

HUMAN GEOGRAPHY

IV SEMESTER

ELECTIVE COURSE

HIS4 E02

M.A. HISTORY

(2019 Admission onwards)



UNIVERSITY OF CALICUT

School of Distance Education,

Calicut University P.O.,

Malappuram - 673 635, Kerala.

190516

UNIVERSITY OF CALICUT

School of Distance Education

Study Material

IV Semester

Elective Course (HIS4 E02)

M.A. HISTORY

HUMAN GEOGRAPHY

Prepared by:

*Sri. Vivek A.B.,
Asst. Professor of History,
SDE, University of Calicut.*

Scrutinized by:

*Dr. Rajan Vattolipuraikal,
Vice-Principal (Retd.),
Govt. College, Malappuram.*

DISCLAIMER

“The author shall be solely responsible for the content and views expressed in this book”

CONTENTS

Module: I.....	5
Module: II.....	49
Module: III.....	83
Module: IV	105

MODULE: I

WHAT IS GEOGRAPHY?

Geography is the study of places and the relationships between people and their environments. It explores both the physical properties of Earth's surface and the human societies spread across it. Another important field of Geography is the study of the interaction between human culture with the natural environment, and the way that environment can have an impact on people. Geography seeks to understand where things are found, why they are there, and how they develop and change over time.

Geography is an all-encompassing discipline. To put it simply, Geography is the scientific study of Earth. The main concern of Geography as a discipline is to understand the earth as home of living creatures, more particularly human beings and to study all those elements which have sustained them. As a discipline, it is the scientific study of the lands, land forms, features, inhabitants and the phenomena of Earth and its human and natural complexities. Geography as a field of study is integrative, empirical and practical. Thus, the reach of Geography is extensive and each and every event or phenomenon which varies over space and time can be studied geographically.

HISTORICAL DEVELOPMENT OF GEOGRAPHY

(a) Ancient Geographers

The term "Geography" comes to us from the ancient Greeks, who needed a word to describe the writings and maps that were helping them make sense of the world in which they lived. In Greek, Geo means "earth" and Graphy means "to write." Using

Geography, Greeks developed an understanding of where their homeland was located in relation to other places, what their own and other places were like, and how people and environments were distributed. These concerns have been central to geography ever since.

Ancient Greek geographers developed very detailed maps of areas in and around Greece, including parts of Europe, Africa, and Asia. More importantly, they also raised questions about how and why different human and natural patterns came into being on Earth's surface, and why variations existed from place to place. The effort to answer these questions about patterns and distribution led them to figure out that the world was round, to calculate Earth's circumference, and to develop explanations of everything from the seasonal flooding of the Nile River to differences in population densities from place to place.

Ancient Greeks created the earliest paper maps that were used for navigation, and to depict certain areas of the Earth. Anaximander was the first of the ancient Greeks to draw a map of the known world, and, as such, he is considered to be one of the first cartographers. Hecataeus, Herodotus, Eratosthenes, and Ptolemy were other well-known Greek map makers. The maps they drew were based on explorer observations and mathematical calculations.

During the Middle Ages, Geography ceased to be a major academic pursuit in Europe due to many a reason. Advances in geography were chiefly made by scientists of the Muslim world, based around the Arabian Peninsula and North Africa. Geographers of this Islamic Golden Age created the world's first rectangular map based on a grid, a map system that is still familiar

today. Islamic scholars also applied their study of people and places to agriculture, determining which crops and livestock were most suited to specific habitats or environments.

In addition to the advances in the Middle East, the Chinese empire in Asia also contributed immensely to geography. Until about 1500 C.E., China was the most prosperous civilization on Earth. The Chinese were scientifically advanced, especially in the field of astronomy. Around 1000 C.E., they also achieved one of the most important developments in the history of geography: They were the first to use the compass for navigational purposes. In the early 1400s, the explorer Cheng Ho embarked on seven voyages to the lands bordering the China Sea and the Indian Ocean, establishing China's dominance throughout Southeast Asia.

(b) Age of Discovery

Through the 13th century travels of the Italian explorer Marco Polo, Europeans learned about the riches of China. Curiosity was awakened; a desire to trade with wealthy Asian cultures motivated a renewed interest in exploring the world. The period of time between the 15th and 17th centuries is known in the West as the Age of Exploration or the Age of Discovery.

With the dawn of the Age of Discovery, the study of geography regained popularity in Europe. The invention of the printing press in the mid-1400s helped spread geographic knowledge by making maps and charts widely available. Improvements in shipbuilding and navigation facilitated more exploring, greatly improving the accuracy of maps and geographic information.

Greater geographic understanding allowed European powers to extend their global influence. During the Age of Discovery, European nations established colonies around the world. Improved transportation, communication, and navigational

technology allowed countries such as the United Kingdom to successfully govern colonies as far away as the Americas, Asia, Australia, and Africa.

Geography was not just a subject that made colonialism possible. However, it also helped people understand the planet on which they lived. Not surprisingly, Geography became an important focus of study in schools and universities.

Geography also became an important part of other academic disciplines, such as chemistry, economics, and philosophy. In fact, every academic subject has some geographic connection. Chemists study where certain chemical elements, such as gold or silver, can be found. Economists examine which nations trade with other nations, and what resources are exchanged. Philosophers analyse the responsibility people have to take care of the Earth.

(c) Emergence of Modern Geography

Some people have trouble in understanding the complete scope of the discipline of Geography because, unlike most other disciplines, geography is not defined by one particular topic. Instead, Geography is concerned with many different topics - people, culture, politics, settlements, plants, landforms, and much more.

What distinguishes Geography is that it approaches the study of diverse topics in a particular way (that is, from a particular perspective). Geography asks **spatial questions**—how and why things are distributed or arranged in particular ways on Earth’s surface. It looks at these different distributions and arrangements at many different scales. It also asks questions about how the interaction of different human and natural activities on Earth’s surface shape the characteristics of the world in which we live.

Geography seeks to understand where things are found and why they are present in those places; how things that are located in the same or distant places influence one another over time; and why places and the people who live in them develop and change in particular ways. Raising these questions is at the heart of the “geographic perspective.”

Exploration has long been an important part of geography. But exploration no longer simply means going to places that have not been visited before. It means documenting and trying to explain the variations that exist across the surface of Earth, as well as figuring out what those variations mean for the future.

The age-old practice of mapping still plays an important role in this type of exploration, but exploration can also be done by using images from satellites or gathering information from interviews. Discoveries can come by using computers to map and analyse the relationship among things in geographic space, or from piecing together the multiple forces, near and far that shape the way individual places develop.

Applying a geographic perspective demonstrates Geography’s concern not just with where things are, but with “the why of where” - a short, but useful definition of geography’s central focus.

The insights that have come from geographic research show the importance of asking “the why of where” questions. Geographic studies comparing physical characteristics of continents on either side of the Atlantic Ocean, for instance, gave rise to the idea that Earth’s surface is comprised of large, slowly moving plates - plate tectonics.

Studies of the geographic distribution of human settlements have shown how economic forces and modes of transport influence the

location of towns and cities. For example, geographic analysis has pointed to the role of the U.S. Interstate Highway System and the rapid growth of car ownership in creating a boom in U.S. suburban growth after World War II. The geographic perspective helped show where Americans were moving, why they were moving there, and how their new living places affected their lives, their relationships with others, and their interactions with the environment.

Geographic analyses of the spread of diseases have pointed to the conditions that allow particular diseases to develop and spread. Dr. John Snow's cholera map stands out as a classic example. When cholera broke out in London, England, in 1854, Snow represented the deaths per household on a street map. Using the map, he was able to trace the source of the outbreak to a water pump on the corner of Broad Street and Cambridge Street. The geographic perspective helped identify the source of the problem (the water from a specific pump) and allowed people to avoid the disease (avoiding water from that pump).

Investigations of the geographic impact of human activities have advanced the understanding of the role of humans in transforming the surface of Earth, exposing the spatial extent of threats such as water pollution by manmade waste. For example, geographic study has shown that a large mass of tiny pieces of plastic currently floating in the Pacific Ocean is approximately the size of Texas. Satellite images and other geographic technology identified the so-called "Great Pacific Garbage Patch."

These examples of different uses of the geographic perspective help explain why Geographic study and research is important as we confront many 21st century challenges, including environmental pollution, poverty, hunger, health disparities and ethnic or political conflict.

BRANCHES OF GEOGRAPHY

Geography as a field of study is an all-encompassing discipline.

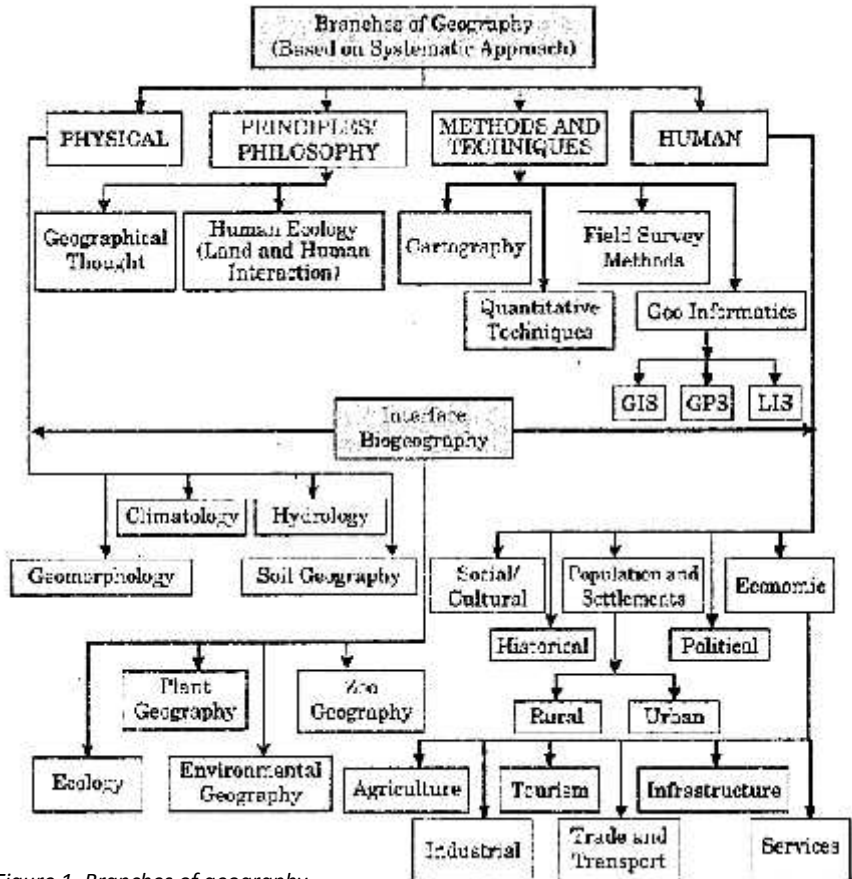


Figure 1. Branches of geography

The study of Geography is so broad and it is the mother discipline, which is typically divided into specialties. At the broadest level, Geography is divided into **Physical Geography, Human Geography, Geographic Techniques, and Regional Geography.**

(a) Physical Geography

The natural environment is the primary concern of physical geographers, although many physical geographers also look at how humans have altered natural systems. Physical geographers study Earth's seasons, climate, atmosphere, soil, streams, landforms, and oceans. Some disciplines within Physical Geography include Geomorphology, Glaciology, Pedology, Hydrology, Climatology, Biogeography, and Oceanography.

<i>Geomorphology</i>	Geomorphology is the study of landforms and the processes that shape them. Geomorphologists investigate the nature and impact of wind, ice, rivers, erosion, earthquakes, volcanoes, living things, and other forces that shape and change the surface of the Earth.
<i>Glaciology</i>	Glaciologists focus on the Earth's ice fields and their impact on the planet's climate. Glaciologists document the properties and distribution of glaciers and icebergs. Data collected by glaciologists has demonstrated the retreat of Arctic and Antarctic ice in the past century.
<i>Pedology</i>	Pedologists study soil and how it is created, changed, and classified. Soil studies are used by a variety of professions, from farmers analysing field fertility to engineers investigating the suitability of different areas for building heavy structures.

<p><i>Hydrology</i></p>	<p>Hydrology is the study of Earth’s water: its properties, distribution, and effects. Hydrologists are especially concerned with the movement of water as it cycles from the ocean to the atmosphere, then back to Earth’s surface. Hydrologists study the water cycle through rainfall into streams, lakes, the soil, and underground aquifers.</p>
<p><i>Climatology</i></p>	<p>Climatologists study Earth’s climate system and its impact on Earth’s surface. For example, climatologists make predictions about El Nino, a cyclical weather phenomenon of warm surface temperatures in the Pacific Ocean.</p>
<p><i>Biogeography</i></p>	<p>Biogeographers study the impact of the environment on the distribution of plants and animals. For example, a biogeographer might document all the places in the world inhabited by a certain spider species, and what those places have in common.</p>
<p><i>Oceanography</i></p>	<p>Oceanography, a related discipline of physical geography, focuses on the creatures and environments of the world’s oceans. Observation of ocean tides and currents constituted some of the first oceanographic investigations. For example, 18th-century mariners figured out the geography of the Gulf Stream, a massive current flowing like a river through the Atlantic Ocean. The discovery and tracking of the Gulf Stream helped</p>

communications and travel between Europe and the Americas.

Today, oceanographers conduct research on the impacts of water pollution, track tsunamis, design offshore oil rigs, investigate underwater eruptions of lava, and study all types of marine organisms from toxic algae to friendly dolphins.

(b) Human Geography

Human geography or Anthropogeography is concerned with the distribution and networks of people and cultures on Earth's surface. Human Geography studies "the relationship between the physical/natural and the human worlds, the spatial distributions of human phenomena and how they come about, the social and economic differences between different parts of the world". A human geographer might investigate the local, regional, and global impact of rising economic powers China and India, which represent 37 percent of the world's population. They also might look at how consumers in China and India adjust to new technology and markets, and how markets respond to such a huge consumer base.

Human geographers also study how people use and alter their environments. For instance, when people allow their animals to overgraze a region, the soil erodes and grassland is transformed into desert. The impact of overgrazing on the landscape as well as on agricultural production is an area of study for human geographers. Moreover, human beings interact with their physical environment with the help and use of technology. It is important what human beings produce and create but it is extremely important with 'the help of what tools and techniques do they produce and create'. Hence technology plays a vital role in the interactions of human beings with their environment. The use of

technology, and the vibrant development of technology loosen the shackles of environment on human beings.

Finally, human geographers study how political, social, and economic systems are organized across geographical space. These include governments, religious organizations, and trade partnerships. The boundaries of these groups constantly change.

The main divisions within Human Geography reflect a concern with different types of human activities or ways of living. Some examples of human geography include Urban Geography, Economic Geography, Cultural Geography, Political Geography, Social Geography, and Population Geography. Human geographers who study geographic patterns and processes in past times are part of the sub-discipline of Historical Geography. Those who study how people understand maps and geographic space belong to a sub-discipline known as Behavioural Geography.

Many human geographers interested in the relationship between humans and the environment work in the sub-disciplines of Cultural Geography and Political Geography.

Cultural geographers study how the natural environment influences the development of human culture, such as how the climate affects the agricultural practices of a region. Political geographers study the impact of political circumstances on interactions between people and their environment, as well as environmental conflicts, such as disputes over water rights.

Some human geographers focus on the connection between human health and geography. For example, health geographers create maps that track the location and spread of specific diseases. They analyse the geographic disparities of health-care access. They are very interested in the impact of the environment on

human health, especially the effects of environmental hazards such as radiation, lead poisoning, or water pollution.

