemporary times.
- the nature and perspective of human geography, which are interdisciplinary and wholistic with great capability of synthesis.
- scope and branches of human geography where the scope is vast with a number of branches and sub-branches.
- relevance of human geography in the present day context.

1.8 TERMINAL QUESTIONS

1. What is human geography?
2. How has human geography evolved over time?
3. What are the nature and perspective of human geography?
4. What are the scopes and branches of human geography?
5. Explain the relevance of human geography.

1.9 ANSWERS

Self-Assessment Questions

1. Human geography is one of the two sub-disciplines of geography, which studies the human activities in the background of changing earth surface and its (physical) environment.
2. There may be three major stages of development of human geography- i) Age of Cosmography and Exploration, ii) Modern Period and iii) Post-Modern Period
3. The nature of human geography is interdisciplinary, which draws its subject matters from various other disciplines and integrates into

geographical framework for the study of whole reality. Its perspective is to see and examine things and phenomena in wholistic manner.

4. It has got wide scope with a large number of subject matters to study. The main branches of human geography are Economic Geography, Social and Cultural Geography, Population and Settlement Geography, Political Geography and Medical/Health Geography.

5. Human geography has got immense relevance for the exploration of emerging knowledge in the rapid changing world and also for providing solutions to various real world problems related to human beings associated with space.

Terminal Questions

1. You may start your answer with human geography as one of the two major sub-disciplines of geography. Thereafter define it and explain what human geography is. Refer to Section 1.1 and 1.2.

2. Discuss the evolution of human geography particularly focussing the age of cosmography and explorations, modern period and post-modern periods. Refer to Section 1.3.

3. Explain the nature of human geography as interdisciplinary and perspective of human geography as synthesizing discipline to study the reality wholistically. Refer to Section 1.4.

4. You may write the scope of human geography starting from human activities in relation to environmental and physical conditions through the diagramme based on Fenneman's early work. Thereafter discuss the major branches of human geography. Refer to Section 1.5.

5. Discuss the relevance of human geography in the context of increased local and global problems and issues like social problems, issues of regional disparities in economic development, regional development planning, exploding population and food security, local, regional and global conflicts, effects of global warming and climate change on human society and social organisations, health problems, etc. in the contemporary times, where human geography has got immense relevance in contribution towards problem solution and knowledge exploration. Refer to Section 1.6.

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UNIT 2

CONCEPTS IN HUMAN GEOGRAPHY

Structure

2.1 Introduction
Expected Learning Outcomes
2.2 Concepts in Human Geography
Scale
Time and Space
Area, Place and Region
Network
Spatial Interactions
Location and Spatial Distribution
Hierarchies and Spatial Organisation
Society and Culture
2.3 Summary
2.4 Terminal Questions
2.5 Answers
2.6 References and Further Reading

2.1 INTRODUCTION

In the previous Unit of this Block, you have studied about the definition, nature, scope and branches of human geography. We begin this Unit with an introduction to the meaning of the term 'geographical concept'. Subsequently, we define the meanings of some of the fundamental as well as derivative concepts of human geography.

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- define the meaning of geographical concept;
- explain the meanings of fundamental concepts of human geography; and
- explain the significance of concepts of human geography.

2.2 CONCEPTS IN HUMAN GEOGRAPHY

Concepts are important parts of a discipline as they give distinct identity to it. However, fundamental concepts of a discipline largely depend upon nature of **facts** studied in that

discipline and **perspectives** adopted to study those facts. Since different disciplines focus on different sets of facts and apply different perspectives, they have their own unique set of concepts.

How do we define concept? Preston E. James (1967) defines concept as a mental image of a thing or event. Its meaning closely resembles to those of facts and percept. He defines percept as the direct observation of a thing or event made by an individual through his senses. It other words, a percept is an empirical observation - an observation made through senses and based on experience. An empirical observation is sometimes called a **factual statement**. Fact refers to a single object, event, or individual. Unlike percept and facts, concepts represent those characteristics that are common to a group of experiences. They represent something common to several objects, events or individuals. One can understand difference between percept and concept by taking example of village. A direct and empirically verifiable observation of a single village is a percept of that village. In contrast, the mental image one forms of the village in general (i.e. characteristics common to all the villages) gives us the concept of village.

There are certain concepts, which are integral parts of human geography. They are useful in characterising its distinct nature. Hence, they are known as the **fundamental concepts** of human geography. The fundamental concepts of human geography are *time, space*, *location*, *spatial distribution*, *spatial interaction*, *spatial structure*, *hierarchy*, *spatial organisation*, *spatial and ecological perception*, *cognition* and *behaviour*, *culture*, *society*, *development* and *inequality*. Some of these concepts, such as space, spatial distribution, spatial interaction and spatial organisation are **indigenous concepts** of human geography. On the other hand, such concepts as time, society, culture, perception, behaviour, development and inequality are **derivative concepts.** These concepts have been derived from sister social science disciplines, such as history, sociology, anthropology, psychology, economics, etc.

SAQ 1

How is concept different from percept and fact?

2.2.1 Scale

Scale is primarily related to space in geography. According to D.R. Montello (2001), it carries at least three different connotations. In cartographic sense, it refers to the portrayed size of feature on a map relative to its actual size in the real world. Thus scale of a map is the ratio of a distance on the map to the corresponding distance on the ground. For example, one centimetre on a map may represent 25 kilometres on the ground. Second is analysis scale, which refers to the size of the areal unit at which some problem is analysed, such as the country, state or district levels. Phenomenal scale refers to the size at which geographical structures exist or over which geographical processes operate in the world. Phenomena

studied by geographers can be found at micro, meso or macro spatial level. It can also exist at local, regional or global level. For example, a dialect spoken by a community may be found at local level. On the other hand, a language can be found at regional level or global level.

2.2.2 Time and Space

Time and space are two fundamental realities of existence of anything on the earth's surface. The famous German philosopher, Immanuel Kant (1724-1804), was of the view that time and space fill up the entire circumference of human experience. Everything, including human beings, occurs in time and across the space. Both time and space are considered as everyday terms as we all encounter facts of time and space in our day-to-day lives. As a result, all of us possess commonsensical understanding of these terms. Despite that these concepts are difficult to define. Time is separation of two successive events. Space, on the other hand, is defined as separation between two places.

Table 2.1: Spatio-Temporal Dimensions of Reality

Parameters	History (Chronological)	Geography (Chorographic)	Historical Geography (Time/space)
Discipline	Chronology	Chorography	Choro-chronography
Dimension	Temporal	Spatial	Spatio-temporal
Focus of study	Period	Place	A place in a particular period
Dynamics	Change	Variation	Spatial variations of temporal changes
Investigation	Trend	Pattern	Changing pattern across time
Technique	Narration	Description	Narrative-description
Tool	Time line	Map	Changing Map

Traditionally, the concepts of time and space are used as the starting point of defining history and geography, respectively. In Table 2.1, the spatial and temporal aspects of a reality have been presented. History deals with time. Therefore, historians are concerned with temporal dimension of reality. They are mainly interested in studying the temporal evolution of society. But many of them often overlook the spatial and ecological realities of the earth in interpreting different types of changes. The truth, however, is that everything that has ever happened in human history has happened in specific places only. Geography, on the other hand, is concerned with space. Therefore, geographers are concerned with spatial dimensions of reality. They describe differences in character of places. They also describe similarities in the spatial distribution of phenomena. Since geography is defined as an 'areal' or 'spatial' science, therefore, some

geographers tend to ignore time in their study of the earth's surface. The reality, however, is that anything that is found anywhere on the earth's surface occur in specific time frame and change with time. Therefore, geographers can ill afford to ignore temporality in their study of the earth.

The interdependence of concepts of time and space only suggests the need for a closer cooperation between history and geography. The Greek historian, Herodotus (c. 485-428 B.C.), was of the view that: 'all history must be treated geographically and all geography must be treated historically'. Though space is the main concern of geographers, historians cannot afford to ignore this concept in their study of society. Similarly, human geographers cannot afford to ignore the time or temporal dimension in their study of the world. They study changes in the characteristics of the world across time.

SAQ 2

What is scale? Why time and space are important?

2.2.3 Area, Place and Region

The concepts area, place and regions have been developed by geographers to make sense of the world. The term area is generally defined as a part of space or earth's surface having definite extent. Although an important characteristic of an area is its extent, but it can be of any size (e.g. large area, medium size area or small area). It is a generic concept and, therefore, it does not have a definite location.

A place, on the other hand, is as an area of definite or indefinite boundary characterised by particularity and specificity in terms of its physical and cultural characteristics or functions. Physical characteristics of a place include such things as landforms, water bodies, soils, temperature, rainfall, wind, and animal and plant life, etc. Human characteristics include human settlements, factories and other buildings such as hospitals, schools, defence instalments, roads, railways, language, religion, etc.

A place is used in the sense of a specific spot on the earth's surface (ranging from dwelling to a village to city). It has defined absolute location (i.e. its exact place on the earth's surface), site and situation. It acquires its characteristics due to constant and dynamic interaction between physical and human elements over a long period of time. A place is also defined by the meaning people attach to it.

A region is a highly evolved concept. Regions are characterised by some sort of characteristic that unifies the area. Thus, unlike place, a region is defined as a homogenous area of considerable extent and size having specific location on the earth's surface. Region can be formal, functional, instituted or vernacular.

SAQ 3

What is the difference between area and region?

2.2.4 Network

Network is set of elements interconnected to each other – a set of linked nodes. A spatial network may be viewed as a network of spatial elements. Spatial elements are those, which are located or distributed elements on the earth's surface. Transport networks belong to the wider category of spatial networks. On the other hand, biological systems, social network, office organisations are examples of non-spatial networks. Geographers are especially interested in spatial networks.

A symbolic representation of a network and of its connectivity is referred to as graph. It is a set of nodes connected by links. Two most important elements of spatial networks are vertex (nodes) and edge (links). A node is a terminal point or intersection point of a graph. In transport network, examples of nodes are road intersection and transport terminal (station, terminuses, harbours and airports). An edge is a link between two nodes. In transport network, edges are the transport infrastructure supporting movements between nodes. An edge is characterised by direction.

Human geographers are interested in the study of the ways human's social, economic and cultural elements are organised and structured on the earth's surface. Examples of networks where nodes and edges are embedded in space are road network, railway networks, electricity network (power grids), mobile phone networks, social and contact networks, etc.

SAQ 4

What do you understand by network?

2.2.5 Spatial Interactions

Places on the earth's surface are not isolated from each other. People of one place develop connections with people of other places. Interaction takes place between villages, between villages and cities, between cities, and between port and hinterland. **The relationship of interdependence established between places due to movement of people, goods, services, money, information and ideas is called spatial interaction**.

The term spatial interaction was coined by Edward L. Ullman in 1954 to indicate interdependence between geographical areas. He considered this interdependence as complementary to the society-environment interdependence within a single area. He considered it as a major focus of geographic inquiry. The concept of spatial interaction is similar to the concept of 'the geography of circulation' which was popular in French geography in the first quarter of twentieth century. The term circulation refers to all kinds of movement. Edward Ullman has defined three basic factors affecting spatial interaction in terms of commodity flow between two regions. These are **complementarity** (relating to the character of areas), **transferability** (relating to character of commodities and cost of movement) and **intervening opportunities** (relating to the closer sources of supply or markets).

Complementarity relates to the character of areas. For interactions between two regions or places to take place, two conditions are necessary. First, there must be a demand in one place and that can be met from another place. Second, the place of demand must be able to pay for the supply so that a two way movements develop. These conditions make two places complementary, which is the basis of interaction.

Transferability relates to the character of the commodities. Interaction between complementary regions only will take place, and also if the product can be moved, which to some extent depends on the nature of commodity. The transferability of a product is largely determined by the costs of the movement. Movement of a product will take place only if the transport cost (i.e. the economic distance) is economical for the buyer. Transferability decreases as economic distance increases.

Intervening opportunities refers to the existence of closer sources of supply or markets. Interaction between complementary regions can take place only if there are no **intervening opportunities** for buyers and sellers to get what they require more easily. If there are closer sources of supply of a particular product then the buyer would tend to purchase from closer source. Similarly, if there is an alternative market centre close by then the producer would sell his products there instead of market located at distant places.

Earlier, interactions among geographical areas followed a **distance-decay law**, i.e. interaction diminishes with increasing distance and eventually disappears. However, innovations in the means of transport and communications have increased the level of interaction among geographical areas located far and wide. Because of this, patterns and processes of interactions in the contemporary world have become lot more complex. We refer to this process as globalisation, which is characterised by increasing easy and volume of movement and flow of people, ideas, information, goods, services, capital, etc. among different places on the earth's surface.

SAQ 5

What do you mean by spatial interaction?

2.2.6 Location and Spatial Distribution

Human geographers are concerned with describing and explaining the location and distribution of places and phenomena on the earth's surface. However, in order to properly understand the concepts of location and distribution as used in human geography, one should first understand the concepts of spatial, distribution, location, occurrence and magnitude. Gordon J. Fielding (1974) has differentiated between these concepts in the following words. The term spatial indicates an occurrence that occupies a portion of the earth's surface. Distributions are assemblages of occurrences related to each other. An occurrence is an identified phenomenon of a specific magnitude. A distribution is the arrangement of occurrences of the same type.

The positions of places, things, objects or events occupying the earth's surface can be observed and cartographically fixed. Thus, the term spatial location can be defined as 'where' of a place, a thing, an object or event on the earth's surface. The term spatial distribution, on the other hand, signifies distribution of places, things, objects or events of the same types that are spread out over the entire earth's surface or a part of it. Human geographers are concerned with the location and distribution of people, their houses, hospitals, factories, shops, roads, railways, waste dumping sites, etc. on the earth's surface.

There are three aspects of spatial distribution – density, dispersion (or concentration) and pattern. Density of a spatial distribution is the overall frequency of occurrence of a phenomenon within a given area, relative to the size of the area. Dispersion of a spatial distribution is the extent of the spread of a phenomenon relative to the size of the given area. Pattern of spatial distribution, on the other hand, refers to the geometric arrangement of a phenomenon without regard to the size of the area.

Spatial distribution patterns are of two types - random distribution pattern and non-random distribution pattern. A random distribution has no discernible order and where things or phenomena by chances. An example of random distribution would be the pattern of spacing of trees in a forest which is neither clustered nor uniform. Random distribution pattern reflects effects of more than one process. Non-random distributions exhibit arrangements that are unlikely to have occurred by chance. Non-random distribution patterns could be either uniform (systematic) or clustered or a combination of the two. The process or processes that give rise to such a pattern may be either distributed uniformly throughout a defined area or spatially concentrated in a part or a few parts of that area. In uniform patterns, occurrences are more regularly distributed than random pattern. For example, one can find the emergence of a uniform pattern of villages in a geographically homogeneous region such as alluvial plains.

In clustered distribution, occurrences are spatially more concentrated than would be expected in a random distribution pattern. Generally, a clustered pattern results if geographical occurrences benefit from close proximity. For example, in older cities of India, one often finds wholesale speciality shops, such as wood works, iron works, grain shops, etc., located in a close proximity with one another. They are locally known as *lakdi mandi (wood market)*, *loha mandi (iron market)* and *galla mandi (grain market)* respectively. Patterns of spatial distribution are governed by some underlying principles. The task of the human geographer is to identify those principles, which give rise to a particular pattern of spatial distribution.

SAQ 6

What is spatial distribution?

2.2.7 Hierarchies and Spatial Organisation

Hierarchy is the ranking or ordering of things on the bases of size, function or any other basis of importance. In spatial term, the world may be conceived as hierarchically organised entity in order of its size, functional importance or any other basis of geographical importance. The spatial hierarchy may be thought of as the rank or order of various places and things on the earth's surface. A very basic example would be the hierarchy of settlements in India. On the basis of population size, settlements in India range from the largest unit (i.e. metropolitan cities) to tiniest unit (i.e. hamlets). Similarly, the Census of India defines hierarchy of urban settlements on the basis of population size. Another example of spatial hierarchy could be regional hierarchy. A region occupies a fixed position in a hierarchy of regions of the same category. In this hierarchy, each successively higher rank region consists of aggregations of regions of the immediate lower rank. For example, the entire territory of India is constituted by 6 water resource regions. Each water resource region in turn is constituted by aggregating several basins (which constitute individual big rivers or a combination of smaller ones, which are contiguous to each other). A basin is constituted by aggregating several catchments (which pertain to main tributaries or a group of contiguous tributaries or individual streams), a catchment has several sub-catchments (which are mainly smaller tributaries and streams) and a sub-catchment may consist of several watersheds (which are the smallest sized hydrologic units in the macro level category). A watershed is constituted by sub-watersheds (in which main tributaries and streams are taken up for delineation of sub-watersheds), which in turn is constituted by many micro-watersheds (the smallest hydrological units).

The size of settlements often determines the level of interaction among them. Other things remaining equal, there would be higher degree of interaction among settlements of higher population size compared with settlements of lower population size. For example, Delhi and Mumbai are functionally more intimately related (as measured in terms of movement of people, goods, services, information, etc., between them) and are closer than Delhi is to Dehradun. This happens despite the fact that Mumbai and Delhi are more distantly located compared to Delhi and Dehradun. The concept of spatial hierarchy is often used in administration and development planning of a country. For example, for administrative purpose, the country is divided into states and districts. For development planning, the state is divided into a hierarchy of different spatial rank, i.e. districts, blocks and panchayats and revenue villages.

In order to understand the concept of spatial organisation, one needs to keep in mind the concepts of space, location, distribution, interaction and hierarchy discussed in previous sections. We know that human geography is concerned with human-made features and human activities on the earth's surface. Examples of human-made features are houses, hamlets and villages, towns and cities, roads, railways, parks, stadiums, industrial plants, tanks and dams, airports, etc. Examples of human activities include

spatial (e.g. movement), economic (e.g. agriculture, industry and services), political (e.g. participating in political process as a citizen) and cultural activities (e.g. learning and making of various cultural artefacts). **Human-made features and human activities are together known as (human) geographical phenomena.** Human geographers are concerned with the spatial appearance of these phenomena as expressed in their location, distribution and structure. The spatial analysis of these phenomena informs us that there are patterns and regularities on the earth's surface. For example, there are orders in the location and distribution of human phenomena on the earth's surface.

Similar to spatial distribution, some order and regularity are generally observed in patterns of interactions among places. We know that the level of interaction between places depends on their population size (as well as their functional importance) to a large extent and the physical distance between them. Therefore, we often find that the level of interaction between large size settlements is higher than between small size settlements. Similarly, closely situated places are generally closely related compared to the distantly situated settlements. Thus, one finds certain principles governing the patterns of spatial location, distribution and interaction. As a result, the spatial expressions of location and distribution of human activities, places and things on the earth's surface and interaction between places generally follow some orders.

Spatial organisation is concerned with the analysis of human behaviour in spatial environment. It refers to the way geographical space is organised - the spatial arrangements of people, human-created features, their activities and institutions and the linkages between places. Economic geographers, for example, study the spatial distribution of economic activities, such as manufacturing, agriculture, urbanisation, and transportation network, which links these activities together. Similarly, urban geographers are concerned with patterns of spatial distribution of urban centres of different sizes. The spatial organisation of urban settlements in India generally follows the following hierarchical pattern: *The larger cities are fewer in numbers and are widely spaced. As the size of urban centres decrease their numbers increase and average spacing (distance) among them decreases. In other words, compared to larger cities, the number of smaller cities and towns are many and the average spacing (distance) among them is lesser.*

The concerns of human geographers are not only limited to recognising and explaining the existing organisation of space and the inherent rationality behind their particular type of organisation. They are also concerned to question the existing organisation of space and propose suggestions for spatial re-organisation (i.e. regional planning). In the light of these, the students of human geography raise the following questions:

1. Where is it? (i.e. location and distribution)
2. Why is it so? (i.e. reasons for the existing patterns of location and distribution)

3. Is it just? (i.e. rationale for the existing organisation of space)
4. What ought to be? (i.e. pattern of an ideally organised space)
5. How to intervene and direct changes in order to achieve a predetermined goal (i.e. propose policy planning for the re-organisation location, distribution and interaction).

SAQ 7

What do you understand by spatial organisation?

2.2.8 Society and Culture

Society and culture are important derivative concepts of human geography. When more than one individual live together, some sorts of relationship develop between them as they interact among themselves. Society is defined as a network of relationships or interactions between people living together in an area. The nature of interactions among individuals could be social, economic, political or religious. For example, relation between a factory owner and the worker is an example of economic interaction. Further, the nature of interaction among individuals could be cooperative, harmonious, competitive, consensual and conflictual. Society is basically a web of such social relationships.

Society is a composite concept. It encompasses within it not only individuals but also various groups, communities, associations and institutions. The important institutions of society are social (marriage and kinship), political (e.g. the state), economic (e.g. factory), legal (e.g. court), educational (e.g. school), health (e.g. hospitals), etc. An individual can be member of any or many of these institutions. As members, they interact with their institutions. The relationship between citizen and the state is an example of political interaction. In these ways, society is constituted by various types of interactions.

Human beings inhabit in different geographical regions of the world. In each region, they not only interact with members and institutions of their society but also with their (natural) environment in complex ways. Because of diverse patterns of interactions in the society, different systems of production, means of livelihood and social relations emerge in different geographical environments. These are hunting, gathering, fishing, horticulture, floriculture, animal husbandry (rearing cattle), agriculture, industry and services.

An important concern of human geographers is to provide systematic accounts of differences among societies located in different geographical regions of the world. These societies are constituted by various patterns of people-people relations as well as people-environment relations. Human geographers divide human society into broadly simple homogeneous and complex heterogeneous on the bases of nature of social interactions and systems of production. Rural-tribal societies are

examples of simple homogeneous society. On the other hand, urban-industrial societies, because of complexity of systems of productions and division of labour, are included in the category of complex heterogeneous societies.

Let us now discuss about culture. First aspect of culture includes all human creations. Whatever humans have created since their origin on this earth are cultural objects. This aspect includes tools, technology, instruments, and techniques of hunting, agriculture, house building, cloth making and other practices. These are the material, objective and concrete aspect of cultures. Second aspect of culture includes human behaviour. Behaviour means humans' thought and emotions as well as their external actions. However, the behaviour of a particular individual cannot be considered as culture. It becomes a part of culture when majority members of the society share it.

In human geography, culture refers to the geographical aspects and expressions of material and non-material culture. Human geographers study the material and non-material aspects of culture in two different ways. First, they study the characteristics and evolution of culture in relation to geographical environment. Culture of a society is intimately related to geographical environment. The food habits, clothing, house types and life styles of people inhabiting desert environments are different from people inhabiting the mountainous or coastal areas. In the process of adapting themselves to the geographical environments or establishing harmony with their surroundings, human beings create and develop culture. Human geographers are concerned with how culture of a society has gradually evolved from pre-historic times to the present time in relation to geographical environment.

Secondly, human geographers study the diffusion of culture across space and time. The specific elements of culture which develop in particular places spread to other places. For example, Buddhism, Christianity and Islam originated in specific places. Over a period of time, these religions diffused to far off places. Similarly, languages and dialects, such as English, French, Spanish and Bhojpuri which historically originated in specific places are now spoken in many countries of the world.

Though human geographers apply concepts of society and culture to understand the social organisation of space, there are differences between them. Culture is often associated with anthropology and hence is studied mainly in cultural geography. The concept of society, on the other hand, has been taken from sociology and hence studied mostly in social geography. However, both social and cultural geographies are parts of human geography. Human geographers have traditionally had their closest links with anthropology (in the beginning human geography was known as anthropogeography) and hence with the cultural concept. But later on, they borrowed heavily from sociology. Consequently, concepts of society and social structure have become very important to understand the organisation of space.

SAQ 8

What are the differences between society and culture?

2.3 SUMMARY

In this unit you have studied:

- The meaning of the term geographical concept:
- Definitions of some of the important original as well as derivative concepts of human geography such as:
  - Scale
  - Time and space
  - Area, place and region
  - Network
  - Spatial interactions
  - Location and spatial distribution
  - Hierarchies and spatial organisation, and
  - Society and culture.

2.4 TERMINAL QUESTIONS

1. Explain concepts in human geography in detail.
2. Discuss scale, time and space in the context of human geography.
3. Write the distinction among area, place and region.
4. What do you understand by network? Discuss the importance of network in explaining spatial interaction with various factors of spatial interaction.
5. Explain the meaning of spatial interaction.
6. What is location? Discuss the concept of spatial distribution in detail.
7. Elaborate the concept of spatial hierarchy and spatial organisation studied in human geography.
8. What are society and culture? Highlight the importance of society and culture in the study of human geography.

2.5 ANSWERS

Self Assessment Questions

1. Fact refers to a single object, event or individual. Percept is a direct observation of a thing or event made through sensory organs. Concept, on the other hand, represents those characteristics, which are common to several events, objects or individuals.
2. The concept of scale is related to space. The scale of a map is the ratio of a distance on the map to the corresponding distance on the

ground. Time and space are two fundamental attributes of realities or existence of phenomena on the earth's surface. In other words, anything that is found anywhere on the earth's surface occur in specific time frame and change with time. Time provides temporal dimension of reality, and space on the other hand, gives the spatial dimension of reality.

3. The term area is generally defined as a part of space or earth's surface having definite extent of size while a place is defined as an area of definite or indefinite boundary characterised by particularity in terms of its physical and cultural characteristics or functions. A region, on the other hand, is a homogenous area of considerable extent and size having specific location on the earth's surface.