(c) Geographic Techniques

Specialists in Geographic Techniques study the ways in which geographic processes can be analysed and represented using different methods and technologies. Mapmaking, or cartography, is perhaps the most basic of these. Cartography has been instrumental to geography throughout the ages.

As early as 1500 B.C.E, Polynesian navigators in the Pacific Ocean used complex maps made of tiny sticks and shells that represented islands and ocean currents they would encounter on their voyages. Today, satellites placed into orbit by the U.S. Department of Defence communicate with receivers on the ground called global positioning system (GPS) units to instantly identify exact locations on Earth.

Today, almost the entire surface of Earth has been mapped with remarkable accuracy, and much of this information is available instantly on the internet. One of the most remarkable of these websites is Google Earth, which “lets you fly anywhere on Earth to view satellite imagery, maps, terrain, 3D buildings, from galaxies in outer space to the canyons of the ocean.” In essence, anyone can be a virtual Christopher Columbus from the comfort of home. Technological developments during the past 100 years have given rise to a number of other specialties for scientists studying geographic techniques. The airplane made it possible to photograph land from above. Now, there are many satellites and other above-Earth vehicles that help geographers figure out what the surface of the planet looks like and how it is changing.

Geographers looking at what above-Earth cameras and sensors reveal are specialists in remote sensing. Pictures taken from space

can be used to make maps, monitor ice melt, assess flood damage, track oil spills, predict weather, or perform endless other functions. For example, by comparing satellite photos taken from 1955 to 2007, scientists from the U.S. Geological Survey (USGS) discovered that the rate of coastal erosion along Alaska's Beaufort Sea had doubled.

Computerized systems that allow for precise calculations of how things are distributed and relate to one another have made the study of geographic information systems (GIS) an increasingly important specialty within geography. Geographic information systems are powerful databases that collect all types of information (maps, reports, statistics, satellite images, surveys, demographic data, and more) and link each piece of data to a geographic reference point, such as geographic coordinates. This data, called geospatial information, can be stored, analysed, modelled, and manipulated in ways not possible before GIS computer technology existed.

The popularity and importance of GIS has given rise to a new science known as **Geographic Information Science (GISci)**. Geographic information scientists study patterns in nature as well as human development. They might study natural hazards, such as Uttarakhand Flash Floods, in 2013. GIS can also illustrate human struggles from a geographic perspective. For example, interactive maps of affected areas can be created and kept updated for better understanding of the geographical context of the hazard.

Geographic Information Science or Geographical Information Science (GIScience or GISc) is the scientific discipline that studies the techniques to capture, represent, process, and analyse geographic information.

The enormous possibilities for producing computerized maps and diagrams that can help us understand environmental and social problems have made geographic visualization an increasingly important specialty within geography. This geospatial information is in high demand by just about every institution, from government agencies monitoring water quality to entrepreneurs deciding where to locate new businesses.

(d) Regional Geography

Regional geographers take a somewhat different approach to specialization, directing their attention to the general geographic characteristics of a region. A regional geographer might specialize in African studies, observing and documenting the people, nations, rivers, mountains, deserts, weather, trade, and other attributes of the continent. There are different ways you can define a region. You can look at climate zones, cultural regions, or political regions. Often regional geographers have a physical or human geography specialty as well as a regional specialty.

Regional geographers may also study smaller regions, such as urban areas. A regional geographer may be interested in the way a city like Ahmedabad is growing. They would study transportation, migration, housing, and language use, as well as the human impact on elements of the natural environment, such as the Sabarmati River.

Whether geography is thought of as a discipline or as a basic feature of our world, developing an understanding of the subject is important. Some grasp of geography is essential as people seek to make sense of the world and understand their place in it. Thinking geographically helps people to be aware of the connections among and between places and to see how important events are shaped by where they take place.

Finally, knowing something about geography enriches people's lives—promoting curiosity about other people and places and an appreciation of the patterns, environments, and peoples that make up the endlessly fascinating, varied planet on which we live.

DEVELOPMENT OF HUMAN GEOGRAPHY

(a) Age of Cosmography and Exploration

From the 15th century onwards, the quality and volume of the geographical knowledge had witnessed a significant expansion. 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.

Cosmography is the branch of science which deals with the general features of the universe, including the earth.

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. The environmental impacts on human behaviour were also observed and documented (Jean Bodin's work of 1566, Nathanael Carpenter's work in 1625 C.E. and Charles Louis Montesquieu'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. The period also witnessed the publication of the Theory of Evolution propounded by Charles Darwin in his book "The Origin of Species" in 1859. 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.

(b) 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. 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. Gradually 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 professors was Paul Vidal de la Blache appointed in 1873.

The study of Geography in its beginning 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* (meaning: geography) 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 Friedrich Ratzel in 1882 in the form of *Anthropogeographie* created a landmark in Human Geography. His path breaking innovations made Ratzel 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 the study of Human Geography with the publication of 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.

Anthropogeographie is the synthesis of studies on human societies and physical environment and their relationships

It was carried forward by his disciple, 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.

***Social Darwinism** is the theory that individuals, groups, and peoples are subject to the same Darwinian laws of natural selection as plants and animals. Now largely discredited, social Darwinism was advocated by Herbert Spencer and others in the late 19th and early 20th centuries and was used to justify political conservatism, imperialism, and racism and to discourage intervention and reform.*

Huntington also contributed human geography through his book “The Principle of Human Geography” writing on environmental determinism highlighting climate primarily as the factor for 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 its 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 the above three approaches. The subsequent decades witnessed the 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 in its study. 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 up to 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.

***Environmental determinism** is the belief that the environment, most notably its physical factors such as landforms and climate, determines the patterns of human culture and societal development.*

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) approaches transformed the nature and identity of human geography during this phase.

In the late 1950s, the first attempt to revolutionize Human Geography took place along with some strong theoretical base. It was a blend 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 and it continues 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 a 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 study of Human geography rigorously, especially based on mathematical reasoning and statistical techniques for synthesis and analysis also 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 times 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).

(c) Post Modern Period

Since late 1980s, Human Geography started getting more exposed to the Philosophy of Science, Social Sciences and Humanities. Further, it started showing more concern with 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 branches of Human Geography emerged 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.

Here are some of the definitions of Human Geography!

“Human Geography is the synthetic study of relationship between human societies and earth’s surface”. This is the definition put forwarded by Ratzel

“Human Geography is the study of “changing relationship between the un resting man and the unstable earth”. It is the definition of Ellen C. Semple

“Conception resulting from a more synthetic knowledge of the physical laws governing our earth and of the relations between the living beings which inhabit it”. This definition is given by Paul Vidal de la Blache.

PERSPECTIVES OF HUMAN GEOGRAPHY

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 study of space and place in their ever-changing dimensions. It looks at multiple-dimensions of things and phenomena towards the exploration of the reality in its completeness by analysing 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 how far Human Geography differ from 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)

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, political aspects as each one of these are huge and require specialised attention.

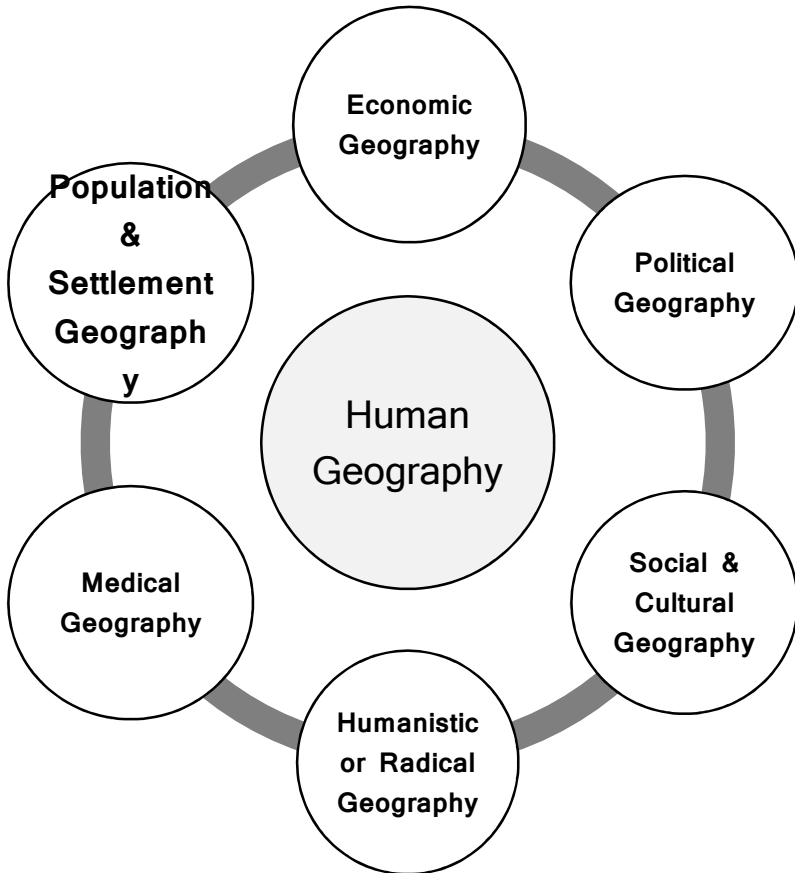
For example, economic aspects of human life include agriculture, livestock and allied activities, industry and services. Therefore, we need to take a look at multiple sub disciplines and branches within human geography that have developed over time. Many may have faded away and many new may still be in their infancy.

Branches

As Human Geography focuses on the study of patterns and processes that shape 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:

Main Branches of Human Geography



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.

Relevance of Human Geography

Human geography is a very relevant and significant discipline in the present day world. Despite micro-specialisation, it remained to be the only discipline having the capability of conducting holistic study of real world by synthesizing various spheres of the reality. The roles and relevance have 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 in a given region or world at large, 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 also contributes to the exploration of knowledge 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 production and exploration.

Concepts in Human Geography

Concepts are important parts of a discipline as they provide 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. In 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.

(a) 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.

The third is Phenomenal scale, which 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.

(b) 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 the laymen's 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.



Figure 2. Immanuel Kant

Traditionally, the concepts of time and space are used as the starting point of defining history and geography, respectively. 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 had 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.E.), 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.

(c) 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 land forms, 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.

(d) 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.

(e) 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 movement 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 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.

(f) 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 could have occurred 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 towns of Kerala, one often finds wholesale speciality shops, such as wood works, provision stores, grain shops, etc. located in a close proximity with one another. They are locally known as *Viraku Kada* (wood market), *Palacharakku kada* (provision stores), *Ari market* (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.

(g) 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, tank 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). Humanmade 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, certain order and regularity are generally observed in patterns of interactions among places. We know that the level of interaction between places depends to a large extent on their population size (as well as their functional importance) 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, students of Human Geography raise the following questions.

(h) 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, industrial 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 broadly divide human society into two; 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 the term Culture. In the first place, 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 parts 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 closet 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 and crucial to understand the organisation of Space.

(i) Anthropogeography

Anthropogeography is a term used predominantly in the late 19th and early 20th centuries that means roughly “the geography of humans.” As noted earlier, the term comes from **Anthropogeographie**, the title of a two-volume work published in 1882 and 1891 by the German geographer Friedrich Ratzel, who is well known for his influence in early Human Geography, particularly his thought in Political Geography. Ratzel strongly influenced the thinking and thought process of the well-known American geographer Ellen Churchill Semple, who introduced Ratzel’s anthropogeography to North America through her work *Influences of Geographic Environment: On the Basis of Ratzel’s System of Anthro-Geography*, published in 1911. Some thinkers like, the geographer J. K. Wright, criticized Semple for not clearly stating which ideas were hers and which originated from Ratzel.

(j) Spatial Process

Geography involves the study of why things vary from place to place on the earth, also known as Spatial distributions or anything that can be mapped. Spatial distributions that can be mapped

include anything from temperatures in an ocean, the language of a country, the spread of forest fires in a region, to the ethnic demographics of a particular city.

A specific question a geographer might ask is, why people of a certain ethnic background have migrated to another area of the world. Once a geographer knows what phenomenon they want to study, they'll look at the underlying process for how things came to be a certain way, such as how the migration occurred. They also try to predict what is going to happen in the future, like whether people will continue to migrate to a particular area or not.

The underlying process that geographers study is known as a spatial process. A spatial process explains how people came to live in a certain area because it answers the question: Why does this spatial distribution exist?

A process is involved in every spatial distribution that can be mapped: from temperatures in an ocean, the language of society, the spread of forest fires in a region, and the ethnic demographics of a particular city. Let's focus on one example to see how a geographer might connect a certain spatial distribution with the spatial process involved.

The Irish potato famine in the 19th century contributed to Irish migration to the United States during that time. People were starving and sometimes without work, and they were looking for an opportunity in another region. Looking at these events as spatial processes, these help us to consider how and why the numbers of Irish people in the United States increased and why people chose to leave Ireland.

In this case, the spatial distribution was the Irish-American population in the United States, and the spatial process was the series of physical, environmental and human events that led to this change.

MODULE -II

GEOGRAPHY OF EARLY INDIA

India stretches from Alpine glaciers to the hottest rainforests on Earth. Such a diverse group of landforms have heavily impacted early civilization, starting with the very first settlements on the Indus and the Ganges Rivers. The Indian Subcontinent is roughly the same size as Western Europe, so it is no surprise that it contains some of the most diverse landforms imaginable. In fact, India's geography makes it a land of extremes, most notably in the north. It was here, in the Indo-Gangetic Plain, the river valleys created by India's two great rivers-the Indus and the Ganges- that civilizations first developed in the subcontinent.

India is separated from the rest of the Asian continent by the Himalayan Mountains in the north and north- east and Hindu Kush in the west. Much of India is covered by fertile plains and rugged plateaus. Several major rivers flow out of the Himalayas. The Indus River and its river valley was the cradle of India's first civilization.

The Indus Valley Civilization. (c.3000 - c. 1500 BCE)

The Indus Valley Civilization was a cultural and political entity which flourished in the northern western region of the Indian subcontinent between c. 3000 - c. 1500 B.C.E. Its modern name derives from its location in the valley of the Indus River, but it is also commonly referred to as the Indus Civilization or the Harappan Civilization. The two best-known excavated cities of this culture are Harappa and Mohenjo-Daro (located in modern-day Pakistan), both of which are thought to have once had populations of between 40,000-50,000 people, which is stunning

when one realizes that most ancient cities had on average 10,000 people living in them. The total population of the civilization is thought to have been upward of 5 million, and its territory stretched over 1,500 kms along the banks of the Indus River and then in all directions outward. Indus Valley Civilization sites have been found near the border of Nepal, in Afghanistan, on the coasts of India, and around Delhi, to name only a few locations.

Between c. 1900 - c. 1500 BCE, the civilization began to decline for many reasons. In the early 20th century C.E., this was thought to have been caused by an invasion of light-skinned peoples from the north known as Aryans who conquered a dark-skinned people, categorised by Western scholars as Dravidians. This claim, known as the Aryan Invasion Theory, has been discredited. The Aryans – a Linguistic group is associated with the Iranian Persians – are now believed to have migrated to the region in different waves and blended their culture with that of the indigenous people while the term Dravidian is understood now to refer to anyone, of any ethnicity, who speaks one of the Dravidian languages.



Figure 3. Sites of Indus Civilisation

Settlements along the Ganges River started somewhat later than those in the Indus Valley, but many of these still exist today as some of the most important cities in Indian cultural history. After the arrival of the Aryans, it was the towns along the Ganges that would serve as the holy sites for much of Hinduism. The river became crucial to the beliefs of people throughout India.

The Vedic Period (c. 1500 – c. 600 B.C.E.)