4. Network is set of elements interconnected to each other – a set of linked nodes or it is a system of interconnected lines/ arcs. A spatial network may be viewed as a network of spatial elements.

5. The concept of spatial interaction refers to movement of people, commodities, goods, services, money, information, ideas, etc. among places.

6. Spatial location tells the 'where' of a place, a thing, an object or event on the earth's surface. The concept of spatial distribution denotes distribution of places, things, objects or events of the same types that are spread out over the entire earth's surface or a part of it.

7. Spatial hierarchy refers to the ranking or ordering of geographical phenomena on the bases of their size, function, or any other basis of importance. The concept of spatial organisation, on the other hand, refers to the way geographical phenomena are organised in space i.e. the spatial arrangements of people, human-created features, their activities and institutions and the linkages between places.

8. The concept of society encompasses within it not only individuals but also various groups, communities, associations and institutions and web of interaction among them. Culture is only a part of society, which includes human behaviour and all their creations. An important characteristic of both society and culture is their spatiality. Both are variously distributed on the earth surface and relations among various societies and cultures are mediated by space.

Terminal Questions

1. Explain what is concept and how it is different from fact and percept followed by the brief of the major concepts in human geography. Refer to Section 2.2.

2. You can start your answer with the definition and types of scale in the context of human geography making difference between cartographic scale, analysis scale and phenomenal scale. Discuss the importance of time and space associated with reality. You may explain the spatio-temporal dimensions of reality. Refer to Section 2.2.1 and 2.2.2.

3. You may define area, place and region and explain the distinction with suitable examples. Refer to Section 2.2.3.
4. First, explain what is network and discuss the importance of network in explaining spatial interaction. Refer to Section 2.2.4 and 2.2.5.
5. Write the meaning of spatial interaction with various factors of spatial interaction like transferability, complementarily and intervening opportunities. Refer to Section 2.2.5.
6. Explain location first in terms of position on the earth's surface. You may then write about the spatial distribution patterns. Refer to Section 2.2.6.
7. You may start your answer with the definition of hierarchy with examples followed by the discussion on spatial organisation. Refer to Section 2.2.7.
8. Define society and culture first and explain the importance of these in the study of human geography. Refer to Section 2.2.8.

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UNIT 3

PERSPECTIVES ON HUMAN-ENVIRONMENT RELATIONSHIPS

Structure

3.1 Introduction
Expected Learning Outcomes
3.2 Approaches to the Study of Human Environment Relationship
3.3 Determinism as Human-Environment Interaction
3.4 Possibilism as Human-Environment Interaction
3.5 Neo-Determinism as Human-Environment Interaction
3.6 Human-Environment Adjustments
Geographical Factors in Organising Human Activities
Modifications of Environment
Human's Adaptation with Modifications in Environment
3.7 Equilibrium in Human-Environment Relations
3.8 Summary
3.9 Terminal Questions
3.10 Answers
3.11 References and Further Reading

3.1 INTRODUCTION

Human-Environment relationships are an integral part of the study of Human Geography. It examines human's relationship with the physical environment where humans live and work. Understanding the level of influence that humans and their physical environment share is also going to determine whether human is the dominant actor and can change his physical environment or if environment is the dominant actor and can dictate human's activities. The idea is that human and his physical environment are in constant interaction and, therefore, influence each other. The human environment relationship is a series of inter-relationships acting simultaneously and is highly complex in nature. In the previous units of this block, you have studied the definition, nature, scope and approaches of human geography along with the concepts in human geography. In this unit you will be studying the approaches to study the human-environment relationship, human-environment adjustments and equilibrium of adjustments.

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- recognise the idea of human environment relationship as a core idea within the fundamental concepts in geography;
- explain the different approaches to the study of human – environment relationships in terms of determinism, possibilism, probabilism and neo-determinism;
- explain geographical factors in organising human activities;
- describe human-environment adjustments; and
- discuss human-environment existence with equilibrium of adjustments.

3.2 APPROACHES TO THE STUDY OF HUMAN-ENVIRONMENT RELATIONSHIP

The discipline of Geography currently recognises four main approaches to the study of human-environment relationship:

1. Determinism, which puts forth the idea that the physical environment as an active agent determines all types of human activities,
2. Possibilism, which suggests that human beings have the freedom of choosing from possibilities within the set limits by nature,
3. Neo-Determinism, which suggests a middle path between the first two views stating that a compromise between human and his/her environment that would enable human to prosper, and
4. Human-Environment Adjustments, which show the various causes that influence the interactions of human and his environment.

Most studies of human-environment relationship fall under these above mentioned broad categories. There are other approaches in the present times such as the systems analysis or the interaction models of human-environment relationship but they also usually employ some aspects of the four main approaches.

The next sections talk of these approaches in detail.

SAQ 1

Think of the multiple ways in which human beings interact with their surrounding environment and list them.

3.3 DETERMINISM AS HUMAN-ENVIRONMENT INTERACTION

The concept of determinism as human-environment interaction is one of the oldest themes that have run throughout the history of geographic

ideas. **Determinism** is understood as simple causal relationships where the physical environment is an active agent and human is considered to be the passive agent. This means that the physical environment would dictate and mould all of human's activities, culture and society. The concept is also known as **Environmental Determinism**.

The idea that nature or physical environment is supreme and determines the course of human development, culture and society has existed for long. Amongst the ancient people such ideas were prevalent in relation to the places that were inhabited, like the cultures of those places as well as the appearances of the inhabitants of the particular places were influenced by the physical environmental elements of those areas. This is evident in the writings of Hippocrates, Aristotle and Strabo. Hippocrates was of the opinion that people of Asia were not so hard working as they lived in environmentally favourable conditions in contrast to the affluent Europeans who lived in harsher conditions and, therefore, were hard working. Aristotle in his work "Politics" made similar comments, and related traits like bravery and technical skills amongst different population groups to the regions or areas they lived in. He stated that the Europeans who lived in cold and difficult climates were brave and free people than other people who lived in warm Asiatic climates. They were lacking in technical skills and ability to think; thus they were not able to evolve in terms of political organisations. Whereas in contrast the Asians were thoughtful and skillful but lacked bravery enabling their societies to be easily conquered and enslaved. Aristotle further writes that the people who inhabited the Mediterranean regions especially the Greeks had the best of both the worlds as they lived in temperate climes and were brave, thoughtful and skilful. He proclaimed Greek superiority and their ability to rule over the other populations in this manner. In a similar manner Strabo also proclaims the idea of 'born to rule' for the Romans as the consequence of Italy's shape, relief, climate and space.

In the middle ages, religious ideas of different races and their characteristics were more prevalent. It was believed that the physical environment - the earliest creation of God - was not to be interfered with by human beings. Ibn Khaldun in the tenth century spoke of the differential nature of populations living in the warm and cold areas of the earth when he contrasted their behavior patterns. Onset of the Renaissance period witnessed an increase in the interest as well as travels to different areas of the earth's surface. Once again, the ancient ideas of how climates created different traits in humans resurfaced and became accepted as is evidenced in the writings of the Bodin and Montesquieu. The influential book called *The Spirit of Laws* (1748) written by Montesquieu gave a great fillip to the idea of importance of the environment, which moulds and shapes human's activity in the Renaissance period in Europe. This period also saw efforts to understand the variations that different climates created in different parts of the world amongst the human populations.

In the eighteenth and the nineteenth century known as the modern period of Geography, the concept of Determinism was revitalised. These were ideas concerning how the physical environment affects human populations, for example their growth, physical appearance and character traits. The questions and research regarding this relationship demonstrate that the scholars were trying to understand the variations of human behaviour and endeavour. Carl Ritter of Germany spoke about the human-environment relationship. Ritter's viewpoint was primarily anthropocentric and he did not provide any generalisation of the relationship. He was rather more interested in both sides of the said relationship: the impact of human on physical environment and of physical environment on humans. Yet, he also strongly advocated the idea that the physical appearance of a human being was dependent on his physical environment. Humboldt, who is known as the father of modern geography, was a firm proponent of idea of the physical environment of human impacting his activities.

The path breaking work of evolutionary biologist Charles Darwin, who purported that development of life forms, took place in selective action of natural forces seemed to confirm the position of human as a creature adapted to the environment. Following his work, Freidrich Ratzel in his book *Anthropogeographie* correlated the physical environment of the earth with the historical developments all over the world. All these ideas were being developed in the European continent and particularly in Germany. These concepts were spread into United States of America by Ratzel's student, the American scholar Ellen Churchill Semple, who took his ideas to United States of America and firmly established the concept in the study of geography. Semple's first major book *American History and its Geographic Conditions* (1903) had laid the foundations for the environmental deterministic ideas impacting the history of a region. Her most widely acclaimed book *Influences of Geographic Environment* (1911) begins with the statement that "Man is the product of the earth's surface", which shows her intense belief that it is the physical environment that actually governs all of human's actions on the surface of the earth. In other words, Semple says that nature dictates and directs human beings for their activities. Thus here natural or physical environment is the active factor and human beings are the passive factor in the human-nature relationship. Charles Darwin's work on the evolution was also adopted in the social sciences and is known as 'Social Darwinism'. The life cycle development propagated by Darwin was adopted majorly by W.M. Davis in his study of landform development whereby he postulated that similar to living organisms, physical features on the earth's surface also had developed through the process of geomorphic cycle. The basic concept of determinism says that the physical environment governs all and every of human's activities and life.

This concept has been used by Ellsworth Huntington and S. K. Markham in the recent times. Huntington writes on the impact of climate on civilizations. His ideas talk of the different races of human, who are governed in their behaviour by the climates, which they live in. This, he believes, has contributed to creating particular races that can then be divided on the basis of their racial traits, which are determined by or

created or affected by the environment they live in. This he assumes is a basic cause of why different civilizations are at conflict with each other. Thus both argue that in areas such as Western Europe, New England and Japan, which experience moderate to cool climates characterised by numerous cyclones and sudden weather changes have created an atmosphere, which inspires high levels of mental thinking amongst the populations and enable these nations to have leadership qualities.

All such writings points to the absolute governing role of the climate and the physical environment that human lives in along with the idea that it is the main reigning and affecting cause for all activities of his life.

The concept of Determinism was criticised by many other geographers. The basic assumption of Determinism is that comparable kinds of environments would produce similar results. For example, the intermediate climatic conditions of Greece and Italy that were said to have produced civilisations were not replicated in similar climates found in other continents of Australia, South Africa, Chile or California. Another important facet of the human-environment relationship not considered by the determinists is the impact that human has on the physical environment through his actions. This is an aspect that seems to have been completely missed by the determinists in their efforts to understand the human-environment relationship.

SAQ 2

What is Determinism?

3.4 POSSIBILISM AS HUMAN-ENVIRONMENT INTERACTION

Human beings have changed the features of the Earth's surface through the ages through their multifarious activities. In the early stages of civilization, human used fire to help his activities: from keeping the animals away at night to keep him safe to creating the primitive types of agriculture such as slash and burn methods of regenerating plant growth in different areas. Though hunting and agricultural methods and practices have changed over time, yet many of those primitive practices still continue in some selected parts of the world. Now technology and scientific developments have created newer methods of agriculture and hunting as an activity has become highly reduced in importance of human's activities. Both fire and hunting implements and techniques were the developments of technology by human in the far past ages. Today's technology involves creating cell phones and satellite communications and creating faster planes such as concords to save time taken for travelling and communicating. Technologies for exploration have also been developed for long journeys as in space exploration amongst a whole host of other technologies that we naturally use in our daily lives that bridges distances and spaces on the earth's surface. Thus with time, human beings have negotiated with many natural barriers and have succeeded in conquering the hurdles.

These are all improvisations of human to alter his surroundings in different manners so that whatever may be the climate, his activities are not restricted to what is allowed only by the physical environment he inhabits. Human beings have modified the natural environment that they inhabit for different purposes and created artificial environments that enable better living conditions. For example air conditioners, blowers and temperature control systems create an artificial environment within the enclosed spaces. Humans have made green houses and have their entire climate controlled environment so as to be able to produce the vegetation products of different climatic zones. These are some of the basic examples of how humans have altered their immediate physical environment to meet their needs and enable many of their activities. Yet, this overcoming of the natural environment is not a simple fact. This has entailed many efforts of human to adjust to his physical environment. Thus human has made choices from the available physical environment so that he/she is able to function at his/her optimum best.

The concept of **Possibilism** in geography states that the physical environment provides infinite opportunities or possibilities for human beings to choose to act upon. This view is usually associated with Vidal de la Blache of the French School of Human Geography. La Blache, a contemporary of Friedrich Ratzel was influenced by Ratzel's second volume of *Anthropogeographie* where he suggested that as the environment affects humans so does humans affect the environment in which they live while discussing the spatial dispersion of human on the earth's surface. Thus, humans have the capability to choose from a wide range of opportunities that the natural environment offers so that they may select the best option available to them to suit their needs and purposes. This work influenced a dialogue between Ratzel, Emile Durkheim and Vidal de La Blache. His position was the middle path of the two other above mentioned writers where he disagreed with Durkheim's idea of geography as only the social morphology stating that human participated in the game played by nature and that the physical environment was a "partner and not a slave of human activity". Simultaneously he also stayed away from the ideas of environmental determinism espoused by Ratzel as he says "nature is never more than the advisor" while agreeing with him that 'society could not be left hanging in the air.'

La Blache has been associated with the possibilist movement from its inception. His work brought out his belief that human has been free to organise his activities but within the realities existing as his physical environment, which creates a boundary for all his/her activities. Vidal de La Blache incorporated this idea in his work and suggested that human and nature are not enemies nor two opponents fighting rather human was 'part of living creation' and the environment was his/her partner in his/her effort to live his/her life. La Blache said that it is the physical environment that creates boundaries for human's activities, which are in turn dependent on the culture and psychology that he/she is a part of. This dialectic concept was also included in his ideas of *'genre de vie'* (distinctively different cultures and traditions) wherein he says that though similar environments

ought to give rise to similar responses from human but the observed differences in real life conditions are due to the different understandings of nature by human. He did not agree with the dichotomy of the natural and human aspects of geography as he believed that both are interrelated giving rise to unique landscapes that are landscapes in reality, which have been altered extensively by human's activities over time. The changes in the natural or physical landscapes will be greater in areas where human has developed culturally and technologically and his/her interference will have long lasting effects on the landscape. La Blache further espoused that it is the human community that has an integral connection with the natural environment and that one cannot be imagined without the other. Geography in his opinion is "the study of things associated in areas, mutually interacting, characterising particular segments of the earth space" (La Blache, 1913). These segments of the earth space are called 'pays' in his work. This was the beginning of the ideas of unity of human's activities and nature in any region in geography.

The historian Lucien Febvre supported the possibilist ideas of Vidal de la Blache when he said that 'there are not necessities but everywhere possibilities; human as master of these possibilities is the judge of their use' (Febvre 1932). His works became so influential that La Blache's original ideas got thoroughly hazy and imprecise and posed a problem for the rise of Geography as an independent discipline. Febvre's ideas of Geography as a natural or physical science meant that as similar laws governing different scientific phenomena were an integral part of physical sciences and similar laws were required to be formulated to become a part of the study of geography. This could happen only by the adoption of mathematical models such as probability analysis in geographical studies. The discipline of Geography was to be defined by the interrelationship between society and nature and it was considered that nature would then control the society that lived in it. These ideas were critiques by the philosophies of neo-determinism and the beginning of the quantitative revolution in geographical studies which led to the development of Geography as a spatial science.

The above mentioned debate on environmental determinism and possibilism showcase the two extremities of the opinion regarding human-environment interaction. There are multiple other views also that take up a middle position.

SAQ 3

What is Possibilism?

3.5 NEO-DETERMINISM AS HUMAN-ENVIRONMENT INTERACTION

The idea of **Neo-Determinism** states that though it is the physical environment, which determines human's activities, yet human can decide which of the activities to take part in. Human can thus wisely

choose his/her options available from his/her natural surroundings. This view is also known as **Stop-and-Go Determinism.** Griffith Taylor of Australia is one of the main proponents of this view. He believed that human wisely chooses the options from the surrounding physical environment. These are optimum options chosen and then exercised by human beings in any particular environment, which has the potential to be used as planning process that can be adopted by any nation to prosper. He believed that the goal of human's activities has to be according to the adjustment to nature's plan. According to Taylor, human has the ability to hasten, and go about in a measured manner or completely halt the advancement as human has the wisdom also to understand the signals given by the physical environment. In this case, humans can be compared to a 'traffic controller' who can change the rate without affecting the direction of advancement. The idea of Stop-and-Go Determinism comes from this concept.

Following the possibilistic views, Taylor also believed that not all environments will offer same kind of opportunities as there are harsh climates that will demand more effort from human than the moderate climates where nature may be more bountiful in its gifts to human and thus human has to do less work there. The ratio of the worth of effort and the value of return is the total payment human makes to the natural environment for allowing certain activities to be indulged in by human beings to earn his/her livelihood. Moreover, it is understood that human's activities are also to fulfill certain wants, which are priceless and thus no price is too large a price for human to pay to nature in such circumstances. As the environment endows human with several choices, nature also demands and collects a price from human. Therefore, human has to choose the preference to be accepted and has to be willing to pay the cost of that choice. An example cited by Taylor is the development of the barren plains of northern Denmark, where Danish farmers had used vast quantities of fertilizer to make the soil productive. He explained that those farmers had the choice available to them for making the land fertile and they utilised that choice, which nature offered them. They did this only because they would not be able to cultivate the less fertile lands. Thus human is only following the design set by nature and adjusting to the 'limits' set by it. He also advocated that most parts of the world had difficult climates like too dry, or too cold or too wet or too hot, which direct the activities of human. Human can change the circumstances through use of technology but cannot alter the basic physical environment and human thus has to accept the paths shown by nature for his/her activities.

Stop-and-Go Determinism is different from Environmental Determinism. The difference lies in the fact that the former brings in the concept of choice that is available to human in any sort of physical environment for conducting his activities, whereas the latter does not agree that human has choice in his physical environment, which is considered to be the ultimate

determinant of all his activities. Neo-Determinism thus advocates that if human chooses wisely according to the design set up by nature then his endeavours and activities will bear fruit.

The ideas of **Probabilism** have intimate parallels to the idea of Stop-and-Go Determinism advocated by Taylor. The probalistic view of human environment interrelations is that these are governed by contingency and probabilities of occurrence of events and phenomena. Spate is of the opinion that the idea of probabilism was like finding the middle ground between the two extremes of environmental determinism and radical possiblism. In his words 'not so much a matter of an all or nothing choice or compulsion but a balance of probabilities' (Spate 1957).

Probabilism states that natural environment may not always determine human activities. However, the natural environment has significant control, but humans have ability to manipulate the natural conditions to a large extent so that some of human activities are more probable than others within that natural environment. Probabilism views human's activities as a complex reaction to the interactions between natural environment and the technology being used by the social organisations located and functioning in those natural environments. It also emphasises the role of technology and its development phase in determining the probability of human activities that become a reality from the available choices or probabilities. Halford Mackinder was also a staunch supporter of this view as he said that the human geography would be based on the understanding of causalities effected upon the natural environment and that human would always have more inventiveness so as to tackle the difficulties set up by the natural environment. Many geographers utilised the probability calculus as well as the underlying philosophy in their studies of human environment interactions so much that the probability theory was considered to be an important part of the analysis conducted in geographical research. The probability theory and its applications in landscape study have provided a scientific system that could be applied across all discourses in Geography.

SAQ 4

What do you understand by Neo-Determinism and Probabilism?

3.6 HUMAN-ENVIRONMENT ADJUSTMENTS

The approaches to the study of human environment interactions discussed in the above sections show that the interactions are complex, multilayered and at times context specific. There is no one rule that fits all to perfection, rather there are multiplicities of responses that are all viable in their particular settings. Human – environment adaptations mean both physical (biological) and social (cultural) processes that enable human to adapt and thus to survive in any given natural environment or even in changing natural environments.

This process involves an interesting give and take, where humans make adjustments to the environment and the environment also accepts the activities that humans are doing. Harlan H. Barrows (1923) describes the discipline of Geography as 'the relationships existing between natural environments and the distribution and activities of human; which emphasises the human adjustments to the natural environments. He called these as human ecology stressing on the human-environment interrelationship characteristic of being communicative and adaptive, which in turn is influenced by the society that lives and works in that particular environment. There are many scholars who have worked on the factors responsible for the organisation of human activities in the realm of human geography. In the current context it is the processes, human attitudes and perceptions, that lead to reactions to the human-environment relationship, which are also considered significant contributors to the understandings of geographical factors in the organisation of human activities. Here some of the major geographic factors are discussed along with the modifications of the physical environment by human and finally discussing human's adaptations to modifications in the environment.

3.6.1 Geographical Factors in Organising Human Activities

The geographical factors in organising human activities can broadly be divided into three main factors: the physical factors, the economic factors and the human and social factors.

a. **Physical Factors:** These factors are those that are controlled by the natural environment such as climatic conditions encompassing temperature, precipitation, winds and location of the place, physiography, soil conditions and the prevalent natural vegetation. Climate is a basic factor that affects all human beings directly. Its impact on human's activities is many and varied. The advocates of the Environmental Determinism have always propagated climate as a major determinant of causing differences in human beings regarding their personal and character traits. Yet it is a difficult proposition to elaborate on a measuring scale as to how much it affects human activities and human behaviour. Research has shown a definite link between climatic conditions and human well-being. For example people with lung diseases are more liable to fall sick if they live in wet cilmates. For them a hot and dry climate is more suitable. Certain climates thus suit people suffering from particular diseases. The environment is proven to have an impact on the mental well-being of human beings as certain climates can create conditions of depression on people. However all people in the same climates do not suffer from the same diseases. Linkages have also been established between crime rates, suicides and the prevailing climatic conditions. The functioning of human beings influenced by climate is now a subject in medical sciences as well. Extremes of temperature and precipitation produce definite landscapes that enable human to

pursue only a few activities. Thus his/her choices are restricted. Moderate climates enable human to pursue a wide range of activities and can enlarge his/her basket of available choices. The location of a place is influenced by the prevailing winds as places located on the rain shadow areas do not receive rainfall but the rain fed areas receive a lot of rainfall. The intercontinental regions have windy climates where the wind direction will dictate the location of a settlement and its activities.

The physiography of a place can also ascertain the kind of activity that is practiced by humans living in that area. For example, humans living in hilly regions build houses of a different structure compared to the houses of a plain land or a plateau land. The physiographic characteristics of a region will determine many of human's economic as well as social activities.

Soil conditions are a result of the interaction of temperature, characteristics of basic rock and regolith present in the area, precipitation, winds and human activities. These controlling factors govern the soil regimes of any region. The natural soil conditions are almost unheard of today as most areas have been worked on by human and the first change to be noticed in the physical factors that govern the organisation of human activities is the soil. If the soil is fertile then there is good growth of crops with little efforts and if the soil is poor in nutrients then the effort put in by human is huge and often the output of that effort is not enough as even high quality and quantity of crops will not flourish in poor quality soil.

Natural vegetation in any region or area is an indication of the interaction of all the climatic factors and some biological factors prevailing there. For example, natural vegetation will also indicate what kind of plant and animal life will exist in the area, for example, elephants do not live in the desert regions as their food resources are scarce in that climatic conditions.

In another example it can be said that the modification of environmental conditions by human beings for example creation of irrigation systems in dryland areas help in creating and sustaining genetic modifications of same food grains (rice grown in West Bengal and Orissa and also in Punjab) in different climatic zones. These adaptations are towards the humid regions of the earth's surface. Human is dependent on nature for his basic food and resources that enable him/her to create civilizations and progress.

b. Economic Factors: The economic factors of organisation of human activities such as production regimes, labour force employment and the economic systems prevailing in the different societies show human's adaptations with environmental modifications. The productions regimes are controlled by dynamics between the production units, be it industrial or agricultural or tertiary in nature. All of these are also

dependent on the natural resource base of the region to a certain extent. These are forms of processes that govern the organisation of human activities. For example, mining will be carried out in regions, which have abundant natural mineral resources only. Sand mining will be carried out near the river beds and in the fields near the river bed as well as in the desert areas where ample quantities of sand is available. Similarly, large scale agricultural activities will only be possible in favourable climates for a particular crop. The prevailing economic system will determine the labour force availability and deployment. It will also determine the type of activity to follow in each individual economy.

c. **Human and Social Factors:** Human and social factors are at the core and are greatly responsible for organising human activities. The human and social factors in organising human activities are dependant to some extent on the natural environment. This is because man's behaviour is determined by the environment he lives in and his own understanding of that environment, which allows him to do activities. Most populations in the world in the first stages of civilisation were in the river valleys; even today the river valleys are some of the most densely inhabited regions globally. Yet, such areas are liable to flooding hazards and man lives with this knowledge in crafting his life there. The understanding man shows here is the fact of taking precautions against the flood hazard.

The use of technology helps man in creating such ameliorations against different kinds of hazards. Technological development also helps in creating better living and economic conditions. The Middle-Eastern nations of today such as the UAE, Dubai, Qatar and Bahrain have become rich in the world because of the development of oil extraction and refining technology along with an increased demand globally for petroleum fuel. Moreover, even the changing of a room temperature simply by heating or air conditions in use within the room or building has shown possibilities of man using his knowledge and effort to create a better life conditions.