The Vedic Period (or Vedic Age) was the period in the history of India during which the Vedas, the oldest sacred texts of Hinduism, were being composed. Based on literary evidence, scholars place the Vedic period in the second and first millennia B.C.E. continuing up to the sixth century B.C.E. The associated culture, sometimes referred to as Vedic Culture, was centered around the northern and north-western parts of the Indian subcontinent. Its early phase saw the formation of small tribal principalities and in course of time, various kingdoms of ancient India. In its late phase (from ca. 600 B.C.E.), it saw the rise of the Mahajanapadas, and was succeeded by the Maurya Empire (from ca. 321 B.C.E.), the classical age of Sanskrit literature, and the Middle kingdoms of India. The literary legacy from this period does not contain much detailed historical information. However, the Vedic Period marked the beginning of historic period in Indian history.

The literary legacy, however, does take us back to one of very earliest human societies. Some claim that the line from Vedic times to the present represents the oldest known continuous civilization on earth.

Second urbanisation (c. 600 B.C.E) The expansion of agriculture and the ensuing surplus and the consequent stationary life led to an increase in the number of settlements in the Ganga Valley. Hastinapura, Atranjikhera, Noh and Vira anagara were some of the noteworthy sites which have provided evidence of the Painted Grey Ware Culture. The use of iron ushered in long-standing changes in the areas of agriculture, transport and trade. The iron ploughshare was used to till the thick layers of the alluvial soil in the Ganga Plains.



Figure 4. Indian cities of 600 B.C.E

Villages (*janapadas*) were brought together to form the Mahajanapadas and the references to these Mahajanapadas are found in the *Mahabharata* as well as Buddhist and Jain texts.

All these Mahajanapadas had a capital city and in the 6th century B.C.E, Champa (the capital of Anga), Rajagriha (capital of Magadha), Sravasti (capital of Kosala), Mathura (capital of Surasena), Kausambi (capital of Vatsa) and Varanasi (capital of

Kasi) were the six great cities of the times. The capitals of these territorial states became centres of centralised political power.

Some cities were also centers of economic power and commerce. Such cities were called '*nigamas*'. Certain cities were also market towns which served as strategic trade stations for the exchange of merchandise. Major trade routes passed through these cities. The flowering of new religious ideas embodied by Buddhism and Jainism played vital roles, albeit indirectly, in the growth of cities.

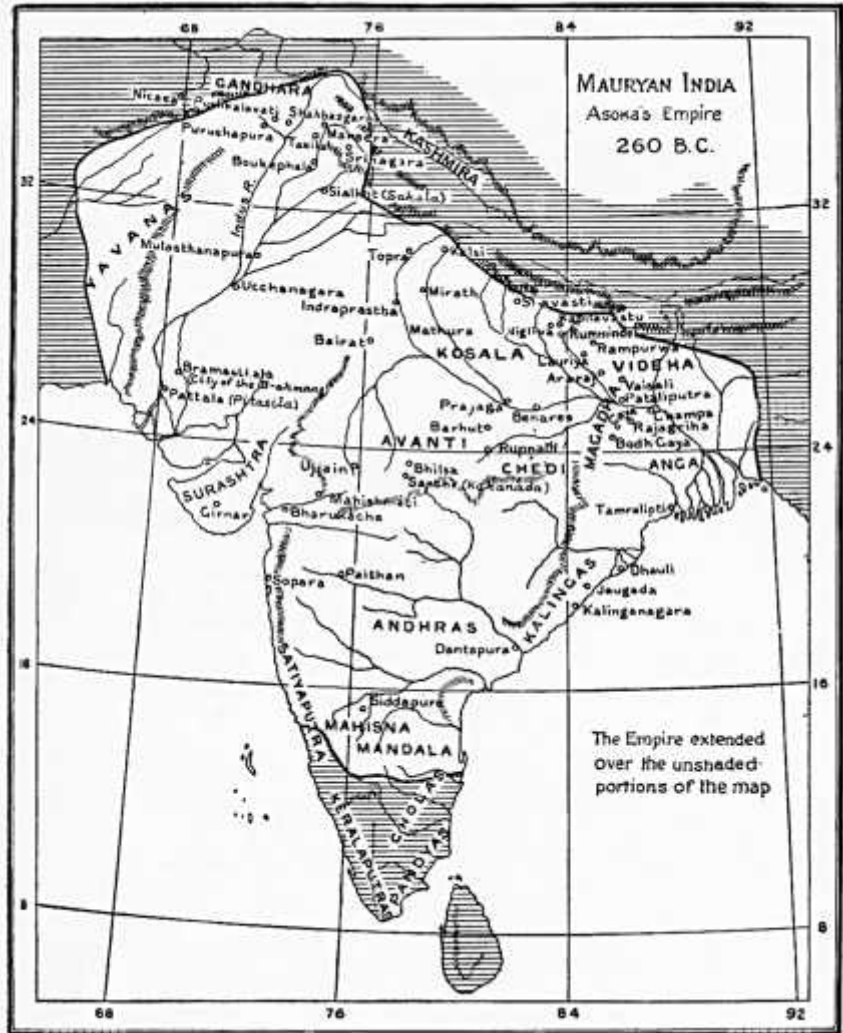
There were in all sixteen Mahajanapadas and eventually Magadha superseded all of them to emerge as the single largest Mahajanapada and ultimately a vast empire under the able leadership of Chandragupta Maurya, who was well supported by Kautilya or Chanakya.

THE MAURYAN EMPIRE

In 327 BCE, Alexander of Macedon and his troops entered India and overran the existing kingdoms in the Punjab region. After almost two years, he left India, but his destruction of the regional powers opened the opportunity for other groups to seize control. The first and foremost power, the kingdom of Magadha, used its military to gain control of trade routes through the Ganges valley and the sea routes to the Bay of Bengal.

Soon after, Chandragupta Maurya, the founder of the Maurya Empire, successfully seized control of Magadha. He started on the outskirts and after defeating the last ruler of the Nanda dynasty, he eventually made his way to the heart of the kingdom. Eventually, he gained control of north-western India and Bactria—what is today Afghanistan and was at that time controlled by the Greeks. Chandragupta Maurya successfully unified almost all parts of the Indian subcontinent under an empire.

Chandragupta ruled from 321 to 297 B.C.E. and he was succeeded by his son, Bindusara, who ruled from 297 B.C.E until his death in 272 B.C.E. The internal conflicts after his death, finally led to the rise of Ashoka, Bindusara's son, to the throne of



the Mauryan empire in 268 B.C.E, eventually becoming the most successful and powerful ruler of the Maurya Dynasty.

The Mauryan Army, the largest standing army of its time, supported the expansion and defense of the empire. According to scholars, the empire wielded 600,000 infantry, or foot soldiers, 30,000 cavalries, or soldiers on horseback, and 9,000 war elephants. A vast spy network collected intelligence for both internal and external security purposes. Although Emperor Ashoka renounced offensive warfare and expansionism after his victory over Kalinga and his conversion to Buddhism, he maintained this standing army to protect the empire from external threats and maintain stability and peace across Western and Southern Asia.

This extensive army was made possible partly through an intricate web of administration. One of Chandragupta's advisors had instituted a series of detailed procedures which Ashoka inherited. Ashoka strengthened the capital at the walled city of Pataliputra, which served as the centralized hub of the empire. Officials made decisions about how to collect taxes for the central treasury, which funded the military and other government jobs.

The Maurya Empire's political unity and internal peace were conducive for the expansion of trade in India. During Ashoka's reign, government oversaw the building of major roadways, and the Mauryan international network of trade expanded. India's exports to places like Bactria and Persia included silk, textiles, and spices.

THE GUPTA EMPIRE

The Gupta empire was founded by Sri Gupta sometime between 240 and 280 C.E. Sri Gupta's son and successor, Ghatotkacha,

Figure 5. extent of Mauryan Empire ruled from around 280 to

319 C.E. Ghatotkacha was succeeded by his son, Chandragupta I and he is considered as the real founder of the Gupta line and ascended the throne around 319 and ruled until 335 C.E.

Samudragupta succeeded his father, Chandragupta I, in 335 C.E. and ruled for about 45 years. By his death in 380 C.E., Samudragupta had incorporated over 20 kingdoms into his realm and extended the Gupta Empire from the Himalayas to the Narmada River in central India and from the Brahmaputra River to the Yamuna—the longest tributary of the Ganges River in northern India.

The merchants used to move about in the rivers as they wished, as if in tanks, in the forests as if in their own houses... As he (the king) used to protect the earth so she too gave him gems out of mines, corns from fields and elephants from forests.” (Raghu Vamsha XVII,64,66)

TRADE ROUTES OF ANCIENT INDIA

India is almost as large as Europe excluding Russia. The extensive coastline of India fostered inland trade and maritime activity so as to bore the title of country of mariners. Trade was both foreign and inland, sea borne and river borne, export and import. Al Biruni states that the sea-shore of India begins from Tiz, which was near present Chabahar in Persian Gulf. Many of the then flourishing ports received the various commodities of export qualities from all quarters of India which naturally required the established trade routes throughout India.

Vedic literature constantly remembers the early path finders. Agni is designated as *Pathikrit*. By burning Vast jungle tracks it created routes. Following such routes, the communication was

naturally promoted. In the beginning the pleasures and pains of travel depended on the geographical situations of the trade routes and measures taken to safeguard them against predators and wild animals.

The ancient routes followed by the conquerors, rulers, pilgrims, wanderers and merchants did not pass through the smiling green fields on both sides, villages, towns and cities. Majority of the people lived in villages and most part of the country was covered with dense forests through which the roads passed. These roads were often infested with wild animals and robbers lay in wait for travellers. They also had to carry their food provisions. The long routes had to cross rivers, hills, mountains and valleys. We are tempted to think that comparing to modern routes and means of communication, in ancient time it was just impossible to travel such long distances. However, the fact is that the traders and merchants had travelled long distances of about 2500 or 3000 kilometers from Assam to Gandhara and from Himachal to Vindhya and thence to the south up to Tamilnadu in ancient times.

Organized trade and industry

In the first millennium B.C.E trade and industry were highly organized in India. Srenis or Guilds were formed as corporations following the same trade or industry. Scattered references provide clear picture of extensive character of the organizations of the various branches of trade and industry. There were guilds of merchants. *Sresthi* was the president of the guild. This system of guilds was uniform in almost all over India. The guild also worked as a bank. The wealth and importance of the guilds is indicated in Kautilya's *Arthashastra*. In ideal town planning, separate quarters were reserved for the guilds.

The guilds received the deposits (*Nikshepa*) undertaking to devote annual interest for specific charities. Net balance of the customer was called *Nivi* which was the amount in saving after deducting expenditures incurred and revenues to be realized. The ancient trade routes naturally ran along the commercial cities and towns of different states and kingdoms. The network of trade was such that the merchants found no difficulty in transaction business. For example, the promissory note of the merchant of Vaishali could be honoured in Mahishmati in Avanti (Madhya Pradesh) or at Junnar in Maharashtra.

India was essentially an agriculturist country however due to the industry and international trade she was also called Golden land - 'Suvarna Bhoomi'. Suvarnabhumi is purely an economic term. In the early centuries, India was known for its items of exports. The streams of gold from all directions flowed towards India. For example, annual draining of the Roman empire of its gold valued at fifty million sesterces. In his Natural History, the contemporary writer Pliny the Elder gives a caution to the Roman government, "If such drainage continues the empire will have to face a serious crisis of economy." The very interesting account of inland as well as foreign trade of India is given in the book *Periplus of the Erythraen sea*, The *Yavana* (Greek) writer of this book is unknown. He may be an Egyptian Greek and a merchant in active trade who personally made the voyage to India in the second half of the first century CE. He describes the inland commercial trading centers and flourishing ports of western and southern India.

Sartha (Caravan)

Inland trade was carried on by carts and caravans. The Caravans (Sartha) were well organised and had hundreds of bullock carts; the captain of the Sartha was called *Sarthavaha*. It had large

provisions to maintain the caravan moving on long routes facing many difficulties such as crossing of the rivers, hills, valleys. The *sartha* required provision of enough food and water (in case of passing through deserts) for calculated number of months, of course their main halts gave them relief where they could fulfil the shortage of required provisions.

Caravans were equidistant to all the different political powers and received respect from different administrations. The political powers within their borders provided the protection from robbers and wild animals, large caravans had their own defense system. They had their own defense system. They had their own army with the condition that in exceptional case a certain administrator required help, the *sarthavaha* should send the army of caravan to help him. The caravan system must have been as old as 3000 years. In the first millennium B.C.E this system was gradually developed and continued unabated up to Eighteenth century C.E.

Communication of the people and society

India also has been a country of pilgrimage (yatra) In spite of her unimaginable length and breadth the common people travelled from the holy centers situated on lofty peaks of mountains, the sources of holy rivers of Ganga, Yamuna and Brahmaputra in the north to the sacred *Teerthas* (holy places) situated on the shores of ocean in the south. The communication, though very difficult and often adventurous was never impossible. Culturally India always has been an integrated country in spite of the different sects, languages and even divided in numerous administrative units and political powers.

The system of trade routes was supplementary to the migration of people of the Indian society. Even when the Buddha Bhikshus and Jain *Sadhus*(monks) often travelled to preach, they travelled

along the then trade routes. Occasionally they accompanied the caravans for the long journey. The migration of Jain Sadhus and sramanas from Bihar in the north to Sravanabelgola in the south was not an exceptional case. In drought, famine and natural calamities interstate migration was common. We find hundreds of Buddhist caves situated along the ancient trade routes and near the wealthy commercial and industrial towns. The merchants all over India donated generously to the viharas where hundreds of Bauddha acharyas resided. The merchants and traders looked at the *sthaviras* (chief Bhikshu) as trust worthy and deposited their goods with them.

Busy ancient trade routes

Old Pali texts indicate some of the ancient trade routes in use at least 2500 years back. The caravan of the merchant prince Anathapindika going southeast from Sravasti to Rajagriha passed along the foot of the hills up to Kushinara. The route from Sravasti to Rajagriha had twelve halts including one at Vaishali, with only a single crossing of the river Ganga. Another route led from Sravasti southwest to Paithan with six intermediate halts and frequent crossing of rivers. A third route led westward to Sindh the home of horses and asses and to *Sauvir* (Saurashtra) and its seaports. The then old grand trunk road leading from Rajagriha the capital of Magadha through Banaras, Saket and Sravasti towards Takshasila and the frontiers linking India with central and western Asia. This distance was over 18 hundred kilometers.

Apart from these arterial routes, the whole country was connected by a network of roads, some of which at any rate had milestones to indicate distances, Amenities were provided for travellers in the shape of shady trees, rest houses and wells on the roadside. The means of conveyance included litter, sedan chair, bullock carts and horse carriages. Rich people rode on elephants.

Common people used camels, horses and asses. The king, princes and wealthy people used chariots.

The Mahabharata gives an account of the roadways, it refers to *Uttarpatha*, the northern highway which linked the territory of Kirat, Kamboj, Gandhara and Yavana. Many roads lead to *Dakshinapatha*, the high way to south India passing through the city of Avanti and Rikshavati. This road led to Vidarbha and other to Kosala. It linked the different states such as Andhra, Guha, Pulinda, Shabara, Madraka etc. of south India. The roads were in better condition during the period of Mahajanapadas in the north. The network of Dakshinapatha was also remarkable. Almost all the flourishing ports were linked with the Inland commercial centers. The merchants from Kalingapptanam, could go to Bharukachcha (Broach) in Gujarat. It was the central highway. With the consolidation of the Mauryan empire, almost all the important cities of political and economic significance were linked by state high ways and national highways.