Cultural landscape is also important as it enables individuals to come together and decide on their interaction process with the natural environment. Each community manages its own process of interaction with the natural environment. The tribal communities of Jharkhand worship the trees and plants and waters they hold sacred and protect those areas of the forest. No one from the community has the right to cut any part of that protected forest area. This is the process initiated by the community to create forest reserves as most of them are dependent on gathering forest produce for their livelihoods. Each community fine tunes its responses to the natural environment in its own distinctive and unique manner.

Over the time, both the human society and the natural environment adjust to each other and develop local to global linkages *(genres de vie)*. In effect they become a merged entity almost at one with each other. Society

develops and becomes industrialised from an agricultural base moving on to urbanisation dynamics between different places. This shows that the history of human development is intricately woven around the adjustments that the human beings and natural environment have made with each other.

This approach is termed as Landscape Chronology developed by Fochler-Hauke (1959) based on the studies of lost villages in medieval England (Beresford, 1951) and aerial photographs for showing ridge and furrow patterns (Mead, 1954). This idea is also an important aspect of Whittlesey's (1929) concept of sequent occupance.

3.6.2 Modifications of the Environment

As the environment has impacted human's activities so has human influenced the natural environment all over the earth's surface. In fact human has at places so changed the natural vegetation on the earth's surface that it is indeed difficult to name it as 'natural vegetaion' of that place as vegetation regimes of any place was the first environmental factor to be impacted by human's activities. There are two major processes through which human has modified the environment. The first of these is the one which has been discussed above in the creation of artificial environments that are completely human made in nature. The second of the processes involves working with the natural environment and using technology to help alter some facets. For example, land reclamation in the desert areas, swamps and ravines, etc., all are made possible in the same physical environment but with the help of some technology.

The ecumene (inhabited by human in Greek terminology) regions of the world has been expanded rapidly. Human migrations now have left hardly any part of the earth's surface undisturbed from the snow fields of Alaska in the north and Antarctica in the south almost every place is now under human's dominion. The phase of the migrations speeded up in the sixteenth and seventeenth centuries when the European continents witnessed massive migrations to parts of the 'new world'. Thereafter, this steady flow of human has continued till today in the era of globalisation where migration of skills is observable in all regions of the earth. Technology has aided the inhabitation of the hitherto uninhabitable areas for example the reclaimed lands under the Delta project in the Netherlands and the huge irrigation schemes undertaken by multipurpose dams and canals in different nations. Now mining is carried out in the depths of the oceans and tops of the mountains with the help of advanced technology, which has enabled the exploration of scarce minerals leading to almost permanent settlements on the high seas in the oil rigs and the mineral exploration camps.

There has also been an escalation in the utilisation of the environment to create enhanced productive capacities to satisfy the needs of human. There has been development of the High Yielding Varieties of crops in all regions and all categories of agricultural products. There has also been cultivation of particular food grains in non traditional regions that were

earlier not done. Similarly, animals have also been bred by crossing different strains to avail the best features of both the varieties. Industrial production has also increased to very high levels of production to satisfy the requirements of an ever growing population. Mining activities, demand for fuel, cost cutting labour processes to enable profits have also intensified and amplified leading to an almost crisis situations for the environment. This is visible in the current situation of global warming condition where the atmospheric temperature conditions have increased all over the world leading to climatic anomalies such as melting of glacier ice in certain area to extra high rainfall in other regions of the world. Immense pressures has been put on the environment caused by very high and rapid population growth along with concomitant increases in the aspirations of people and advancement of technology. Finally, human's perception and attitude towards the environment have also changed over time.

3.6.3 Human's Adaptation with Modifications in Environment

Human has till now largely treated the environment as a free good and has used it for his/her own advancement. For example, in the northern polar region, Eskimos have built houses of snow called igloos that shelter them. In other places, such as Middle Eastern world, higher economic growth creating conditions of higher affordability, advanced technology (Central air – conditioning systems) is utilised in creating comforts from the harsh desert climate. In some places now, the environment is responding to human's activities in a non-conducive manner for human progress. The change in the environment will create huge demands on human to adapt to a changed environment. Also, in terms of the evolutionary bias, human is the weakest of animals on the surface of the earth though with the most superior innovating, thinking and creative power. Therefore, as nature changes, human's adaptations to the modifications in the environment will be of more and more technology based. Human can adapt to the changes and modifications in the environment with help of advanced levels of technology. The current debates on climate change are an example of this process where human has recognised that the natural environment has been changed due to his/her own actions and that the remedy has to be in changed activities and enhancement of particular types of technologies.

SAQ 5

What do you understand by human-environment adjustment?

3.7 EQUILIBRIUM IN HUMAN-ENVIRONMENT RELATIONS

Human and his environment both need to rest at optimum positions in their interactions. Without reaching the equilibrium position of human-environment interaction, human will gain less from the benefits of the

environment. Life will become much more difficult for humans, if they do not heed the warning bell sounded by the environment. In the current era the world has witnessed the first impacts of global warming processes in the increased frequency of deadly cyclones, floods and earthquakes. For example, constructing large dams in fragile geological regions can create a pressure equilibrium problem and result in devastating earthquakes in the regions. This could also lead to damaging floods and structural damages to the dam site itself. Deforestation of large tracts of land for creating agricultural land can bring on larger floods in the region leading to disasters.

While the earth has previously already witnessed alternating warm and cold periods and currently we are in a warm period of the earth's geological and climatic history, yet what has changed is the rate of change of the climatic elements leading to increased levels of global warming in a very short span of time. This has happened due to very high levels of emissions of greenhouse gasses from over use of fossil fuels, refrigerating agent fumes etc., to create development and better living conditions for human beings. There is hope that with the onset of usage of green technologies, the harmful effects of practices of human activity on the environment would lessen creating a better environment for both the human beings and the physical environment to coexist on mutually beneficial or sustainable terms.

SAQ 6

What is equilibrium in human-environment relationships?

3.8 SUMMARY

In this unit you have studied:

- The approaches to the study of human-environment relationships.
- Environmental Determinism, Possibilism, Probabilism and Neo-Determinism or Stop-and-Go Determinism as human-environment interaction.
- Human-environment adjustments through modifications and adaption of environment.
- Geographical factors in organising human activities.
- Human-environment adjustments, where the balance of human-environment interaction or equilibrium position is required for the continuance and existence of human and environment together.

3.9 TERMINAL QUESTIONS

1. Discuss the concept of Environmental Determinism with suitable examples.
2. Elucidate the ideas of Possibilism.
3. What is Stop-and-Go Determinism? Is this a viable option in today's world?
4. Explain Probabilism in the present context.

5. Write about the factors that influence human- environment interactions.
6. What are the modifications and adaptations that human makes with the physical environment?

3.10 ANSWERS

Self-Assessment Questions

1. Human beings interact with their surrounding environment in multiple ways, where sometimes they go absolutely according to nature's direction, sometimes they modify the surrounding, sometimes there are certain modifications and certain adaptations, and sometimes there are interactions guided by suitable conditions like one gets in traffic light.
2. Determinism is one of the approaches to human-environment interactions, which advocates that nature is the active agent and humans are passive; nature dictates directions to human beings.
3. Possibilism is one of the approaches to human-environment interactions, which advocates that nature is the passive agent and humans are active; humans modify nature for their survival and nature remains passive.
4. Probabilism is the middle path of both ends- determinism and possibilism. It believes that though nature poses limitations, humans manipulate them for various activities.
5. This is a process of interaction between unresting earth and active human beings, where human adapts to the environment and the environment also adjusts to the activities being pursued by human.
6. Human and his environment both need to rest at optimum positions in their interactions. Human-environment adjustment means the balanced interactions between nature and humans. Nature acts different ways and humans modify certain aspects, adapt few and make a balance, which is a continuous process.

Terminal Questions

1. Discuss Environmental Determinism in the context of man-environment relationship where environment is supreme and controls the humans' activities. Cite some suitable examples in support of your answer. Refer to Section 3.3.
2. Discuss Possibilism in the context of man-environment relationship, where humans are active agents and modify environment for their activities with some suitable examples. Refer to Section 3.4.
3. Discuss Stop-and-Go Determinism in the context of man-environment relationship, where environment poses certain limitations and humans direct their activities accordingly. Thereafter you may critically write about the viability of this in the today's world. Refer to Section 3.5.

4. Explain Probabilism as the human-environment relationship where you may write how some human activities are more probable than others in certain environmental conditions. Refer to Section 3.5.
5. Discuss the physical and human (cultural) factors influencing human-environment relationships. Refer to Section 3.6.
6. Discuss the modifications and adaptations made by humans to maintain the balanced relationship with physical environment for sustainable existence. Refer to Section 3.7.

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UNIT 4

HUMAN ADAPTATION TO THE ENVIRONMENT

Structure

4.1 Introduction

Expected Learning Outcomes

4.2 Basics of Human Adaptation to Environment

4.3 Concept of Livelihood

4.4 Pre-Agrarian, Agrarian, and Industrial Modes of Activities

4.5 Human Adaptations in various Conditions

Cold Region- Eskimo

Hot Region – Pygmy, Bushman, Irulas and Bedouins

Plateau Region- Gonds and Maasai

Mountain Region- Gujjars and Nagas

Adaptation in Urban/Industrial Environment

4.6 Forms of Adaptation in Hazards

4.7 Summary

4.8 Terminal Questions

4.9 Answers

4.10 References and Further Reading

4.1 INTRODUCTION

We look at nature and find it beautiful and harmonious, but it also inspires fear in our minds. The green around us, the waves of the sea, the flowing water of the rivers make us feel happy. But, the flood, the fire in the forest, the storms across the world, etc. scare us to an extent that we have worshipped nature in different forms at different points of time. Then the question is what is nature or environment?

Nature is the whole of the physical world; it is also what exists outside of any human action. The environment has been defined in many different ways, from Einstein's definition ('everything that is not us') to that of the European Union: 'The whole set of elements which form the frameworks, the surroundings and the living conditions of man and society, as they are or as they are perceived'. Humans are in nature, but they act upon it, thereby emancipating themselves from it. They are part of nature and yet apart from the nature.

The human–nature relationship is the object of contradictory representations. There is, on the one hand, hyped nostalgia for the lost paradise and on the other a primitive fear of

natural forces and a consequent urge to dominate nature, which originated with the Renaissance in the western world. The primary question is that, who has had to fight it in order to survive the vagaries of nature and who has the capacity to dominate the nature? To answer this question you need to have a temporal and a spatial approach to environment and human adaptation as humans in different regions of the world have adapted to nature in different ways. In the previous unit, you have already studied human adaptation very briefly. This unit will attempt to make you understand the ways humans have adapted to environment in different ecological settings. There have been multiple types of regions and multiple types of adaptation methods over different points of time depending upon available and accessible technologies.

Our objective for this unit is to identify the nature and forms of human-nature association in different geographical settings across changing technologies through the history of human on the planet.

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- explain how humans have adapted in different environment across the earth;
- describe the changes in the nature of human adaptation since first human appearance on the earth to the contemporary times;
- explain the concept of livelihood; and
- describe the specific features of economy and livelihood of some of the primitive communities in different environment.

4.2 BASICS OF HUMAN ADAPTATION TO ENVIRONMENT

We all live in a particular environment. But the question you may ask is that what does environment refers to? Environment refers to something that surrounds us. You will also find that nature is synonymously used for environment. We find similar expression like man-environment relation or man-nature relationship. Though the term 'man' has been in use in geography for all human beings, the term human is more suitable at present context, as both men and women interact, adapt and modify the environment around. Human beings live within and depend on the environment for their survival. 'Environment' mainly consists of two parts; namely natural and artificial environment. Natural environment in its realm incorporates the nature of terrain (rugged, flat, undulating), the types of climate (the amount of rain, heat, the variability of these), the types of vegetations, its abundance or absence, the relative location and situation and so on that is anything but uniform on the surface of the earth. These kinds of variations have given rise to varying nature of human-environment relationships across the globe. For example, you can see people

dependent on the sea water, whereas some may not have ever seen the sea. You also can find group of people dependent on forest and forest products like the hunting gathering communities, while others living in the hot and cold desert are almost devoid of flora. Seeing this, scholars like, Ernest Hackle, Buckle, Hettner, Huntington, E. C. Sample and likes refer human as dependent on environment commonly known as Environmental Determinism later challenged by the French Geographers.

The human mind and technology have helped humans utilise their natural environment to convert it into a more intensive artificial environment. Humans have changed the course of nature since the earliest known time in different forms with varying intensity. We know from the prehistory that humans have had their impact on the earth surface even when the climate distribution was not as it is today. You can see few of such examples in the still available rock-painting like one in Narmada Valley at Bhimbedka near Bhopal in Madhya Pradesh or in the Valley of Son River in Mirzapur district of Uttar Pradesh. The people inhabiting in these regions were successful in devising tools that could kill animal for their food and also knew to paint their images on the then home of theirs. You can also see them singing and dancing around the fire in those prehistoric paintings. The advent of fire modified the fate of the earth for next thousands of years and human turned from dependent/adapter to a modifier and creator of cultural environment of different kinds. The advent continued with use of tools and process of domestication of animals and plants, which we today call as animal husbandry and agriculture and known as Neolithic Revolution in history books.