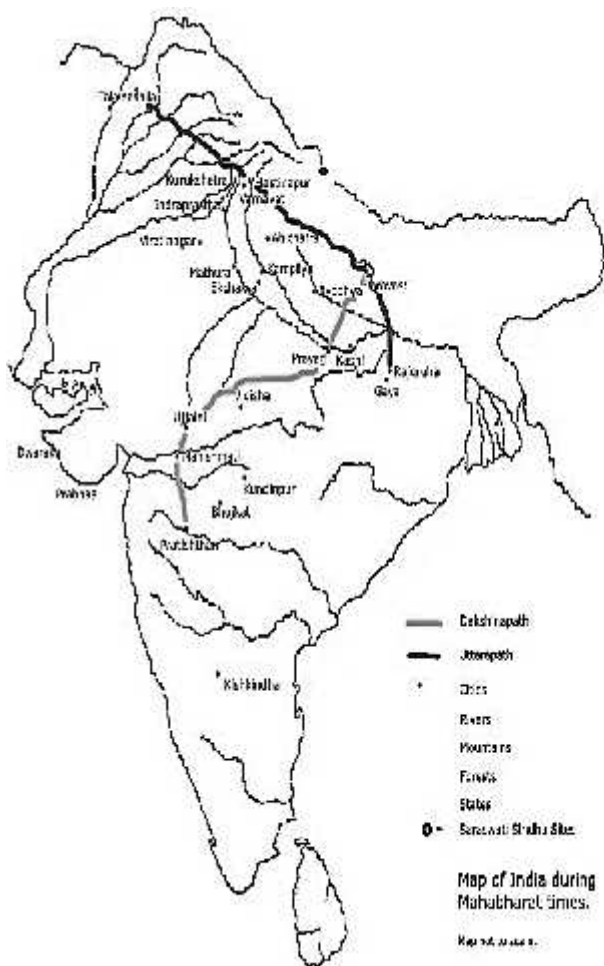


Figure 6. Ancient Indian trade routes

There was a systematic management for the trade routes and *mahamargas*. These routes were the important veins of the national life as well as the daily life of the society in general. India

was second to none in the world with regard to cotton industry, iron and luxurious goods. Inland trade routes were the vital part of *Suvarnabhumi*. The traders and merchants moving all over India on land and outside India.

Medieval India: Towns, Traders and Craft.

There were administrative centres, temple towns, as well as centres of commercial activities and craft production during medieval periods. The best example is Thanjavur. During the reign of Chola Dynasty (King Rajaraja Chola), its capital was Thanjavur. Besides the famous Rajarajeswara temple, there were palaces with mandapas or pavilions. where kings hold court here and issue order to subordinates. The *Saliya* weavers of Thanjavur and the nearby town of Uraiyur were busy producing cloth for flags to be used in the temple festival, fine cottons for the king and nobility and coarse cotton for the masses.

Temple Towns and Pilgrimage Centres

Thanjavur is also an example of a temple town. Temple towns represent a very important pattern of urbanisation, the process by which cities develop. Towns emerged around temples such as those of Bhillasvamin (Bhilsa or Vidisha in Madhya Pradesh), and Somnath in Gujarat. Other important temple towns included Kanchipuram and Madurai in Tamil Nadu, and Tirupati in Andhra Pradesh. pilgrimage centres also slowly developed into townships. Vrindavan (Uttar Pradesh) and Tiruvannamalai (Tamil Nadu) are examples of two such towns.

Small towns

From the 8th century onwards, the subcontinent was dotted with several small towns. These probably emerged from large villages. They usually had a *mandapika* (or mandi of later times) to which

nearby villagers brought their produce to sell. They also had market streets called *hatta* (haat of later times) lined with shops.

Usually a *samanta* or, in later times, a zamindar built a fortified palace in or near these towns. They levied taxes on traders, artisans and articles of trade and sometimes “donated” the “right” to collect these taxes to local temples.

Traders

There were many kinds of traders including Banjaras. Since traders had to pass through many kingdoms and forests, they usually travelled in caravans and formed guilds [associations for certain tasks] to protect their interests. *Manigramam* and *Nanadesi* were two such guilds. These guilds traded extensively both within the peninsula and with Southeast Asia and China.

The towns on the west coast were home to Arab, Persian, Chinese, Jewish and Syrian Christian traders. At the same time Kabul [Afghanistan] became politically and commercially important from the 16th century onwards. Trade in horses was primarily carried here. Slaves were also brought here for sale.

Craft persons

The craft persons of Bidar were so famous for their inlay work in copper and silver that it came to be called *Bidri*. The *Panchalas* or **Vishwakarma** community, consisting of goldsmiths, bronze smiths, blacksmiths, masons and carpenters, were essential to the building of temples. They also played an important role in the construction of palaces, big buildings, tanks and reservoirs. Similarly, weavers such as the *Saliyar* or *Kaikkolars* emerged as prosperous communities, making donations to temples. Some aspects of cloth making like cotton cleaning, spinning and dyeing became specialised and independent crafts.

Surat, Hampi and Masulipattanam were the major towns in India during the medieval period.

Hampi

Located in the Krishna-Tungabhadra basin, Hampi was the nucleus of the Vijayanagara Empire. No mortar or cementing agent was used in the construction of fortified walls and the technique followed was to



Figure 7. Markets of Hampi

wedge them together by interlocking. It got splendid arches, domes and pillared halls with niches for holding sculptures. During 15th and 16th centuries, Hampi bustled with commercial and cultural activities. Moors (a name used collectively for Muslim merchants), *Chettis* and agents of European traders such as the Portuguese, thronged the markets of Hampi. Temples were the hub of cultural activities and devadasis (temple dancers) performed before the deity, royalty and masses in the many pillared halls in the Virupaksha (a form of Shiva) temple. Hampi fell into ruin following the defeat of Vijayanagara in 1565 by the Decani Sultans – the rulers of Golconda, Bijapur, Ahmednagar, Berar and Bidar.

Surat

It was an emporium of western trade during the Mughal period along with Cambay (present Khambhat). Surat was the gateway for trade with West Asia via the Gulf of Ormuz. Surat has also been called the gate to Mecca because many pilgrim ships set sail from here. In the 17th century the Portuguese, Dutch and English had their factories and warehouses at Surat. The textiles of Surat were famous for their gold lace borders (*zari*) and had a market in West Asia, Africa and Europe.

The reasons for the decline of Surat were the loss of markets and productivity, control of the sea routes by the Portuguese, competition from Bombay where the English East India Company shifted its headquarters in 1668.

Masulipattanam

It lays on the delta of the Krishna river. Both the Dutch and English East India Companies attempted to control Masulipattanam. The fort at Masulipattanam was built by the Dutch. The Qutab Shahi rulers of Golconda imposed royal monopolies on the sale of textiles, spices and other items to prevent the trade passing completely into the hands of the various East India Companies. In 1686-1687 Mughal Emperor Aurangzeb annexed Golconda. So European Companies took alternatives to Bombay, Calcutta and Madras which lost Masulipattanam's glory.

India is a land of great variety of natural vegetations. Himalayan heights are marked with temperate vegetation; the Western Ghats and the Andaman Nicobar Islands have tropical rain forests, the deltaic regions have tropical forests and mangroves; the desert and semi desert areas of Rajasthan are known for *cactii*, a wide variety of bushes and thorny vegetation. Depending upon the

variations in the climate and the soil, the vegetation of India changes from one region to another. On the basis of certain common features such as predominant vegetation type and climatic regions, Indian forests can be divided into the following groups:

EARLY MARITIME CONTACTS

Conventional studies have tended to categorize maritime trade in the Indian Ocean in the pre-colonial period into ethnic networks, such as Roman trade, Arab trade, and European trade in the western Indian Ocean, as well as Indian trade across the Bay of Bengal. The basis for these identities was inevitably the nature of sources available. For example, the first century C.E. text, the *Periplus Maris Erythraei* (Periplus of the Erythraen Sea) provides the most comprehensive account of trade and trading commodities between the Red Sea and the west coast of India. The text itself nowhere refers to "Roman trade," though it does mention a diverse range of communities involved, including the *Ichthyophagoi*, or coastal fishing communities, the Nabateans, Sabaeans, Homerites, Arabs, and Indians. Nevertheless, in historical writing, references to Roman trade supplying the markets of the Empire with luxury items such as Indian muslin continue.

Contrary to such assumptions, the archaeological data indicate that the initial stages of the maritime system in South Asia may be traced to around 10,000 B.C., when fishing and sailing communities settled in coastal areas and exploited a diverse range of marine resources. These communities formed the bedrock of maritime travel and often combined fishing with trading ventures, especially in regions such as Gujarat, where fishing grounds are located at some distance from the coast.

By the third millennium B.C.E., these local and regional fishing and sailing circuits had evolved into trade networks between the Harappan settlements on the *Makran* and Gujarat coasts of the subcontinent and the Persian Gulf, as evident from finds of Harappan ceramics and seals at sites in the Gulf. A triad of names that figures consistently in Mesopotamian texts of the third to second millennium B.C. includes those of Dilmun (the Bahrain archipelago), *Magan* (the Oman peninsula) and *Melukkha* (identified with the Harappan settlements). Around the beginning of the Common Era, this network had expanded to include large parts of the western Indian Ocean extending from the Red Sea to the east coast of India, as described in the *Periplus Maris Erythraei*.

Ptolemy, the Greek Geographer mentions the trading centres in the hinterlands that existed in South India in the Second century C.E. He is the book, *Geography*, which is a thorough discussion on maps and the geographic knowledge of the Greco- Roman world.

Strabo, the Roman writer and geographer and the author of 'Geography' written in 21 C.E. has made detailed references about the eastern trade of the Roman Empire. His book presents a descriptive history of people and places from different regions of the world known during his life time.

Pliny's *Natural History*, written in 77 C.E., mentions about the important places of trade in South India. He attempted to document all known facts about the natural world.

A corresponding network extended across the Bay of Bengal to incorporate large parts of island and mainland Southeast Asia. However, the distribution of a range of ceramics such as the rouletted ware, a fine textured pottery with rouletted decoration,

at archaeological sites from lower Bengal to Sri Lanka, the north coasts of Java and Bali, and as far as Vietnam indicates several regional and transoceanic circuits.

The Sassanians ruled Iran and adjacent countries from C.E. 226 to 651 and were active participants in the trade of the Indian Ocean, with Siraf, located in the Persian Gulf, an important centre of trade. After a break in settlement, Siraf re-emerged as a major center around C.E. 700 and, together with Sohar, its location close to the mouth of the Gulf on the coast of Oman enabled it to participate in a regional trade network in the ninth to eleventh centuries C.E. that extended to settlements in the Indus delta, such as Banbhore, several centres along the west coast of India, and Mantai on the north coast of Sri Lanka. One of the characteristic features of maritime trade from the 9th and 10th centuries onward was the location of markets in fortified settlements along the Indian Ocean littoral, as in the interior. Rules governing the payment of taxes and regulating the functioning of the markets were often inscribed on copper plates and provide useful insights into the organization of the trade network.

Trade and Exchange

The commodities involved in maritime trade in the Indian Ocean may be divided into various broad categories, such as aromatics, medicines, dyes and spices; foodstuffs, wood, and textiles; gems and ornaments; metals; and plant and animal products. These categories find mention in a range of textual sources from the first-century *Periplus Maris Erythraei* to the Geniza documents of the eleventh to thirteenth centuries, Chinese accounts, and medieval Arab writings.

Textiles were a major commodity involved in the Indian Ocean trade and included a wide range, from coarse cottons to fine silks

and from dyed cloth to embroidered material. Furniture in Asia consisted mostly of various types of carpets, cushions, canopies and draperies - all produced by the textile industry. The value attributed to these varied not only temporally but also spatially in the different regions of the Indian Ocean littoral. It is suggested that textiles in Southeast Asia were recognized as a means of storing wealth, whereas in India domestic surplus income was traditionally stored in the form of gold and silver jewellery.

Gold, silver, and copper were the main traded metals, exchanged both as currency and bullion. Though sources of copper and lead are available in the subcontinent, the *Periplus* refers to the import of copper, tin, and lead to Kane, Barygaza, and Muziris on the west coast. This is repeated in the Geniza documents, which refer to trade in metals from south India and the regular export of iron and steel, brass, and bronze vessels. In return, copper, tin, and bronze vessels were imported into the south, where new ones were created and old ones repaired.

These commodities were exchanged through a complex diversity of transactions including gifts, barter, and trade. There are several references in the *Periplus* to presents given to the elite—for example, wine and grain in considerable quantity imported into the region of the Barbaroi in east Africa was "not for trade but as an expenditure for the good will of the Barbaroi." Similarly, in the region of Barygaza, or Bharuch, on the west coast of India, the king imported slave musicians, beautiful girls as concubines, fine wine, expensive clothing with no adornment, and choice unguent.

In addition to these gifts, the elite constantly tried to control trade. The *Periplus* refers to a customs officer and a centurion being dispatched to the harbour of Leuke Kome on the east coast of the Red Sea. The island of Socotra at the mouth of the Red Sea was

under the control of the king of the frankincense-bearing land, who had leased it out; the island was hence under guard. Somewhat later in the text, there is reference to the harbour of Moscha Limen in the region of Oman, where frankincense was guarded by some power of the gods.

Organization of Trade

In the early centuries of the Common Era, Buddhist texts and inscriptions recording donations at early Buddhist monastic sites provide data on the organization of trading activity into guilds, in addition to the presence of individual merchants. The state no doubt derived revenue from taxing trade transactions at entry points to cities and towns. From the middle of the first millennium C.E. there are several instances of these taxes being transferred to religious establishments. The charter of Vishnusena, dated to C.E. 592 from Lohata in the Gujarat-Kathiawar region, provides a detailed list of seventy-two trade regulations or customary laws to be followed by the "community of merchants" (*vanigrama*) established in the region. For example, it is specified that merchants staying away for a year were not required to pay an entrance fee on their return. Other clauses specify duties that were to be paid. A boat full of vessels had to pay twelve silver coins, but if the vessels were for a religious purpose, then it was only one and a quarter silver coins. In the case of a boat carrying paddy, it was half this amount. Other commodities mentioned as being carried on boats included dried ginger sticks and bamboo.

From the ninth to the mid-fourteenth centuries, two of the merchant guilds that dominated economic transactions in south India were the *Manigramam* and the *Ayyavole*. Associated with these two merchant guilds were associations of craftsmen such as weavers, basket makers, potters, and leather workers. Though these two guilds originated independently, from the mid-

thirteenth century onward, the *Ayyavole* association became so powerful that the *Manigramam* functioned in a subordinate capacity. Not only did these merchant associations develop powerful economic networks, they also employed private armies.

The range of their operations extended well beyond the boundaries of the Indian subcontinent into Southeast Asia. Several clusters of Tamil inscriptions have been found on the eastern fringes of the Indian Ocean from Burma to Sumatra. In contrast, the major states of Java and Bali reacted somewhat differently to the advent of Indian merchant groups. In the tenth century, local versions of these merchant guilds termed the *banigrama* appeared in the north coast ports of both the islands. While some foreign merchants may have been included in these groups, these appear largely as indigenous organizations associated with the local economic networks as tax-farmers.

Around the turn of the second millennium, there was increasing evidence of fortified settlements in coastal areas and of attempts by the state and religious institutions to localize the sale and exchange of goods, either within the fortified precincts or in the vicinity of a Hindu temple. The tenth-century Siyadoni inscription from Gujarat records donations made to a temple of the god Vishnu between 903 and 968 by merchants and artisans and the endowment of shops in the textile market, main market, and so on.

Along the Konkan coast, there are references to the fortified market center of Balipattana. The Kharepatan plates of Rattaraja, dated to C.E. 1008, lists gifts to the temple of Avvesvara built by Rattaraja's father and situated inside the fortifications. Also located within the fortifications were settlements of female attendants, oilmen, gardeners, potters and washer men, and also certain piece of land.

Farther south is the Piranmalai inscription of the thirteenth century from the Sokkanatha temple that was built like a fortress. The importance of the temple lay in its strategic location astride routes crossing the southern part of the peninsula from the Malabar coast to the east. The record lists a range of commodities on which a tax was levied for the benefit of the temple. These included cotton, yarn, thick cloth, thin cloth, and thread.

The establishment of fortified coastal settlements is matched by references to settlements across the Bay of Bengal. In one of his inscriptions dated C.E. 1025, Rajendra Chola enumerates thirteen port cities of island Southeast Asia and the Nicobar Islands, which were raided by the South Indian maritime force. This shows that the Chola navy had conquered parts of the Malay Peninsula and Sumatra.

Elaborately carved memorial stones have been found extensively in peninsular India, dating from the first to the twelfth centuries. These provide abundant information on the cult of the hero and are also significant indicators of sea battles, especially those from the region of Goa dating to the period of the Kadambas (950–1270). From the eleventh century onward, representations on memorial stones depict planked vessels, sharp-ended with a long projecting bow strongly raked, in addition to canoe-shaped craft.

In contrast to this emphasis on sea battles and aggression along the west coast are the iconographic illustrations from Orissa and Bengal. A ceremonial barge is prominently depicted on the eleventh-century Jagannatha temple at Puri on the Orissa coast, stressing the ritual and ceremonial aspects of the boat. It is evident that several networks overlapped in the Indian Ocean in the ancient period and brought together interest groups ranging from boat-building communities to religious functionaries, traders as well as armed groups.

ANCIENT AND MEDIEVAL INDIAN TECHNOLOGY

The Indus or the Harappan civilization (2350–1900 B.C.E. for its urban or Matured phase), which flourished in the northwest of the subcontinent, saw the rapid growth of an efficient agriculture that adapted itself to very diverse climates and conditions, from the water-rich Indus valley to semi-arid areas of today's Rajasthan. The Harappans grew wheat, barley and millets, and practised not only plough-based agriculture but also intercropping in places.

Their wheel-turned pots came in various shapes and sizes, and some were glazed and painted in addition. Metal smiths extracted copper from ore available in the Aravalli hills, Ambaji (Gujarat) or Oman, and, alloying with tin, produced bronze. Mixing (deliberately or accidentally) various impurities into it, such as nickel or arsenic, hardened it to the point where bronze tools could be used to dress stones. Harappans invented the true saw, with teeth and the adjoining part of the blade set alternatively from side to side, a type of saw unknown elsewhere until Roman times. They left us a few bronze figurines, which were cast by the - lost-wax process.

*Lost-wax process, also called **cire-perdue**, method of metal casting in which a molten metal is poured into a mold that has been created by means of a wax model. Once the mold is made, the wax model is melted and drained away.*

The Harappans also developed advanced grid-based town-planning, sanitation that collected used waters from individual bathrooms into municipal drains that were regularly inspected and cleaned. They realized that bricks of proportions 1:2: 4 (width equals two heights; length equals two widths) permitted alternating courses and therefore stronger walls. Baked or mud

bricks were not the only building material: at Dholavira (Gujarat), stone was also used on a huge scale. Harappan craftsmen used a number of minerals for ornamental, cosmetic and medicinal purposes; they excelled at bead-making, and their long beads of carnelian (a semiprecious stone), in particular, were highly prized in royal families of Mesopotamia. India's love for bangles is traceable to the Harappans' manufacture of large numbers of gold, bronze, conch shell, glazed faience or humble terracotta bangles.

Weavers used wheel-spun thread and, besides the widely-used cotton, evidence of silk has recently come to light at two sites. Other crafts included stone and ivory carving, carpet-making, or inlaid woodwork.

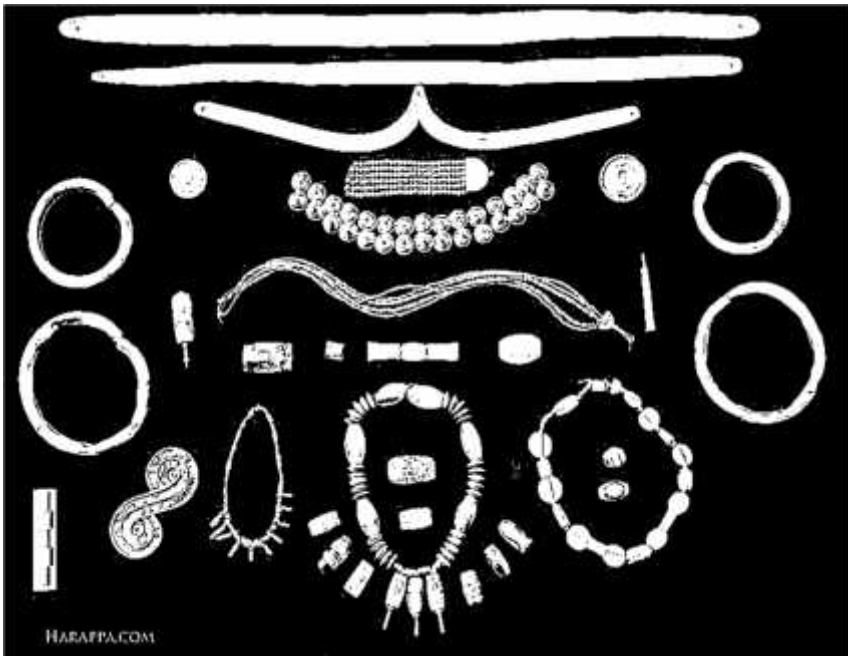


Figure 8. Harappan Jewellery

Later Pottery

After the Harappan age, innovations in pottery shifted to the Ganges valley. The Painted Grey Ware (PGW), late in the second millennium BCE, was associated with iron-based cultures. A few centuries later, from around 700 BCE onward, the Northern Black-Polished Ware (NBPW) was first found in today's Uttar Pradesh and Bihar and was associated with the emergence of cities in the Ganges valley. Both pottery types were produced on fast-spinning wheels using fine clay and fired to a high temperature in kilns under controlled conditions.

Other regions of India eventually developed many other types and styles of pottery and pot - sherds, which remain a major source of information for archaeologists, who have meticulously documented all those types and worked out their chronologies and regional spreads.

Metallurgy in the Post Harappan Period

As we have seen, the Indus civilization was essentially bronze-based, while the later Ganges civilization was iron-based. But it is now known that iron was produced in central parts of the Ganges valley right from 1800 B.C.E. Its use became widespread by about 1000 B.C.E, and the later Vedic texts mention dark metal (Krishna ayas or Shyama ayas), while the earliest text, the Rig-Veda refers only to *ayas*, which, it is now accepted, referred to copper or bronze.

Whether other parts of India learned iron technology from the Gangetic region or came up with it independently is not easy to figure out. What matters is that the dates for copper, bronze and iron in India correspond broadly with those in Asia Minor (modern Turkey) and Caucasus. Let us note that an old theory

according to which India learned iron metallurgy from those regions is now discredited.

Moreover, Indians invented two highly advanced types of iron. The wootz steel, produced first in south India from about 500 B.C.E, was iron carburized under controlled conditions. Exported from the Deccan all the way to Damascus, it was shaped there into swords renowned for their sharpness and toughness; later, the Arabs fashioned it into swords and other weapons. A Roman historian, Quintus Curtius, recorded that among the gifts which Alexander the Great received from Porus of Taxila (in 326 B.C.E), there was some two-and-a-half tons of wootz steel - clearly it was as highly prized as gold or jewels. The second advanced iron is the one used in the famous 1,500-year-old Delhi Iron Pillar, consisting of six tons of wrought iron (there are a few other such pillars in other parts of India). Its rust-resistant properties were only recently understood, and are due to the presence of phosphorus in the iron: together with iron and oxygen from the air, phosphorus forms a thin protective coating at the surface, which gets reconstituted if damaged by scratching. Indian iron-smiths would not have known the chemistry at play here, but it goes to their credit that through patient trial and error they were able to locate and process the right type of iron ore for such monumental pillars. The same technology was used to manufacture huge iron beams used in some temples of Odisha, such as Jagannath of Puri.

It is interesting to note that most of India's production of iron was controlled by specific communities, most of them from the lower rungs of Indian society. For instance, the Agarias of U.P. and M.P. are reputed metal workers, and there are other communities scattered across Jharkhand, Bihar, West-Bengal, Kerala and Tamil Nadu. In the late 1600s, shipments of tens of thousands of wootz ingots would leave the Coromandel coast for Persia every

year. India's iron and steel industry were intensive till the 18th century and declined mostly with the British selling their own products into India while imposing high duties on Indian products. Iron technology, however, did not put an end to the earlier bronze metallurgy. The two were used for different purposes. An eloquent testimony of the further growth of bronze metallurgy was found in a huge bronze statue of the Buddha made in Sultanganj (Bhagalpur district, Bihar), between 500 and 700 C.E.; at 2.3m high, 1m wide, and weighing over 500 kg, it is the largest bronze figure of its kind in the world, and was made by the same lost-wax technique that Harappans used three millenniums earlier (it is now at the Birmingham Museum). So were thousands of bronze statues made later in Tamil Nadu, such as the beautiful Nataraja statues. Similarly, highly polished bronze mirrors (*Aranmula Kannadi*) are still made in Kerala today, just as they were in Harappan times.

Chemistry and Alchemy

Although chemical practices were in use much earlier, a theory of chemistry took shape in the first centuries C.E., especially during the Gupta Empire. The discipline was variously called *Rasa shastra*, *Rasa vidya* or *Dhatu vada*. Its foundations were basically esoteric: rasa or mercury, one of the most important elements, was identified with the male principle (Shiva), while sulphur was associated with the female principle (Shakti). Transmuting base metals into gold and the pursuit of the elixir of life would today be categorized as alchemy more than chemistry. Its connection with concepts from Tantrism was not, however, devoid of practical applications, since Indian chemistry evolved practical methods to refine and produce medicines and other substances. The *Rasa shastra* texts discuss many chemical substances categorized as *maha rasas*, *upa rasas*, *nava ratnas*, *dhatu*s, poisons and plants, and also describe various types of apparatus,

which were ingeniously developed and used for processing these substances. A detailed study of these texts reveals how skilled the *Rasavadins* (chemists) were skilled in performing purificatory processes in order to remove the toxic effects of metals and minerals and make them fit for internal use. For instance, although mercury compounds are regarded as poisonous, cinnabar (mercuric sulphide) went through eighteen complex processes called *samskaras*, including rubbing with various medicinally efficacious plant juices and extracts, incorporation of sulphur, mica, certain alkaline substances, etc. The resulting mercury compound was then declared fit for consumption and believed to lead to the body's rejuvenation. Similar processes existed in Tamil alchemy and the Siddha system of medicine, which developed special techniques in connection with various naturally occurring salts.

Other technologies

The first appearance of glass in India goes back to the second half of the 2nd millennium B.C.E. The Bhir mound at Taxila (ancient Takshasila, now in northern Pakistan) yielded numerous glass beads of several shapes and colours dated to the 5th century B.C.E or so. Glass objects and ornaments have also come to light at places like Kopia, Ujjain, Nasik, Ahicchatra, Sravasti, Kolhapur, Kaundinya, Brahmagiri, and at several sites of Tamil Nadu (such as Arikamedu, Kodumanal and Porunthal). The early Indian glass-makers were skilled at controlling the temperature of fusion, moulding, annealing, blotching and gold-foiling, the last done in an exquisite manner. From antiquity this land has been renowned for the quality and dazzling variety of its production of textiles with fine skills in weaving and dyeing. The art of paper-making was introduced into India probably in the 11th century C.E., perhaps from China through Nepal. Before the introduction of paper, the ancient literature was preserved on palm-leaves in

south India and birch-bark in the north. By the latter half of the 15th century, Kashmir was producing paper of attractive quality from the pulps of rags and hemp, with lime and soda added to whiten the pulp. Sialkot, Zafarabad, Patna, Murshidabad, Ahmedabad, Aurangabad and Mysore were among the well-known centres of paper production.

Pyrotechnic Practices (or fireworks) appear to have been current in India in the 13th or 14th century. Gunpowder was an article of warfare at the beginning of the 16th century: the Indian craftsmen were quick to learn the technique from the Mughals and to evolve suitable explosive compositions. A 16th or 17th century Sanskrit treatise contains a description of how gunpowder can be prepared using saltpetre, sulphur and charcoal in different ratios for use in different types of guns. From the 16th century, rockets began being used in wars waged in India, as testified by military annals of the period.

The Mahrattas are reported to have fired rockets at the Third Battle of Panipat in 1761 C.E. which they lost to the Afghans. Hyder Ali, the 18th century ruler of Mysore, and his son and successor, Tipu Sultan, used rockets to great effect in the Anglo-Mysore Wars against the English East India Company, with a rocket corps of thousands of men. The rockets consisted of a tube of soft hammered iron about 20 cm long and 4 to 8 cm in diameter, closed at one end and strapped to a shaft of bamboo about 1 m long, with a sword often fitted at the other end. The iron tube contained well-packed black powder propellant. Though not very accurate, when fired en masse they could cause damage as well as panic among the troops. The British lost no time in taking a few rockets to England for closer study, which ended up boosting rocket technology in European warfare.

Cosmetics and Perfumes were the articles of trade with the Romans (along with textiles, spices and timber) and are described at some length in Var hamihira's *Brihat Samhita*: scented water for bathing, scented hair oil, perfume for cloths, for the mouth, scented tooth sticks are among the described items. This art became increasingly popular and some new compositions catered to the needs of the royal baths and religious ceremonies, particularly during the Mughal period. The *Ain-i-Akbari* speaks of the Regulations of the Perfume Office of Akbar; the *attar* of roses was a popular perfume, the discovery of which is attributed to the mother of Nur Jahan.

In many fields, especially metallurgy, India perfected advanced technologies centuries before Europe, which occasionally practised in reverse engineering, as in the case of wootz steel, zinc distillation, Sushruta's rhinoplasty and Tipu Sultan's rockets. Some of the ancient technologies remain useful even today: metallurgical techniques, ecological and agricultural traditions, Ayurveda and various local health traditions, water management among others. They are part of what has been called India's traditional knowledge systems. Even the technologies that have lost their relevance today remain interesting from a historical point of view. And there remains considerable scope for documenting, testing, assessing, and sometimes streamlining India's enormous traditional technological wealth.

MODULE -III

MIGRATIONS AND SPREAD OF SETTLEMENTS

Migration is movement of population involving a change of permanent residence of substantial duration. According to Multi-lingual Demographic Dictionary (p.113): “The distinguishing characteristic of migration is that it involves a change in usual place of residence and implies movement across an administrative boundary.”

If we consider the above-mentioned definitions, then migrants are those who leave their erstwhile residence and administrative area and move to another residence under a new administrative area. According to Census of India, when a person is enumerated in census at a different place than his / her place of birth, she / he is considered a migrant.

Migration involves mobility. But, can we term all forms of mobility as migration? The answer is, we cannot. There is a difference between migration and mobility. Mobility is more of a general term. It refers to all types of movements of people. It includes both permanent and temporary movements. While explaining migration, you should also know that what is not migration? We use terms like circulation, commuting and transhumance to indicate various forms of mobility. These terms cannot be categorized as migration in technical sense. Similarly, refugees and internally displaced persons are not migrants. Therefore, you must learn the meaning of each of these terms and their difference from migration.