Understandably, development and changes in technology result in changes in the natural and artificial environment(s).

SAQ 1

What do you mean by human adaptation to environment? What makes human beings to adapt to different situation?

4.3 CONCEPT OF LIVELIHOOD

Do you know that the word livelihood has a dialogical meaning in current time? You would find it so interesting to know the two sets of meanings and the two sets of people who use them. The first set of people are the traditional geographers and their use of the term livelihood refers to the basic human adaptation methods in different climates like gathering food, hunting animals for food, domestication of animals that are not violently wild to humans, domestication of plants, which are non-poisonous and so on. The economist especially development economists are the other set of people engaged with the researches and writings on livelihood.

In contemporary literature including web-based literature, which could be taken as the second meaning of livelihood, are filled-up with the concept of livelihood with a significant portion of literature having focus on sustainable

livelihood in the era of changing climate and changing nature and structure of the state. Livelihood in this sense comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. In this sense the concept of livelihood become complex as it depends on the interplay of government, civil society, and the external and internal organisations that attempt to intervene/assist people whose livelihood is threatened, damaged or destroyed.

Here, you need to ask the question why the livelihood of some people are threatened and who damaged and destroyed the livelihood of such people. There are no direct answer and no direct culprit. We all are partially responsible for damaging the livelihood of certain people and the history of human progress in totality can be seen as responsible. The way we have developed, started agriculture, developed industries, constructed dams, used and abused forests - these have displaced people from their adapted practices of earning livelihood or making a living. The way we have destroyed the environment by polluting the river and pond ecosystem we have threatened the livelihood of people who are dependent on water based economy. The continuous destruction of forest has made forest dwellers vulnerable in making their living. There can be more such examples around you.

SAQ 2

What do you mean by livelihood?

4.4 PRE-AGRARIAN, AGRARIAN, AND INDUSTRIAL MODES OF ACTIVITIES

We know by now that the nature of the surface of the earth is different and so is the response of the human beings to the different natural processes and phenomena. However, the character of physical environment and the human reaction to it is not the only sufficient explanation to the difference in the modes of life that is prevailing on the surface of the earth today. The nature and effectiveness of human effort and the possibilities of transplanting modes of life and complex activities in different parts of the world are due to differentiated level of techniques evolved in different parts of the world and the varying level of accessibility to these techniques by different sets of people in the society.

You have studied before that different climatic types result in different sets of human-nature relationships. Do you know that within the same climatic region difference in techniques may destroy the basic uniformity of nature's influence? For example certain group of people domesticated animals and moved from one location to other along with the domesticated animals. There were others who started sedentary life with identifying plants they could cultivate and survive on the output of the cultivation. This leads to

the generation of surplus because agricultural output could be stored for the year and further with expansion in the territory the amount of surplus could increase. The surplus gave rise to trade between communities. For example, pastoral community could offer animal product in lieu of food-grain or communities living in forest could bargain rice/wheat/coarse grain in lieu of forest product like wood or honey to name a few. Later the surplus and with new technology made human to develop a non-agricultural community- the city dwellers who could do things other than agriculture and animal rearing because there were surplus. These are the communities who evolved industrial mode of economy.

In contemporary times, the urban based industrial society is the key to development and of nation building. Human population has become more dependent on products from the industry even in the rural areas, where industries are not operating rather than product from the human skill and nature. Even the basic needs of the population in villages including mountainous and other remote regions are now dependent on products from industries like clothing and building materials. Nevertheless, the trajectory of human history indicates that humans are not born as clock abiding mechanical and managerial experts. Prior to the Industrial Revolution of 18th century the developed humans constitute part of agrarian society.

Agrarian societies were typically large in size and engaged in agricultural activities. They used to produce crop suitable to local environmental conditions, like in the humid climate paddy was produced and that gave rise to what we know as 'rice eating civilization' living across tropics of the world. Similarly, the people in the temperate regions started growing corn, barley and wheat. People in dry region became dependent on cultivation of coarse grains like ragi/madua, jawar, bajra, and so on. With mechanisation of agriculture and surplus production, internal redistribution and external trade began and tended to reduce the society-wide impact of local environmental differences. Agriculture popularly known as Neolithic Revolution began about 10,000 years ago only. Human prior to that was primarily dependent on products from nature directly.

The pre-agrarian humans were the categories as hunters and gatherers. They initially lived on locally available fruits, leaves, roots, etc., which are now known as 'minor forest products'. Later, once the first rudimentary tools were made (during stone age) some communities started hunting animals and in the process also started domesticating these animals giving rise to what we know today as pastoral activities.

SAQ 3

What are pre-agrarian, agrarian and industrial modes of activities?

4.5 HUMAN ADAPTATIONS IN VARIOUS CONDITIONS

Humans have lived in different conditions on the earth since their evolution. As you know that there are large scale variations on the surface of the earth in terms of terrain type, altitude, availability of heat, amount of precipitation and so on. You also know by now that human beings are living in almost all parts of the world except the few patches on the planet. They have inhabited the extremely cold conditions of Polar Regions and are also living in the hot deserts of the world despite extreme temperature regimes and scarcity of water. Different communities have adapted the natural conditions and have developed varying practices of livelihood with certain modifications for themselves for centuries. In this section of the unit we are taking examples of human habitation process in different climatic conditions from different parts of the world for you to identify the basic features of each of the adaptation processes.

4.5.1 Cold Region: Eskimo

Eskimo

We are sure that you are acquinted with this word 'Eskimos' in your General Knowledge class or a class quiz in your school days. Do you still remember where they live, what they do and how do they survive?

The Eskimos form the extreme outpost towards the infinite stillness of the regions of ice, and the last leg humans have forced northward are of Eskimos. Eskimos constitute the chief element in the indigenous population of the Arctic and Subarctic regions of Greenland, Canada, the United States, and far eastern Russia (Siberia). The Eskimos belong to the coast and the sea. They dwell by the sea and they are dependent on sea for their subsistence. Eskimos are distinctive in terms of their use of dog sledges. They remain in their skin-canoes in summer and in their dog-sledges when it is ice-bound in winter.

You know, even in the extreme cold Polar weather conditions and a very small population, Eskimos are not a homogeneous community. They are assemblage of many groups. The mutual resemblance of the different tribes of Eskimos is striking, though in totality their difference from all other races in features, figures, implements and weapons, and general manner of life are equally distinctive.

An Eskimo closely resembles a Greenlander. Their languages too have similarities. Captain Adrian Jacobsen shared his experience about some similarities in languages after travelling to both Greenland and Alaska. Eskimos resemble the races of the Asiatic Polar Regions, though their features and language have similarity with that of Greenlanders. The Eskimos are at present spread over the whole west coast of Greenland, right from Smith's Sound to Cape Farewell.

Eskimos have totally adapted their life to extremely cold, snow and icebound environment where due to scarcity of trees and almost non-existence of vegetable foods, animals and fish products mainly from caribou, seal, walrus, whale and other fish constitute their food. Harpoons are used by them to hunt seals, umiaks (larger boats) are used to hunt whales; and bows and arrows are used to hunt caribou and other animals during summer. Dog driven sledges have been the basic means of transport on land.

Caribou furs are used for clothing as they provide protection against the extreme cold. During winter, Eskimos generally use two types of houses to live- i) Igloos made up of snow blocks and ii) semi sub-terranean houses made up of stone or sod over wooden or whalebone framework. It is common to find Eskimos living in animal-skin tents during summer.

With growing interaction with people of south, Eskimos' life has changed substantially. Motorised vehicles have replaced dogs for land transport, and rifles have replaced harpoons for hunting purposes. With increase in the use of manufactured items, money that has been absent in Eskimos' society, is gradually becoming imminent. Of late, it is noticed that Eskimos have abandoned nomadic hunting and now live in northern small towns, often working in mines and oil fields. Others, particularly in Canada, have formed cooperatives to market their handicrafts, fish catches, and tourism ventures.

SAQ 4

Where do Eskimos live? How do they earn their livelihood?

4.5.2 Hot Region – Pygmy, Bushman, Irulas and Bedouins

Pygmy

Pygmy as a word is associated with a group of humans who have limited height or to say they grow upto 59 inches (150 cm) in average height. The best-known Pygmy groups and those to whom the term is most commonly applied are the Pygmies of tropical Africa (Kongo Basin). Though, in Africa only, some of the San (Bushmen) of the Kalahari are also of Pygmy size.

Pygmy peoples are in most cases hunters and gatherers, practicing neither agriculture nor cattle rearing. The transition from hunting and gathering to farming involved a major cultural innovation that has spread rapidly over most of the globe in the last ten millennia. In sub-Saharan Africa, hunter–gatherers have begun to shift toward an agriculture-based lifestyle over the last 5,000 years. Only a few populations still base their mode of subsistence on hunting and gathering. The Pygmies are considered to be the largest group of mobile hunters–gatherers of Africa. They dwell in

equatorial rainforests and are characterised by their short mean stature. Mostly they maintain close symbiotic relations with other groups in their region; consequently most have lost their indigenous languages and adopted that of their neighbours. Bamuti, one of the earliest group of Pygmys lives in Ituri forest region of Congo. Another group of Pygmys known as Twa (Batwa) live in the high mountains and plains around lake Kivu, in Congo, Rwanda and Burundi. Over the period of time, they have developed a trade with pastoral Tutsi community and agricultural Hutu community. Pygmys are primarily hunters, but some of them make pottery, which they sell to these communities and some have also developed the art of music and have become 'court musician'.

Bushman

The 'Bushmen' are considered to be the oldest inhabitants of southern Africa, where they have been living since at least 20,000 years. Their home spread over vast expanse of the Kalahari Desert. The Bushmen are Africa's oldest cultural group considered the closest surviving people to the original Negroid people of Africa. Bushmen are similar to Pygmy people in stature generally small height with light yellowish skin, which wrinkles very early in life. The term "San" was historically applied to Bushmen by their ethnic relatives and historic rivals, the *Khoikhoi*.

Bushmen were hunters and gatherers. About 70 to 80 per cent of their diet come from plant food (berries, nuts, roots and melons). These are primarily gathered by the women. The remaining part of their diet consists of meat (mostly antelopes), hunted by men-folk using poisoned arrows. They make their own temporary houses from gathered wood. Their hunting and gathering economy and social structure had remained virtually unchanged.

Neither the Bushmen cultivate nor do they keep livestock having no concept of the ownership of land or animal. These people remain on move with the change in seasonal pattern of rain and during dry season they congregate near permanent waterholes. The practice is known as transhumance. Early spring is the hardest season: a hot dry period following the cool, dry winter. Most plants remain dead or dormant, and supplies of autumn nuts get exhausted. Meat becomes particularly important in the dry months when wildlife can not range far from the receding waters.

Apart from fruit, berries, tubers, bush onions, and other plant materials, eggs of ostriches are gathered, and the empty shells are used as water containers. Alongwith plants, insects are also sources of food in terms of animal protein during dry season. Depending on geographical location, the Bushmen consume 18 to 104 species including grasshoppers, beetles, caterpillars, moths, butterflies and termites. Since 1990, with state intervention, some people of the community are beginning to have sedentary life and are engaged in agriculture.

Irulas

Irulas have been classified under Negrito ethnic group in the Anthropological literature. Irulas in Nilgiris have adopted the local regional languages- Tamil and Malayalam depending on their locations, unlike other such tribes found in Andman and Nicobar Islands who have still retained their languages. Irula people are generally called as Negrito people, they have a different hair consistency to other Tamil people. Their hair is more like a coarse Afro than the straight hair of others in Southern India. Irulas, an aboriginal community, is identified as one of the Scheduled Tribes of India. Irulas are present in various parts of India, but are primarily located in Tamilnadu followed by Kerala with a population of 189661 and 23721 respectively in the year 2011 (Census of India). Karnataka has 703 persons in the same year. Though they are spread in all the districts of Tamilnadu, 97 per cent of them reside in the districts of Thiruvallur, Kancheepuram, Tiruvannamalai, Vellore, Viluppuram, Krishnagiri, Coimbatore, Ariyalur, The Nilgiris, Cuddalore and Dharmapuri. In Kerala, 98 per cent of the total Irula population resides in Palakkad district only.

Their main occupations are catching snakes and rats alongwith fishing. They also work as agricultural labour and also as wage labours in the rice mills. Rats play a major role in destroying grains in Tamilnadu. To prevent rats the Irulas use their traditional earthen pot fumigation method for blowing smoke into the rat holes. It leads to severe health problems to them related to respiratory systems and heart.