Forms of Mobility and their Meaning

1. **Circulation** - It encompasses a variety of movements that are usually short term, repetitive or cyclical in character. The common feature of such movement is the lack of any declared intention of a permanent or long lasting change in residence. Example: Children leave for school in the morning, stay at day care centre in the afternoon and return home in the evening.
2. **Commuting** - It refers to the movement of individuals from their place of residence to place of work and back daily, weekly or monthly. Example: People coming from nearby villages and towns to major cities, namely Mumbai, Delhi, Kolkata, Chennai etc on a daily basis.
3. **Transhumance** - It refers to the seasonal movement of people up and down the hills along with their herds. Examples: Gaddis of Himachal Pradesh and Bakarwals of Jammu and Kashmir in India.
4. **Internally Displaced Persons** -These are the individuals or groups compelled to leave their homes to escape from situations like armed conflict, violence, human rights abuse or disaster. As the name suggests, they are residing within their country of nationality. Example: Kashmiri Pandits in India.
5. **Refugees** - Individuals or groups who, owing to fear of being persecuted for reasons of race, religion, nationality, membership in a particular group or political opinion, are outside the country of nationality and are unable or unwilling to return. Examples: Tibetans, *Chakmas* of Bangladesh, and Tamils of Sri Lanka staying in different parts of India.

Types of Migration

Migration may be forced, for example, the partition of India into India and Pakistan and movement of indentured labour from India to different British colonies. It could be permanent or temporary. For example, we are all permanent migrants! But the migration of labourers moving from Bihar and Eastern Uttar Pradesh to Punjab and Haryana to work in agricultural fields is seasonal, and so on. Therefore, you need to understand various types of migration.

Migration – Basis of Classification and Types

Basis Types of Migration

No	Basis	Types
1	Source or Origin	1) Immigration 2) Emigration
2	Choice	1) Forced 2) Voluntary
3	Political and Administrative Territory	1) Internal 2) International
4	Time	1) Seasonal or Temporary 2) Permanent
5	Distance	1) Short 2) Medium

		3) Long
6	Streams	1) Rural to Rural 2) Rural to Urban 3) Urban to Rural 4) Urban to Urban

Any particular event of migration can be classified differently on various bases. Let us take an example to explain this point. Labour migration from the states of Bihar, Jharkhand, Odisha and Uttar Pradesh to different parts of India. We can classify this on different bases as follows:

- On the basis of political and administrative territory, it is internal migration.
- On the basis of time, most labour migration is seasonal.
- On the basis of distance, it is long distance migration.

These classifications have to be understood clearly and properly and let us discuss briefly each type of migration;

1. **Emigration and Immigration:** A person who moves out of one's own country to settle in another is known as emigrant. A person who moves into a country where she or he is not a native to take up residence is known as immigrant. Let us explain this with an example. For example, if you move out of India and take up residence in USA, then you are an emigrant for India and an immigrant for USA. The process of moving out of one's own country is known as emigration and moving into another country for residence is known as immigration, respectively.

2. **Forced and Voluntary Migration:** People can either choose to move or be forced to move. When a government forces a large group of people out of a region, usually based on ethnicity or religion, it is known as involuntary or forced migration. Contrary to this, if person moves out of a region based on his or her choice, it is known as voluntary migration. Jews migration from Germany during World war is an example of forced migration. Migration of engineers and doctors from India to USA, Canada and West European countries is an example of voluntary migration.
3. **Internal and International:** When people migrate within the same country, it is called internal migration. When migration involves crossing the boundary of a given country, it is called international migration. For example, if a person migrates from Chennai to Mumbai, it is internal migration. On the other hand, if a person migrates from Chennai to Singapore, it is international migration.
4. **Seasonal or Temporary and Permanent:** The process of migration for a given period of time is known as seasonal or temporary migration. As mentioned above, labour migration from the state of Bihar, Jharkhand, Odisha and Uttar Pradesh to different parts of India is an example of seasonal migration. This seasonal migration is mainly in search of jobs in the agricultural and industrial sectors of states like Punjab, Haryana, Gujarat, Maharashtra etc. On the other hand, when a person decides to settle permanently in a different place than his/her place of birth, it is permanent migration.
5. **Short, Medium and Long-Distance Migration:** As the name suggests, this classification is based on distance. We explain below the classification given by the Census of India. It not only involves distance but also certain administrative

jurisdiction where the actual distance is not exactly reflected according to its category.

- a) **Short Distance Migration:** In India, short distance migrants are those migrants who move out to areas under different police stations but within the same district. Majority of Rural to Rural migration in India belongs to this category. However, this can happen in the urban areas also. For example, if a migrant moves out to a different area within the same city which falls under a different police station. It is also categorized as short distance migration.

- b) **Medium Distance Migration:** When the migrants move out to areas under different districts but within the same state, migration is classified as medium distance migration. For example, consider migration to a nearby village even at a distance of a few kilometers. If that village falls under the administrative jurisdiction of another district, the migration will be categorized as medium distance migration. As mentioned in the beginning, this is the case where actual distance is not considered as a criterion.

- c) **Long Distance Migration:** In the case of long-distance migration, the movement can be between two states within a country. In this case it is internal migration. If it is between two different countries it is international migration. Note that, short and medium distance migration is basically internal migration. However, long distance migration can be both internal and international migration. For example, migration of agricultural labour from Bihar and Uttar Pradesh to Punjab and Haryana is an example of internal long-distance migration. But, migration of skilled and semi-skilled labour force from the state of Kerala to Middle East

Asian countries is an example of long-distance international migration.

6. **Streams of Migration:** We define this type of migration as per the Census of India. This refers to movement of people from a common area of origin to a common area of destination. In other words, it represents the direction of movement of population from the places of origin to the places of destination. In such situations, the migration within a political jurisdiction of a country generates four main streams of migration:
- Rural - Rural migration
 - Rural - Urban migration
 - Urban - Urban migration
 - Urban - Rural migration

Determinants of Migration

The Determinants of Migration are generally classified into Four broad categories; Economic Factors, Social Factors, Demographic Factors and Environmental Factors.

a) Economic Factors

It is a fact that economic factors play an important role in the movement of population. The volume and the direction of migration depend on the economic conditions. For example, in a developing country, the availability of agricultural land and the size of landholdings may induce migration. Farmers with low land holding or landless villagers tend to migrate to other villages or cities to earn their livelihood. The depressed economic conditions of the people and their state of poverty lead to out-

migration. The economic prosperity and the consequent high employment potential leads to in-migration. In developing countries, like India, agricultural development is progressing fast. These factors induce people to migrate to the agriculturally developed areas such as the state of Punjab and Haryana, which have a high demand for labour. This demand for labour is fulfilled with cheap labour from the states of Uttar Pradesh and Bihar. The availability of better means of transport and communication also encourage people to migrate to longer distances. For example, we find labour from Odisha, Bihar in Tamil Nadu and Kerala.

b) Social Factors

Women move out from their parental home to the place of residence of their spouses after marriage. Hence, marriage is one of the major social factors for migration in India. Can you think about any other social factors? Yes, social factors that play significant role apart from marriage are socio-economic status, information network, cultural contacts, and desire for social uplift.

In India, people in a low socio-economic stratum are more mobile as they have no landed property to bind them to their native places. There is overwhelming evidence to show that the better educated, more skilled and economically better-off people also have a tendency to migrate. This does not mean that all high-status groups would migrate. For example, doctors, engineers, lawyers, architects and teachers who are already established do not move easily. Similarly, the communities that have strong ties with the family follow ancient tradition and customs do not move easily.

Public policies seek to increase or limit migration through schemes which encourage people to move, or through barriers

that restrict mobility. These policies may be directed towards the internal migration or emigration of those within a particular state's borders, or towards the immigration of foreign nationals. Some of the examples are shifting of people in the erstwhile USSR to sparsely populated areas of Siberia region and from densely populated coastal areas of China to interior parts of China.

c) Demographic Factors

What do we mean by demographic factor? Yes, demographic factors are those socio-economic characteristics of a population expressed statistically such as age, sex, growth rate, education and income level, occupation etc. Now, can you correlate these factors with migration? Let us analyse some of the demographic factors and their associations with migration. For example, age of the migrant is an important demographic factor. Young people have a far greater desire to out-migrate than the elderly people. Why do they move? It is due to many factors like employment, education, improving quality of life etc. High rate of natural increase of population is another reason for out-migration. The growth rate of population, among other things, determines the extent of population pressure in a given geographical area. The movement of European population across the Atlantic is an example. This was due to the gap in the potential for economic development. In contemporary India, redistribution of population is partly related to disparities in regional development. As noted earlier, largescale out-migration from the thickly populated parts of Bihar and east Uttar Pradesh is largely due to the diminishing land resources in the native villages.

d) Environmental Factors

The environment affects the well-being of the population through the availability and stability of, and access to, ecosystem services, and through the occurrence of hazardous events. The availability of provisioning ecosystem services is particularly acute for economies dependent on agriculture, fisheries and forestry, which are predominant in rural parts of the developing world. Here a change in ecosystem services directly affects well-being and led to migration. This can happen in three ways:

- i. Sudden onset of hazard events, for example, floods, cyclones, landslides, volcanic eruptions, earthquakes and tsunamis etc.
- ii. Environmental degradation and/or slow onset hazard events, for example, drought.
- iii. Armed (environmental) conflict/violence, for example, conflict over shrinking natural resources.

Significant numbers of people are being displaced every year. Migration is but one of several possible responses to extreme events, and displacement is usually the option of last resort. Who leaves, who returns, and when they return depends on the underlying social, economic and political circumstances. Hence, environment affects migration in combination with the other three drivers.

Therefore, the drivers of migration do not act alone. For example, political drivers are most influential when they coexist and interact with economic drivers. Similarly, demographic drivers cannot be understood in isolation. It is difficult to disaggregate the effects of one set of drivers of migration entirely from those of other drivers. For example, the political drivers of migration

and displacement are often conceptualized as involving conflict. It is relatively rare for conflict to affect migration independently from other categories of drivers. There is a strong political economy of conflict, with economic factors influencing the course of conflict, and patterns of migration responding as much to the economic destruction that is often wreaked by conflict as to the conflict itself. Moreover, development policies can, through their focus on poverty reduction and sustainable livelihoods, ameliorate the causes of conflict and enhance security, understood at both a state and human level.

Consequences of Migration

It is pertinent to analyse the consequences of migration, for, consequences of migration bring about both qualitative and quantitative changes in the society. Negative as well as positive changes can also be discerned while evaluating the outcome of migration. As we have classified determinants of migration into four broad categories, similarly, we can also classify the consequences into four categories namely economic, social, demographic and environmental. If you keenly observe, you will find that both the source regions as well as destinations undergo quantitative and qualitative changes. By quantitative change we mean that the change in demographic attributes like numbers, density, growth, compositions like age, sex, occupation, literacy etc. Similarly, qualitative aspects include adaptation in the new environment, effects on quality of life etc.

1. Economic Consequences

There are positive as well as negative economic consequences of migrations. Major positive consequence is the remittances sent by migrants to their homes help in the growth of economy of the region. This money is mainly used by the family for repayment

of debts, medical treatment, marriages, children's education, purchasing agricultural inputs, construction of houses, etc. Similarly, remittances from the Indian migrants staying outside the country are one of the major sources of foreign exchange in India. States such as Punjab, Kerala and Tamil Nadu receive very large amount of money from their family members who stays out of the country. Similar situation happens within the country also. Migration of people from Uttar Pradesh, Bihar, to the rural areas of Punjab, Haryana, has resulted in the success of green revolution and agricultural development in Punjab and Haryana. They also form major workforce in different industries in different parts of the country.

However, there are some negative consequences as well. Some of the negative consequences are as follows:

- i) Unregulated migration to the metropolitan cities of India has caused overcrowding and put severe stress on existing infrastructure. As a result of this, the number of population in slums is increasing in major cities like Mumbai, Delhi, Kolkata, Chennai etc. These migrants have to live in hazardous and unhygienic circumstances, without proper housing, livelihood and sanitation.
- ii) The under-development gets even worse due to out-migration of skilled and working population. Villages in underdeveloped parts of India are left with old and young age group population or females looking after these dependant family members.

2. Social Consequences

Like economic consequences, social consequences of migration can be categorized as positive and negative. Some of the positive consequences are as follows:

- a) Migrants act as agents of social change. The new ideas related to new technologies, family planning, girl's education, etc. get spread from urban to rural areas through them.
- b) Migration also leads to intermixing of people from diverse cultures and results in the evolution of composite culture.
- c) The mind-set of people changes. They start thinking broadly. New ideas and ideologies tend to infiltrate into the thinking of the people.

Like economic consequences, social consequences have some negative impacts also. Some of the negative consequences are as follows:

1. It also causes anonymity, which creates social vacuum and sense of dejection among individuals.
2. Continued feeling of dejection may motivate people to fall in the trap of antisocial activities like theft, crime and drug abuse.
3. Migration affects women folk more. In the rural areas, males move to out migration leaving their wives behind put extra physical as well mental pressure on the women which increases their vulnerability.

3. Demographic Consequences

Like economic and social consequences, demographic consequences have both positive as well as negative sides. Some of the positive consequences of demographic consequences of migrations are as follows:

- i. Migration leads to the redistribution of the population within a country.
- ii. Rural-urban migration is one of the important factors contributing to the population growth of cities.

Some of the negative consequences are as follows:

1. It results in imbalances in sex composition due to selective male migration. Large cities have adverse sex ratio as compared to rural areas due to high male immigration.
2. Rural areas face shortage of skilled people because most of skilled and semi-skilled people migrate to urban areas.

4. Environmental Consequences

Out of the four causes and consequences discussed in the unit, environmental consequences are of recent origin and emerging as one of the major challenges for the society. Some of the environmental consequences of migrations are as follows:

- i. Overcrowding of people due to rural-urban migration, has put pressure on the existing social and physical infrastructure in the urban areas.
- ii. This ultimately leads to unplanned growth of urban settlements and formation of slums shanty colonies.
- iii. Apart from this, due to over-exploitation of natural resources, cities are facing acute problem of depletion of ground water, air pollution, and disposal of sewage and management of solid wastes.

Spatial Patterns of International Migration

In India, if you visit Pondicherry, you will find French settlements. Similarly, in Goa you will find descendants of Portuguese. In Mumbai there are thousands of Jews and in Kolkata there is a township known as China Town. Have you ever thought how these people came to India? Why did they come to India? Some of them were explorers and traders. The French and Portuguese established their colonies in some parts while the entire Indian sub-continent remained colony of British Empire for about 200 years.

In fact, most of the Europeans travelled to different continents all over the world and established their colonies. Later on they brought mostly Asians and Africans to work as indentured labour in their colonies. That is how population was redistributed all over the world during the day of European imperialism.

In this section, we will have a detailed analysis of spatial patterns of international migration as it has its own global significance. Moreover, since internal migration varies from country to country, this has to be studied individually. As far as internal migration in India is concerned, we will have a detailed discussion in the course on Geography of India.

During the last five centuries, the world has undergone transfer of population in an unprecedented scale. However, this has now been restricted and the magnitude is very small in modern times. This is because of the conscious and concerted effort of all the countries of the world to regulate international migration. In this process, these countries have made their frontier as a barrier. As rightly pointed out by Beajeu-Garnier (1978, p.179), due to this restriction, international migration is of much smaller in

magnitude in the modern times and its spontaneous character tended to disappear.

International migration can be looked at in two different ways. One is in simple chronological manner and the second way of looking is in forced and voluntary migration separately. In this section, we will discuss the process in a chronological manner.

If we trace the history of migration in modern times, then the sea voyages carried out by the Europeans in 17th century and later for the overseas expansion might be termed as the first large scale overseas migration in modern times. This migration also helped particularly North-Western European nations in releasing population pressure on existing available resources of that time in those countries. If we look at the patterns of migration of that time, it has been observed that the migration took place in two distinct directions.

First stream of migration was towards the sparsely populated areas of tropical and sub-tropical coastlands which were easily accessible. Major attractions for these areas were the potentials for the production of tropical crops like tea, coffee, cotton, sugarcane, indigo and spices. As you know, these crops are labour intensive, cheap labour was the major requirement for extensive cultivation of these crops. Initially, the labour force was imported from Europe itself. But, in due course of time, as demand started growing, cheap labour was brought mostly from Africa in the form of slaves. It continued till the slavery was abolished in 19th century. This slave trade that uprooted millions of Africans from their home. After the abolition of slavery, European countries particularly British and Dutch started exploiting their colonies in densely populated Asian countries. As a result, indentured labour were supplied to newly developed plantation agriculture areas in

Asia and Africa namely Sri Lanka, Fiji, Malaysia, Indonesia, East Africa, Mauritius etc.

The exact number of slaves deported during these three hundred years is exactly not known. Rough estimate varies from 10 to 30 million. Out of these, about half of the Africans were sent to the Caribbean Islands, about 45 percent to Central and South America and the rest 5 percent to the United States. If you closely analyse this slave trade, then you will find a pattern, which is popularly known as 'triangular slave trade' (Fig. 11.2). At first stage, British ships carried slaves and gold from Africa to the Caribbean Islands. In the next stage, the same ships carried molasses, sugar and gold coin from the Caribbean to North American colonies. In the last and final stage, the ships returned to Africa with iron bars, used as currency in Africa, and rum.

The second stream of migration was towards sparsely populated temperate grassland areas. These areas were temperate zones of Americas, South Africa, Australia and New Zealand. These areas used to be very sparsely populated before European settlements and the ensuing migration of various groups of people. It is being said that this is one of the important migratory movement that involved about one-fifth of Europe's total population (Jones, 1981, p.254). It has been observed that initially few people wanted to move to these wild areas because the population pressure was not so acute in Europe before 19th Century. The migration in large proportion became a reality only in between 1820 to 1930.

Therefore, we can conclude that major human migration can be grouped under two categories:

- i. The first major stream of migration was exclusively by Europeans; and

- ii. The second stream of migration was by Africans and Asians generated by European intervention for their colonial interest.

It is a fact that large scale forced migration occurred between the Two World Wars. The Two Wars dislocated people, and almost all the communities were uprooted on the basis of religion, ethnicity etc. Some of the examples of forced migration were the movement of Jews from Germany, Palestinian refugees to the Arab countries after the creation of Israel, and movement of people on both sides after partition of India in to India and Pakistan. Similarly, it has been estimated that over one million Russians were found stranded in the adjacent part of Europe as a result of 1917 revolution. About 18 million people in central and Eastern Europe crossed international frontiers through flight, explosion, transfer or exchange of population in three years following the World War II.

In Asia, the Post War period witnessed the independence of many countries from colonial rule. As you know, India was divided in to two independent nations-India and Pakistan- in the year 1947. During this period, nearly 17 million population migrated from one part of the sub-continent to another.

Similarly, the creation of an independent state of Israel in West Asia brought thousands of Israelis from all over the world into one nation and thousands of Arabs forced to leave the country due to Arab-Israeli conflicts.

The following chart shows the name of top 10 nations that involved in the process of the migration of the people;

The Top Ten Countries that Receive Immigrants and send emigrants

Sr. No.	The top ten countries that receive immigrants	The top ten countries that send emigrants
1	United States	India
2	Russian Federation	Mexico
3	Germany	Russian Federation
4	Saudi Arabia	China
5	United Arab Emirates	Bangladesh
6	United Kingdom	Pakistan
7	France	Ukraine
8	Canada	Philippines
9	Australia	Afghanistan
10	Afghanistan	United Kingdom

Source: Department of Economic and Social Affairs, United Nations, 2013.

EFFECTS OF GLOBALISATION

The word Globalisation has no commonly accepted meaning. Globalisation generally refers an expansion beyond national borders, of all aspects of human life and culture, particularly of business, science and technology. It means an increasing integration of different national economies and societies. It puts

an end to the isolation of the nations through the powerful means of communication and electronic media like Television, Internet, Satellite and so on. In short, it aims to establish a borderless society.

The two terms generally used with globalisation are 'Planetary' and 'Global Village'. It is argued that in the Planetary age, citizens are becoming citizens of the entire globe than of a particular nation. It is Marshall McLuhan, in his book published in 1964 that he described the world as 'Global Village'.



As the outcome of the world Capitalist

system, more particularly Financial Capitalism and Neo Imperialism, globalisation incorporates liberalisation, privatisation and free market economy to serve and suit the interests of capital. It also stands for commercialisation, capitalisation, internationalisation, trans-nationalisation and financialisation. Globalisation tends to erode the sovereignty and autonomy of the nation state and that international migration has become an integral part of globalisation.

In the case of migration, globalisation has been affecting far reaching changes all over the world. Globalisation has made migration much easier through better means of communications, dissemination of information through mass media and improved transport, among others. It is the increasing trade and investment flows in many regions, which facilitated interest in migration. For many, international migration has become global, in so far as globalisation means greater circulation of goods, people and capital and also greater velocity in world politics. Globalisation has transformed the nature of international migration both qualitatively and quantitatively. It has triggered greater mobility and there are qualitative changes in migration dynamics brought forward by the diversity of regions and people now involved in the process of migration. Globalisation continues as an important driver for migration that has become international in character and pattern. It is marked by the capitalist strategy of colonising the mind, thinking and ideas of the people. This ‘internal and intellectual colonisation’ is primarily achieved through the Media, especially the e-media.

Globalisation has also increased economic disparities between nations. Some theorists and scholars have argued that globalisation also reduces migration. Growth in trade can reduce migration through the creation of additional employment and higher growth in labour sending countries. It is argued that flows of goods and capital between rich and poor countries will not be large enough to offset the needs for employment in poorer countries.

Globalisation more or less contributes to higher trafficking and smuggling of persons across borders with the proliferation of transnationals crime syndicates. It also increased trade in services. The increased tradability of skill and knowledge – intensive services opens up new opportunities for high wage jobs

in the migrant sending countries, and can be expected to induce skilled workers to stay in their home country.

It also leads to the over exploitation of nature and its resources in a big way. In the name of development, nature and the mother earth have been brutally exploited and attacked. This has resulted in some cases, to the use of eco fragile and other vulnerable regions, resulting in natural calamities and disasters. This has led to the rise of Ecological movements to check and block these onslaughts and activities against nature and to sustain the nature and hence earth.

Globalisation is a reality. It will continue to stay and there is no running away from it. No nation, or economy or society can remain uninfluenced by the rest of the world, especially in terms of the flow of ideas, application and impact of technology, to name a few.

MODULE: IV

THE GREAT TRIGONOMETRICAL SURVEY OF INDIA

Towards the end of the eighteenth century, the British administration in India increasingly came to understand the need of having complete geographical knowledge of the territories under its control. It was essential for them to run their revenue and administrative machinery effectively. Three main branches of land surveys conducted by the East India Company in India were;

- i. Revenue surveys
- ii. Topological Surveys and
- iii. Trigonometrical Surveys.

The East India Company compiled voluminous amount of data about the land and the people of the country through the above-mentioned surveys. After the fall of Mysore in 1799, the company official, Lord Wellesley felt the necessity of exploring and collecting information of the newly conquered territories in the South. Consequently, three methodical surveys were conducted simultaneously. Francis Buchanan started a general agricultural survey of Mysore and Malabar. Topographical and trigonometrical surveys were led respectively by Coilin Mackenzie and William Lambton.

Given the size of the territory under his disposal, William Lambton understood that only the geodetic surveys can produce the accurate maps of such large areas. He submitted his proposal for a Geographical and Mathematical Survey in 1799 and began

his work in 1802. From 1818 onwards his survey was officially named the Great Trigonometrical Survey.

During the period between 1802 and 1815, Colonel Lambton measured a large number of base lines with a network of triangles covering the country up to 18° latitude.

Triangulation also covered the territories from Goa to Masulipattanam, from Cape Comorin to the southern



boundary of the Nizam's and the Maratha possessions. The total area covered was 165,342 square miles. Georg Everest joined the Trigonometrical Survey in 1818.

After the death of Colonel Lambton in 1823, Everest became the Superintendent of the Great Trigonometrical Survey. Everest led the success further. He measured the Bedar base line to connect Bombay and the Great Arc from Cape Comorin to the Himalayan Mountains. He improved the methodology of surveying by introducing the use of luminous signals at night instead of flags and beacons on day and also by introducing the Gridiron system which replaced Lambton's laborious method of throwing a network of triangles. He became the Surveyor General in India in 1830 and was succeeded by Andrew Waugh in 1843.

Triangulation of a vast region between the Great Arc and Calcutta was completed by Waugh. He also measured the north-eastern Himalayan series and determined the heights of 79 Himalayan peaks and named the 15th peak as Mount Everest.

In 1861, the Offices of the Surveyor General and Superintendent of the Great Trigonometrical Surveys were separated and Colonel Thuillier and Colonel Walker took charge of the two offices respectively. By this time, the work of principal triangulation of the country was completed. The main work waiting for Walker was to determine the length and azimuth of the triangles and the latitudes and longitudes of different places.

In 1877 Colonel Walker became the Surveyor General of India and the three branches of surveys - topographical, trigonometrical and revenue- were merged together to form the Survey of India which in later years continued the triangulation work in the rest of the areas to cover the whole of India.

Methodology

The methods and modus operandi followed and applied by the officials and geographers of the Colonial administration deserve special mention. The programmes of these geographers greatly helped in understanding Indian topography and its nuances. Following are the important officials who were involved themselves in realising the exact nature of Indian Geography.

Colonel Lambton

Lambton was a geographer as well as a geodesist. He chose the geodesic method over the astronomic based survey for its accuracy. The East India Company was concerned about the economic aspect of the surveys as the geodesic surveys were costlier than the other. However, Lambton was successful to

convince his fellow scientists in the authority about the importance and scientific usefulness of the survey. The trigonometrical survey was universally recognised by Scientists in Europe "as the only trustworthy basis for extensive national surveys." Lambton combined both the surveys and it was only in 1818 that his survey was officially named the Great Trigonometrical Survey of India.

What is Geodesy?

Geodesy is the science of accurately measuring and understanding three fundamental properties of the Earth: its geometric shape, its orientation in space, and its gravity field as well as the changes of these properties with time.

During May to July 1804 a base line was measured at Bangalore; Lambton measured base lines during March 1806 at Coimbatore, in July 1808 at Tanjore and in February-March 1809 at Palamcottah. During April 1811 and March 1812, he measured two base lines - one at Gooty and another at Guntur. Again, during December 1814 and February 1815 two other base lines were measured respectively at Kumta and at Bedar. The total length of the base lines measured was 59.32 miles yielding an average of 5.93 miles covered in 257 days.

Between 1802 and 1815 Colonel Lambton covered the country up to 18° latitude with a network of triangles. Territories from Goa to Masulipattam and from Cape Comorin to the southern boundaries of Nizam's and Maratha possessions were covered by triangulation. The triangulation of Great Arc was extended to Takal Khera in 20°6' latitude. Further work was done to cover the greater part of the eastern territories of the Nizams by meridional

series and the work of longitudinal series from the Bedar base towards Bombay. The area covered by the trigonometrical operations during Colonel Lambton's time aggregated 165,342 square miles.

George Everest (1790-1866)

George Everest joined the Trigonometrical Survey in December 1818 and started triangulation of the eastern part of the Nizam's dominion, but was unable to complete it due to illness. He was given an independent assignment in October 1822 on a longitudinal series of the great triangles originating from Bedar base line to connect Bombay. After the death of Lambton in January 1823, he became the Superintendent of the Great Trigonometrical Survey of India and continued the programme of carrying out the survey of the Great Arc northwards in difficult tracts; but Everest had to take rest after terminating the Sironj base line on 24° latitude. Everest sailed for England in November 1825. During his stay there, he was able to contact scientists, instrument makers and officers of the Ordnance Survey of Great Britain. In 1830 he published the results of his observations made between 1823 and 1825 under the title of an account of the measurement of an arc of the meridian between the parallels of $20^{\circ}3'$ and $24^{\circ}7'$. In the period of his absence in India, Joseph Olliver continued the work of longitudinal series from Sironj to Calcutta along parallel 24° under instructions from Everest and completed it by July 1832.

Which instrument was used to measure India?

They used a theodolite, an instrument which weighed 50 kg, and a zenith sector to measure India.

The theodolite was used to measure vertical and horizontal angles on the land of triangulation. It was formed with finely calibrated micro meters, microscopes and spirit levels.

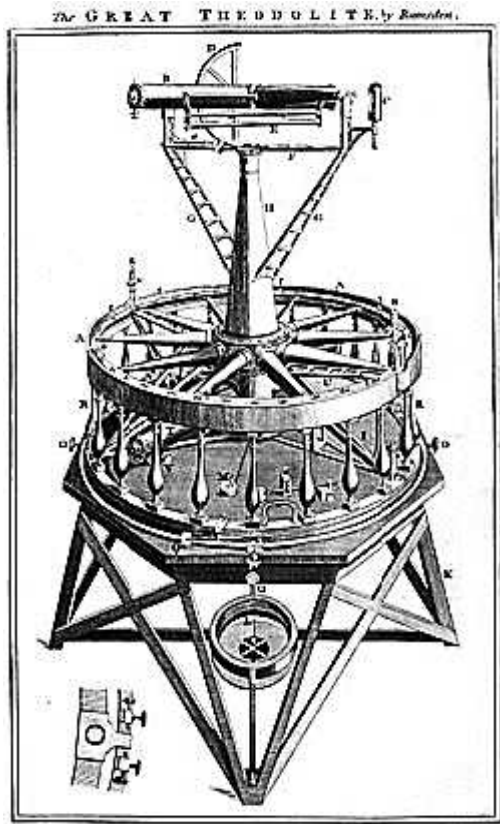
The zenith sector -- a telescope attached to a 5ft-long sector or tube that pointed straight up to the skies -- was used to determine the position of the stars relative to the land position and thereby calculate the length of a degree of latitude in miles.

Everest returned to India and took over as the Surveyor General in India in October 1830. He measured a base line of verification of the series completed by Olliver extending 6.5 miles along the Barrackpore Trunk Road between November 1831 and January 1832. The work on the Great Arc series was resumed by Everest in 1832 after a gap of seven years and continued without any interruption up to December 1841 and "closed with the measurement of the Bedar base line; and the whole Indian arc from Cape Comorin to the Himalayan Mountains, forming the main axis of Indian geography was thus completed." The area under the Great Arc operations, principal and secondary, aggregated 56,997 sq. miles with the measurement of three base lines. The rate of progress measured by the time taken is one third of that of Lambton but it is still considered unsurpassed at the global level because of the superior quality.

Among the technical achievements of Everest were the introduction of luminous signals, that is, the method "of observing to lights at night instead of to flags and beacons by day." Another achievement of Everest was the replacement of Lambton's system which was designed to throw a network of triangles over the whole country, with a new system. Everest thought that it was sufficient "to execute meridional series about a degree apart, tied together at their ends by longitudinal series. This is termed the Gridiron System and is analogous to the French and Russian methods." From the Calcutta longitudinal series, he accordingly planned to originate several meridional series to terminate at the foot of the Himalayas and eventually to be connected by another longitudinal series along the base of the mountains. Nine stations were selected on the Calcutta series as origins of as many meridional series. Two Indian associates of Everest deserve a special mention in his efforts. Radhanath Sikdar, a high-ranking mathematician contributed to the preparation of Auxiliary Tables, and Sayed Mir Mohsin Hussain, who was appointed as a mathematical instrument maker in 1839 in place of Henry Barrow. Everest was able to build up a great organisation, altered and revolutionised the old system and made substantial contribution to the science and geographical knowledge of India.