Bedouins

Bedouins are known to inhabit the Arabian desert from Persian Gulf to the Atlantic Ocean and from present day Yaman to the borders of Turkey. Etymologically, the word Bedouins comes from the word 'Bedou,' which means desert dwellers. They have usually been involved in animal rearing and migrate seasonally depending upon the grazing conditions.

Herding of sheep, goats and camels has been the primary livelihood of Bedouins for meat, milk products and wool. Meat is usually consumed during special occasions like feasts, weddings or visits of guests because meat cannot be stored for longer period. Limited amounts of meat were made into hamit. Hamit is a kind of traditional method of meat preservation in which meat is cooked and then sealed in mutton fat at a ratio of 1:2. Hamit could be kept in usable condition for extended periods and is used as a source of fat, flavouring and meat for cooking. Bedouins families also raise chickens as a source of eggs rather than of meat. They also capture and consume wild birds and fowl, particularly during the planting and harvesting seasons.

Milk and milk products constitute a large portion of the traditional Bedouin diet. They preserve milk in different forms and common products are rayib, fresh butter semneh, leben, jameed and afiq. Rayib (common 'fresh makkhan' or yoghurt with butterfat) is churned by hand to separate the butterfat from the milk. The fresh butter is made into semneh (ghee or clarified butter) by boiling the fresh butter to separate it from the milk solids. It then becomes suitable for long-term storage and use. Leben

(common mathha, yoghurt without butterfat) is very important in the traditional Bedouin diet although it is highly perishable. They also produce Jameed from excess leben by reducing the moisture content, which can be equated with a soft white cheese which these people use to eat with olive oil.

SAQ 5

Mention/delineate the regions of Pygmy, Bushman and Irulas.

4.5.3 Plateau Region-Gonds and Masai

Gonds

The Gonds, the largest Scheduled Tribe community in India, are linguistically Dravidian. We have adequate evidence to suggest that the Gond people have been living in the subcontinent much before the arrival of the Aryans. No wonder, a large landmass of the subcontinent is referred to as Gondwana! The word Gond comes from *Kond*, which means green mountains in the Dravidian idiom. They are also known as Koiture. Because of their population strength, they are known as the "face of Indian tribes". The Gonds are spread over large parts of central and southern India. Chhindwara district of Madhya Pradesh, Bastar district of Chhattisgarh, parts of Maharashtra, Andhra Pradesh, Orissa, Bihar and Jharkhand are some of the important places of inhabitation of these tribes. In Madhya Pradesh, they inhabited the dense forests of the Vindhyas, Satpura and Mandla in the Narmada region of the Amarkantak range.

Gonds are often considered as warrior tribes. They are known to have a distinct identity in terms of culture, language and costumes. Gonds gained control of Malwa region after the decline of Mughals and Marathas and are also known for their heroics in the battle against British.

Owing to their vast geographical spread, there is no cultural uniformity among the Gonds. The most developed are the Raj Gond, who once had an elaborate feudal order. Aside from the fortified seats of the rajas (kings), settlements were formerly of little permanence; cultivation, even though practiced with plows and oxen, involved frequent shifting of fields and clearing of new tracts of forest land. The Raj Gonds place themselves outside the Hindu caste system, and refuse to accede to the superiority of Brahmans. They are not bound by Hindu rules either.

There are three important categories among Gond tribes in Bastar - the Muria, the Bison Horn Maria, and the Hill Maria. The forth category is Abujhmaria who are the most primitive among all and inhabit the rugged Abujhmar Hills. Their traditional type of agriculture is slash-and-burn (*jhum*) cultivation on hill slopes; hoes and digging sticks are still more prevalent than plows. The villages are periodically moved, and the commonly owned land of each clan contains several village sites occupied in rotation over

the years. The name Bison Horn Maria comes from their dance headdresses. They live in less hilly terrain and have more permanent fields, which they cultivate with plows and bullocks. The Murias are specifically known for their youth dormitories, or *ghotul,* in the framework of which the unmarried boys and girls lead a highly organised social life and they receive training in civic duties and in married life.

Maasai

Maasais, also spelled as Masais, are nomadic pastoral community of East Africa. Maasai is a linguistic term for the speakers of Eastern Sudanic language called Maa. Maasais are found along the Great Rift Valley of Kenya and Tanzania, the Samburu of Kenya, and the semi-pastoral Arusha and Baraguyu (or Kwafi) of Tanzania.

The Maasais are thought of as the typical cattle herders of Africa, yet they have not always been herders. Shortage of land owing to population growth has resulted in declining cattle rearing. However, cattle still represent 'the breath of life' for many Maasais. They give top priority to herding above all other means of livelihoods. Maasais look like red hair smeared with ochre (a pigment). These Maasais carry spears. In recent decades, Maasai cattle herders have also started growing maize (corn) or wheat, rearing Guinea fowl and raising ostriches. A few of them are also being hired by ecologists to take pictures of the countryside or are placed in the organised market spaces with their dance performances and ethnic craft display and sale, like in Nairobi Maasai Market.

The pastoral Maasais are fully nomadic and wander in bands throughout the year. They completely depend on the meat, blood, and milk of their herds for their subsistence. They remain in the drier savannas of the rift valley during wet season and migrate to perennial meadows of the higher plateaus during long drought. They live in hamlets known as Kraal consisting of few families with their herds having a cluster of mud-dung houses in circular form enclosed by thorn bush fence. Polygyny is common among older men and first two wives get share of herd, while later wives (third, fourth and so on) get animals from the senior wives. Marriage involves a substantial bride-price in terms of livestock.

The Massai society is egalitarian. They are grouped into two classes or moietees having number of patrilineal clans. The system of age-sets is the basic institution of their social integration, where the age-class gets formed as permanent grouping based on the groupings of the same age that are initiated into adult life during same open-initiation period. They have the system of hierarchy of grades, where they move up crossing the levels of junior warriors, senior warriors, junior elders and senior elders at the top. The senior elders are authorised to take decisions for the community. This process of grading and upward movement involves approximately 15 years.

The Massais of 14-30 years of age group are known as morans. During this period they spend isolated lives and learn customs alongwith developing strength, courage and endurance.

SAQ 6

What are the primary and subsidiary means of livelihood for Maasais? How do Maasais regulate their life through 'age-sets'?

4.5.4 Mountain Region – Gujjars and Nagas

Gujjars

Gujjar or Gurjar is an ethnic group with populations geographically spread in the Himalayas and find their habitats in India and Pakistan. Small number of Gujjars is also found in north eastern Afghanistan. Though nothing can be said with certainty about the origin and rise of the *Guijars*, it is evident from various theories and hypotheses that they are aboriginals located in India. They are believed to be the descendants of the ancient *Yuchis* or *Kushans*. During 7th century, a devastating drought occurred in Rajasthan and Gujarat and some of the *Gujjars* migrated to the Shiwalik hills spreading over outer Himachal Pradesh, Uttar Pradesh, Haryana and other Himalayan areas. The noted explorer, Cunningham, accounts their presence in every part of the north western India from the Indus to Ganges and from Hazara mountains to the peninsular Gujarat. Numerically, they are the third largest ethnic group in Jammu and Kashmir. They are not found in Ladakh but some of them migrate along with their flocks of sheep, goat and cattle to Dras area of Ladakh. Gujjars are in both the major religions of India viz. Hindus and Muslims.

In Jammu and Kashmir and parts of Himachal Pradesh, they are categorised as Scheduled Tribe under positive action schemes of Indian state. Gujjars are largely a pastoral community. They have been practicing seasonal migration and the range of migration is from Gujarat to Higher Himalayas. During summer, with melting snow and greening of Buggyals they go to upper ridges of Himalayas. Once winter sets in, they come down and keep travelling southward. This trait makes them one of the best examples of **transhumance**. Gujjars have been practicing nomadic life and still a small proportion of Gujjars continue to be in nomadic life. Lately, Gujjars have started sedentary life and slowly less number of herd is seen moving compared to earlier days. Apart from Gujjars, Gaddis and Bakkarwals are examples of nomadic community in India, which are also transhumance. The fight between human life and wild life is going to be new scenario of contestations that need our attention while studying adaptation in the mountainous terrain.

Transhumance is a practice practised by some partoralists and pastoral farmers by seasonal migration with their animals/herds in search of better fodders for their animals- a source of their livelihood. Gujjars and Bakkarwals are the examples in India who migrate towards higher altitudes during summer with their animals for natural pastures and climb down during winters. These communities make seasonal movements towards natural pastures located in different climatic regions.

Nagas

Nagas had very little or no contacts with the external world including mainland India till 19th Century when the British colonised the area.

Each Naga village is an independent republic. Initially, they wanted to be free from all outside domination and therefore have resisted all attempt to be administered by the people from outside. The Nagas are constituted by more than 20 tribes as well as numerous sub-tribes, and each one inhabits

a specific geographic region. Though they share many cultural traits, the tribes have maintained a high degree of isolation and lack cohesion as a single people. Among all, the Konyaks form the largest group followed by the Aos, Tangkhuls, Semas, and Angamis. Other tribes include the Lothas, Sangtams, Phoms, Changs, Khiemnungams, Yimchungres, Zeliangs, Chakhesangs (Chokri) and Rengmas.

There are about 60 spoken dialects amongst Nagas, all belonging to the Sino-Tibetan or Tibeto-Chinese language family. In some areas, dialects vary even between villages. Inter-tribal conversation generally is carried on through broken Assamese, and many Nagas speak Hindi and English. English is the official language of the state of Nagaland. The traditional Naga religion is animistic. The conceptions of a supreme creator and an afterlife also exist. Nature is believed to be alive with invisible forces, minor deities, and spirits with which priests and medicine men mediate.

Majority of the Naga population lives in small isolated villages. The villages were settled on the hills along ridges having enclosed with wooden gates. The villages are composed of khels or quarters with their own administration and headmen.

About 90 per cent of population is engaged in Agriculture. They grow primarily rice, corn (maize), small millets, pulses (legumes), oilseeds, fibres, sugarcane, potato, and tobacco. They practice *jhum* cultivation, which has led to soil erosion and loss of soil fertility. Some of them use terracing and irrigation techniques like Angamis and Chakhesangs of the southern regions of Kohima. Forestry is also a primary source of income and employment among Nagas.

SAQ 7

Why Gujjars are called transhumance community ?

4.5.5 Adaptation in Urban/Industrial Environment

Industries are not new to human beings across the globe if these are defined as improvisation or as value addition. It existed prior to agriculture and even during pre-historic times when human started using flint shaping the available stones. Though it is almost impossible to consider this improvisation as industrialisation or human adaptation to this as long as industrial production started being done for large-scale market outside of production locale. In this sense industrial mode of life began with trade and congregation of population that no longer remain in production for their subsistence. The proliferation of industries outside industrial core following the Industrial Revolution has brought sizeable number of population in interaction with industrial and urban environment. Again urban environment is not completely dependent on industrialisation. Urban communities, earning their living outside agricultural sector like craft, arts, religious activities and so on have been there since earliest civilizations like Harappa.

The post industrial revolution urban society has been market driven and located at the places that have requisite raw material for particular industry. This was truer when coal and petroleum were the sources of energy for most industries and raw material like iron-ore, mica, etc., had localised deposits and agricultural output like sugarcane, cotton and rubber had localised production. Industrial towns like Birmingham, Shanghai, Pennsylvania, etc. have developed; at the same time trade centres like London, Mumbai, Johannesburg, Tokyo and so on all along the coastal locations across colony and also in the core production regions have evolved during 17th, 18th, and 19th centuries. Human learnt to abide by digital and atomic clock rather than the erstwhile biological clock. The nature of work and the timings of work shifted from farm based sun synchronised timing to the factory/firm based clock timings of 8 am to 5 pm. With change in communication system, ownership of industries shifted across oceans and firms in effort to maintain the home country service timings the work timing in host countries have completely reversed. Prior to this reversal in effort of achieving economy of scale from the same sets of machineries Industrial firms adopted a round the clock production and started replacing labour in three shifts a day.

SAQ 8

Why biological clock got replaced with digital and atomic clock?

4.6 FORMS OF ADAPTATION IN HAZARDS

Before we talk about adaptation in hazards, we need to ask certain questions like, what is hazard. Are hazards and disasters same? What is the level of vulnerabilities in hazards and disasters? Who are most vulnerable if hazards/disasters are imminent? In this section we would try to answer these questions and then would outline the forms of adaptations in hazards.

Many geophysical events such as earthquakes, volcanic eruptions, landslides and/or floods have been recurring on the surface of the earth and have threatened the living organisms. The human presence to some degree has transformed some of these geophysical events into natural disasters; however, there still remain hazards purely natural like, most of the earthquakes. It is true that sometime natural hazards coupled with technological failures resulted into *na-tech* hazards like that of Fukushima in Japan in 2011, where earthquake led Tsunami resulted in leakage of radiation from the nuclear plant in coastal Japan. If we talk about the adaptation of people with hazards/disaster, Japan would be probably most important. The country is marred with frequent earth-quakes coupled with Tsunamis because it is located along the 'Ring of Fire' of the Pacific Rim. When we study the houses of Japan, we know most of them earlier used to be constructed of wood so that earthquake could do least damage. Now the houses are built of earthquake resistant building materials. The regions

United Nations International Strategy for Disaster Reduction (UNISDR) in 2009 defines disaster as "A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources."

Hazards are phenomena that pose a threat to the people, structures or economic assets and which may cause a disaster.

Vulnerability is a condition of any individual or community with its systems and assets to fall at risk by physical, social, economic, environmental and systemic factors.

that encounter frequent flood; houses are located on higher elevation and far from the river bed. The villages in the Ganga flood plains are located on natural levies or away from the area of river-bed. The city of Varanasi was located on the natural levies of river Ganga in the initial phase and was away from any devastating flood for about 2800 years. The expansion in recent decades has made the parts of the city vulnerable to flood as low-lying areas of river-bed of Varuna and Assi tributeries of Ganga have been inhabited.

Human sensitivity to environmental hazards is determined by the physical exposure of people and their assets to potentially damaging events and also by the degree of human vulnerability. Adaptation to hazards in present context, therefore, primarily gets linked to the understanding of the level of vulnerability of certain sections of society that is exposed to the hazards, which may turn to be a disaster. We know that conditions of vulnerability are outcomes of combination of factors including poverty, living conditions, distribution of power, exposure to risk and lack of capacity to cope with shocks and adverse situations. These factors are dynamic and keep changing through space and time. As you see that more than one factor contribute to the extent of vulnerability, there are different levels and types of vulnerabilities in the society: physical vulnerability and social vulnerability.

Physical vulnerability includes the hazard prone locations of settlement like coastal locations, flood plains, high altitudinal valley; insecure means of livelihood like fishing; lack of access to basic means of production like land, capital and other input. Higher altitudinal region has specific challenges including that of seasonality and specific health conditions.

Social vulnerability refers to the lack of institutional support structures and leadership, weak social support system and conflict with community and the absence of decision making power. In absence of these an individual or a group has least capabilities to negotiate the hazardous natural condition that in all probability can turn to a disaster.

Hazards are like the shocks and if the community is well prepared they can absorb the shock and if not prepared hazards can well cause injuries. In order of decreasing severity, hazards create following threats:

To people – deaths, disease, injury, mental and physical stress

To goods – property damage, economic loss

To environment – loss of flora and fauna, pollution, loss of amenity

In case of hazards, threats to human life are normally given the highest priority, followed by other kinds of losses.

People in contemporary scientific age try to prepare themselves for different kinds of hazards. The methods and means can differ in urban-industrial society, but intent remains similar i.e. to minimise the loss of life and reduce the response time. We find institution like QRT (Quick Response Teams), NDMC (National Disaster Management Council) and so on in our country. These institutions are involved in educating the masses about possible hazards/disasters and also to ensure timely response in case any such disaster occurs.

SAQ 9

Give some examples of forms of adaptations.

4.7 SUMMARY

In this unit you have studied:

- The relationship between human and environment and the basics of human adaptations to environment.
- Pre-agrarian, agrarian and industrial modes of activities.
- Human adaptations in various conditions like in cold region, hot region, plateau region, mountain region, urban/industrial environment with examples of different communities living in different parts of the world.
- Concept and different forms of livelihood.
- Forms of adaptation in hazards.

4.8 TERMINAL QUESTIONS

1. Explain the human-environment relationships with special reference to human adaption to environment.
2. How the concept of livelihood has changed? Who have threatened the livelihood of certain people?
3. Discuss about pre-agrarian, agrarian and industrial modes of activities with examples.
4. Describe the forms of adaptations and means of livelihood of Eskimos, Pygmys, Bushmans, Irulas, Gonds, Maasais, Gujjars, Nagas and urban/industrial societies.
5. How do you differentiate between hazard and disaster? What are the different types of vulnerability? What factors contribute in getting a hazard turn to be a disaster?

4.9 ANSWERS

Self-Assessment Questions

1. Human adaptation to environment is a situation when humans mould themselves for survival in different environmental conditions after reaching the limit of certain modification in the environment, which is manifested in various ways like livelihood practices, house structure, food, clothing, etc. The limitations by nature and technological constraints make human beings to adapt various environmental conditions.
2. Livelihood means making living which includes capabilities, capitals/ assets (natural, physical, social, economic, political or organisational and emotional) and activities required for a means of living.

3. Pre-agrarian, agrarian, and industrial modes of activities are different stages of human activities for livelihood and survival. Pre-agrarian mode of activities involve gathering followed by hunting by humans for survival. Agrarian mode of activities involve domestication of various plants and beginning of sedentary life of pre-industrial humans. Industrial mode of activities involve other than pre-agrarian and agrarian modes of activities due to agricultural surplus, capital accumulation and technological developments, which is primarily urban in nature.

4. Eskimos live in the extreme cold condition of the Arctic and Subarctic regions of Greenland, Canada, the United States, and far eastern Russia (Siberia). They earn their livelihood by fishing and hunting.

5. The regions of Pygmys are tropical Africa (Kongo Basin); Bushmans are found in Kalahari Desert, and Irulas inhabit primarily in Tamilnadu followed by Kerala in India.

6. Maasais' primary means of livelihood is cattle rearing and herding. Their secondary means of livelihood is growing maize or wheat, rearing Guinea fowl and raising ostriches. The age-sets is the basic institution of social integration among Maasais, where age class gets formed as permanent grouping based on the groupings of the same age that are initiated into adult life during same open-initiation period.

7. Gujjars are called transhumance community because they practise seasonal migration into different climatic regions with their animals/herds towards higher altitudes during summers and climb down during winters for natural pastures.

8. Industrial revolution replaced biological clock with digital and atomic clock due to changed nature of work and timings as the economic activities shifted from farm based sun-synchronised timings to factory and firm based clock timings of 8 am to 5 pm.

9. Some examples of forms of adaptations are Igloos, earthquake resistant buildings in the earthquake prone areas, tree houses, location of houses at higher elevation in the flood prone areas, etc.

Terminal Questions

1. You may explain the human-environment relationships with special reference to human adaption to environment through different forms of adaptations by human groups in different environmental conditions. Refer to Section 4.2.

2. Traditionally, the term livelihood refers to making living through the basic human adaptation methods in different climates. Now the concept has changed as sustainable livelihood in the era of changing climate and changing nature and structure of the state comprising capabilities, assets and activities required for a means of living. Thereafter you may explain that human beings only are partially responsible

for damaging the livelihood of certain people by deforestation, displacement, environmental degradation, pollution, etc. Refer to Section 4.3.

3. Discuss various human activities related to pre-agrarian, agrarian and industrial modes with citing suitable examples starting from hunting and gathering to cultivation and to industrial production or from sun-synchronous activities to clock guided activities. Refer to Section 4.4.

4. Describe various forms of adaptations and means of livelihood that Eskimos, Pygmys, Bushmans, Irulas, Gonds, Maasais, Gujjars, Nagas and urban/industrial societies have for their survival. Refer to Section 4.5.

5. First differentiate both the terms hazard and disaster and discuss about the types of vulnerability. Finally, discuss the factors, which contribute hazard in turning into disaster. Refer to Section 4.6.

4.10 REFERENCES AND FURTHER READING

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GLOSSARY

Agrarian : A stage of society having domestication of plants and sedentary life with cultivation of crops.

Areal Association : The association of two or more objects in an area.

Areal Science : The scientific study of the distinctiveness and individuality of areas and regions on the earth's surface.

Bedouin : Bedouins are the desert dwellers found in the Arabian desert.

Behaviouralism : An approach against quantitative revolution and positivism as the human behaviour in choosing activities are not always predictable by statistics due to human's own thinking capability, awareness and creativity.

Bushman : The 'Bushmen' are the inhabitants of hot region of southern Africa primarily spread over Kalahari Desert. They are hunters and gatherers.

Concentration : The extent of clustering of something over a given area.

Concept : Those characteristics, which are common to a group of experience.

Culture : The way of life of people.

Darwinism : The understanding of the theories written by Charles Darwin involving the development of an organism from a simple amoeba to more complex life forms.

Density : The frequency with which an item occurs within a given spatial unit.

Determinism or Environmental Determinism or Environmentalism : One of the approaches to human-environment interactions given by Friedrich Ratzel, which believes that the natural and physical environment impacts the complete functioning of human beings and their cultures. It in an approach to geographical study, which says that physical environment as active agent controls and guides the passive humans in their activities.

Diffusion : Process of spread of something across the earth's surface.

Disaster : Disaster is defined as "a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources."

Distance-decay : The reality of decreasing in intensity of interaction with increasing distance.

Environment : The natural world or the sum of physical, chemical and biological conditions of surrounding in any particular area or region where humans, plants or animals live.

Eskimo : Eskimos are the indigenous settlers of extreme cold areas of Arctic and Subarctic regions of Greenland, Canada, the United States, and far eastern Russia (Siberia) primarily surviving on hunting.

Gond : Gonds, the largest Scheduled Tribe community in India, are linguistically Dravidian and are spread over large parts of central and southern India, which is characterised with dense forest. Their mainstay is agriculture and they also practice *jhoom* cultivation.

Gujjar : Gujjars or Gurjars are the pastoral community spread over the spreads of western Himalayas. They practise transhumance by seasonal migration into different climatic regions with their animals/ herds towards higher altitudes during summer and climb down during winters for natural pastures.

Hazards : Hazards are phenomena that pose a threat to people, structures or economic assets and which may cause a disaster.

Human Adaptation : Human adaptation to environment is a situation when humans mould themselves for survival in different environmental conditions after reaching the limit of certain modification in their surrounding environment.

Industrial Modes of Activities : The activities after industrial revolution not regulated by biological clock and are urban in nature.

Irula : Irulas are the tribal people of Negrito ethnic group settled mainly in Tamilnadu followed by some in Kerala in India. Their main occupations are catching snakes and rats alongwith fishing.

Livelihood : Livelihood is overall means (capabilities, capitals or assets and activities) of making living.

Maasai : Maasais are the nomadic pastoral community of East Africa and their primary means of livelihood is cattle rearing and herding. Their secondary means of livelihood is growing maize or wheat, rearing Guinea fowl and raising ostriches.

Naga : Nagas are the tribal people residing in Nagaland state of North Eastern India having number of sub-tribes with many dialects belonging to the Tibeto-Chinese language family. They live in the small isolated villages along the ridges of hills and are engaged in agriculture. They also practice *jhum* cultivation.

Neo-Determinism or Stop-and-Go Determinism : One of the approaches to human-environment interactions, where humans are like traffic controller and should not go ahead against the nature's direction though humans can control their pace of development.

Positivism : Usage of rigorous scientific methods in geography.

Possibilism : An approach to geographical studies, where humans are seen as playing active roles in choosing their activities within the limitations and opportunities offered by the natural environment.

Post-Modernism : A new philosophy in geography emerged after modernism advocating a new approach to look at the world beyond grand narratives and capitalist views strongly asserting the importance of place against the placelessness of modern societies.

Pre-Agrarian : A stage of society with activities of gathering and hunting as primary mode of survival prior to the domestication of crops or a stage of society prior to the agricultural society.

Probabilism : Probabilism is one of the approaches to human-environment interactions, which advocates that though the natural environment in many situations may not completely determine human's activities, yet it possesses significant influences but human's have ability to manipulate them to a large extent such that some of human's activities are more probable than others in that natural environment. It emphasises the role of technology and its development phase in determining the probability of human activities that becomes a reality from the available choices or probabilities.

Pygmy : Pygmys are the humans of short height primarily inhabited in tropical Africa (Kongo Basin) and are mostly hunters and gatherers and do not practice agriculture and cattle rearing.

Quantitative Revolution : A period after the World War II (more precisely in 1960s) where the usage of extensive statistical and mathematical tools began in geographical studies.

Region : A particular area of the earth that has developed and constructed particular characteristics through different inter-relationships of human and his environment. Or an area having homogeneity based on one or combination of parameters.

Society : Network of social relationships.

Spatial Distribution : Arrangement of phenomena of similar kinds across the earth's surface.

Spatial Hierarchy : Arrangement of places or things in rank and order of importance.

Spatial Interaction : The movement of people, goods and ideas between geographical areas.

Spatial Pattern : Geometric arrangement of something in an area.

Transhumance : Transhumance is a practice by some partoralists and pastoral farmers doing seasonal migration with their animals/herds in search of natural pastures located in different climatic regions for their animals-a source of their livelihood.

Vulnerability : A condition of any individual or community with its systems and assets to fall at risk by physical, social, economic, environmental and systemic factors.