Andrew Waugh

In 1843, Andrew Waugh succeeded George Everest and completed triangulation of the region between the Great Arc Series and Calcutta and also the north-eastern Himalayan series. Under his leadership heights of 79 Himalayan peaks were determined and the 15th one was named by him as Mount Everest. In 1861 Sir Andrew Waugh retired and the offices of the Surveyor General and that of the Superintendent of the Great Trigonometrical Survey were again separated.



Used by the late Genl. Roy in the great English Trigonometrical Operations.

Colonel Walker and Colonel Thuillier

Figure 11. Great Theodolite by Jesse Ramsden, similar to the one made by William Cary that was used by Lambton in the early surveys

Colonel Walker was appointed as the Superintendent of the Great Trigonometrical Survey and Colonel Thuillier, the Surveyor General. The task before Colonel Walker was to determine the procedure by which the final values for the lengths and azimuths of the sides of the triangles and also for the latitudes and

longitudes of the stations might be ascertained as the principal triangulation of the country had already been completed. For this purpose, the principal triangulation of India was divided into five sections as it was not possible to operate on the whole. The two longitudinal chains of triangles were the dividing lines of these sections- one from Karachi to Calcutta and the other from Vizagapatam to Bombay and the Great Arc lying between the parallels of 18° and 30° .

The Central Chain executed by Major Lambton and George Everest, from Cape Comorin to the Himalayas was converted into a geodetic arc by taking astronomical observations of the latitude on several points. The arc has been used in the searches of the earth's figure. Further accurate triangulation was done on the east and west of this channel forming several other meridional chains which, with the latitudes of certain of their stations being astronomically determined, could become variable meridional arcs for geodesy. Extension of telegraph lines facilitated determination of the differences between the stations telegraphically. With new instruments, Colonel Walker succeeded in observing a large number of astronomical latitudes and differential longitudes. These data were used by the Ordnance Survey of Great Britain in the investigation of the earth's figure. Around 1877, after the retirement of General Thuillier, Colonel Walker became the Surveyor General of India and amalgamated the three main streams of survey - trigonometrical, topographical and revenue - into one, named as the Survey of India. Under the new organisation, the triangulation work continued mainly in areas still left out gradually to cover the whole of India.

CENSUS IN INDIA

A population Census is the process of enumerating, collecting, compiling, analysing and disseminating demographic, social,

cultural and economic data relating to all persons in the country, at a particular time, once in every ten years. Conducting population census in a country like India, with great diversity of physical features, is undisputedly the biggest administrative exercise. The wealth of information collected through census on houses, amenities available to the households, socio economic and cultural characteristics of the population makes Indian Census the richest and enormous and it is the only source for planners, research scholars, administrators and other data users. The planning and execution of Indian Census is challenging and fascinating.

India is one of the very few countries in the World, which has a proud history of holding Census after every ten years. The Indian Census has a very long history behind it. The earliest literature 'Rig Veda' reveals that some kind of Population count was maintained during 800-600 BC. Kautilya's *Arthashastra*, written around 321-296 B.C.E., laid stress on Census taking as a measure of State policy for purpose of taxation. *Ain-e-Akbari*, the work written by the court historian of Akbar, Abul Fazl speaks of the administration of Akbar, contains comprehensive data pertaining to population, industry, wealth and many other characteristics. In ancient Rome, too, census was conducted for purpose of taxation.

The history of Indian Census can be divided in two parts i.e. Pre independence era and Post-Independence era.

I. Pre-Independence Period

The History of Census began in 1800 when England had begun its Census but the population of dependencies was not known at that time. In its continuation, based on this methodology, census was conducted in the town of Allahabad in 1824 and in the city of Banaras in the year 1827-28 by James Prinsep. The first

complete census of an Indian city was conducted in 1830 by Henry Walter in Dacca. It was in this Census that the statistics of Population with sex and broad age group and also the houses with their amenities were collected. Second Census was conducted in 1836-37 by Fort St. George. In 1849 Government of India ordered Local Government to conduct quinquennial returns of population. As a result, a system of periodical stock taking of people was inaugurated in Madras which was continued till the imperial census was ordered. These returns were taken during the official years 1851-52, 1856-57, 1861-62 and 1866-67 respectively. The Census in North Western provinces took place in 1852, which was regular house to house numbering of all the people in the province at the night of 31st December 1852. The quinquennial Census of 1866-67 was merged in the imperial census of 1871.

The Home Affairs of the Government of India had desired, under Statistical Dispatch No.2 of July 23, 1856, that a general census of population might be taken in 1861, which was postponed in 1859 due to the mutinies. However, on 10th January, 1865 a census by an actual house to house enumeration was undertaken in North western provinces. A similar census was undertaken in November, 1866 in Central provinces and in 1867 in Berar. The Census in the Punjab territory was taken in January 1855 and 1868 respectively. The Census of Oudh was taken in 1869. In the cities of Madras, Bombay and Calcutta, census was taken in 1863, 1864 and 1866 respectively. An experimental census of lower provinces of Bengal was started in 1869, which was completed by H. Beverley, Registrar General. In 1865, the Government of India and Home Government had agreed in principle that a general population census would be taken in 1871. In the year 1866-67, census was undertaken by actual counting of heads in most parts of the country, which is known as the Census of 1872. This Census did not cover all territories possessed or controlled by the British. In this Census, a House Register was canvassed

with 17 questions. The information collected pertains to name, age, religion, caste or class, race or nationality, attending school /college and able to read and write. These common questions were asked and answers were collected separately from males and females. The question on occupation was canvassed for males only.

The Census of 1881, which was undertaken on 17th February, 1881 by W.C. Plowden, Census Commissioner of India, was a great step towards a modern synchronous census. Since then, censuses have been undertaken uninterruptedly once in every ten years. In this Census, the thrust of emphasis was not only on complete coverage but also on classification of demographic, economic and social characteristics. The census of 1881 was undertaken in whole parts of British India (except Kashmir) including those feudatory states politically associated with and supportive of the Government of British India. However, it did not include French and Portuguese colonial possessions. Meanwhile, a census of Portuguese colonial dominions in India was also undertaken at the same time as the British Indian Census. Hence, the British provinces viz, Bengal, North west Provinces, Madras, Bombay, Punjab, Assam, Baruch, Berar, Coorg and Ajmer besides Native states of Rajputana, Central India, the Nizam's dominions, Mysore, Baroda, Travancore and Cochin were included in the census of 1881. In the Census of 1881, a schedule known as 'Census Schedule' with 12 questions was canvassed. Deviating from the past censuses, a question on sex was introduced and the practice of canvassing same questions separately from males and females was dropped. New questions on marital status, mother tongue, place of birth and infirmities were included. The question on education was modified to the extent that for those who are not formally educated, it was ascertained that whether they were able to read and write. The

datum on Caste among the Hindus was ascertained and in other cases information on Sect was obtained.

The Second Census began on 26th February, 1891 almost on the same line and pattern with that of the 1881 census. In this Census, efforts were made cent percent to make it complete in all respects and the Upper part of present Burma, Kashmir and Sikkim were also brought under its ambit. This Census used the same schedule of the First Census which contains 14 questions. The questions on religion, caste, literacy, occupation etc were further modified. Thus, with regard to question on religion, information on main religion was obtained and information on sect was also collected. Questions on caste or race of the main religion and sub division of caste or race were also canvassed. The Census of 1891 replaced the previous Census' question on Mother Tongue with a question on Parental Tongue.

The Third Census, in the continuous series was started on 1st March, 1901. In this Census Baluchistan, Rajputana, Andaman Nicobar, Burma, Punjab and the remote areas of Kashmir were included and in respect of other areas, where detailed survey was not possible, population was estimated on the basis of houses. The census schedule of 1901 census contained 16 questions. The main change was that the provision for house number was made in the Schedule. The other changes effected in this Census were that information on caste was confined only to Hindus and Jains and in case of other religions, the name of tribe or race was recorded. In place of foreign language, a new question "Know or does not know English" was included. The question on mother/parental tongue, was modified to the extent 'Language ordinarily used'.

The Census of 1911 was commenced on 10th March, 1911 in all fourteen British Provinces and Native states. In this Census, the whole Empire of India i.e. territories administered by the

Government of India and mediatized Native states were covered with the exception of a few sparsely inhabited and unadministered tracts on the confines of Burma and Assam. The Census Schedule canvassed in this Census contained the same number of 16 questions but their scope was extended. In place of age, the question was asked “Age Completed last Birthday”. Along with the question on religion, sect of Christians was also ascertained. The particulars of district, province or country were asked in respect of the question on Birth Place. In 1901 a question ‘know or does not know English’ was asked but in the Census of 1911, this question was replaced by the question, “Whether Literate in English”?

The 1921 Census, the Fifth census in its continuous series was started on 18th March, 1921. In this Census, the whole territory known as the British Indian Empire was covered which includes the territories directly controlled by the Government of India generally known as British India and the Indian States consisting of areas administered by Indian chiefs, who were supportive of, and cordial with the Central Government or with one or other Provincial Government. Although, the Census schedule of 1921 contains the same questions like that of the Census of 1911, yet, these questions were slightly modified. The question on various Sects of Christians, which was asked in 1911 was dropped and the information on caste, tribe or race was collected from all irrespective of their religion.

The Sixth General Census of India commenced on February 26, 1931. The area covered in this census was approximately identical with that of the area covered by the Census of 1921. The 1931 Census coincided with the Civil Disobedience Movement, one of the significant events of the Indian National Movement. The Census Schedule of 1931 Census contains 18 questions instead of 16 questions of 1921 Census. The two new questions

added to the existing questions were- a) Earner or Dependent and b) Mother Tongue (which was asked only in the First Census of 1881). For eliciting information on second language, the question 'other language in common use' was retained. Again, the question on Sect was added with religion and age was ascertained in respect to the nearest birth day.

The Census of 1941 started under the adverse conditions of World War II. Till February 1940, Government was un-decided of whether to have a census or not. With concerted efforts, the enumeration was carried out directly into the slips which were later sorted out to generate tables. The idea of one-night enumeration was dropped in this census. The major innovation of 1941 Census was the use of Random Sample and every 50th slip was marked to list the validity of a sample in census. In place of Census Schedule, an Individual Slip, which contains 22 questions was added. The formation of questions was modified to a great extent, so as to elicit authentic and exact Data. Following were the new questions of the 1941 Census:

1. Number of children born to a married woman and the number surviving.
2. Her age at birth of first child.
3. Do you employ a) paid assistance b) member of household, if so how many?
4. Are you in search of employment (for unemployed) and how long have been you in search of it?
5. How far have you read?

Besides, the question on literacy was asked in a different way,' "Can you both read and write? If so, what script do you write?"

Can you read only?” This was the last Census of Pre-Independence period.

II. Censuses of Post-Independence Period

The First Census of Independent India was conducted in year 1951, which is the Eighth Census in its continuous series. The enumeration period of this Census was from 9th to 28th, February 1951. A 3-day revisional round from 1st to 3rd March was undertaken to update the data as on the sunrise of 1st March, the reference date. An Individual Slip was canvassed which contained 13 questions.



Figure 12. Logo of the Census

The particulars like name, relationship, birth place, sex, age, economic status, principal and subsidiary means of livelihood were obtained for each individual. The information on religion, mother tongue, literacy was also obtained. Out of 13 questions, 12 questions with its sub parts were common for all states while remaining 1 question with sub parts relating to fertility, unemployment, infirmity, size of family was optional for certain states. In the Census of 1951, the entire Jammu and Kashmir was excluded and its population was estimated on the basis of past Census figures.

The Census of 1961 was started on 10th February and ended on the sunrise of 1st March. Instead of 3 days as envisaged for Revisional round in the Census of 1951, the Census of 1961 provided 5 days for the Revisional round. However, the reference date remained unchanged. In the place of Individual Slip of 1951 Census, the following two Schedules were canvassed:

- a) Household Schedule - For each Household
- b) Individual Slip - For each Individual

The Household Schedule was divided into A, B & C parts which were further divided into sub parts. Information relating to persons engaged in cultivation and Household industry was collected through this schedule.

The Individual Slip consists of 13 questions. The Individual Slips of 1951 and 1961 Censuses differ in the following ways;

- In 1961, the age at last birth was added
- A question on civil condition asked in 1951 was dropped in 1961.
- In the Census of 1961, the question on birth place was further sub divided into three parts to elicit information on rural /urban status and duration of residence.
- In the 1951 Census, information on economic status with dependency and employment status was obtained, whereas in the Census of 1961, its scope was enlarged and details of employment in four broad categories of workers with nature of industry, class of workers etc. were also obtained.

The Census of 1971 was the 10th Census in its continuous series and 3rd after independence. The census of 1971 was conducted at different times as compared to previous Censuses to avoid clash with mid-term Parliamentary Elections. The Census of 1971 was conducted between 10th March and 31st March and revisional round was taken from 1st to 3rd April. Deviating from past, the reference date was taken as 1st April, 1971. The Census of 1971 was conducted in two phases;

- House Listing Operations
- Actual Enumeration

The first phase i.e., the Housing Listing Operations, was conducted in different parts of country at different times between June to September, 1970 by canvassing two schedules viz, House list and Establishment Schedule. During the second phase, an Individual slip was canvassed which contained 17 questions. The following were the new features of the Individual Slips of the Census of 1971;

- a. A question for getting Information on fertility for currently married women was included.
- b. An additional question “Last Residence” was included to get the information on migration aspect in a better way.
- c. The scope of economic questions was further enlarged and a new question on secondary work was introduced.

The Fourth Census of Independent India, the 11th in the series was conducted from 9th to 28th February, 1981 with a revisional round from 1st to 5th March, 1981. The reference date was again reckoned

as the sunrise of 1st, March which could not be adhered to in the Census of 1971. On the pattern of 1971 Census, this Census also was conducted in two phases with slight modifications. In the first phase, a House List Schedule was canvassed but the Establishment Schedule used in the Census of 1971 was dropped in 1981. Deviating from the past Census, the Census of 1981 added the following Two Schedules in the 2nd phase;

i. Household Schedule

ii. Individual Slip

The Household Schedule consists of two parts. In the first part, along with the particulars of household like religion, SC/ST status and language spoken, this Schedule collected information on predominant construction materials of wall, roof and floor. The information on amenities like drinking water, electricity, toilet facility available to the Household was also collected in the first part of Household schedule. In the second part characteristics of each individual which were identical in the Individual slips were collected. Information on first few columns in part II of Household & Individual Slip were recorded in the field simultaneously while in the remaining columns of Household schedule, the information from Individual slip was transcribed later on. Following changes were incorporated in the Individual Slip of 1981 Census;

- i. The Slip was divided in two parts I and II. In first part 16 questions were included which were canvassed on Universal basis. The second part contained 6 questions, relating to migration and fertility, which were canvassed on Sample basis.
- ii. In part I, two new questions –a) Attending school/college and b) If non worker seeking /available for work were included.

- iii. In part II, a question on reasons for Migration was included.
- iv. In part II, the age at the time of marriage was asked from 'ever married women 'whereas in the 1971 Census this question was asked from 'currently women 'only.

The Census of 1991 was the fifth Census of independent India and conducted as usual from 9th to 28th February, 1991 to present census data as on the sunrise of 1st March, 1991, the reference date. The two phases were continued in the same way as in the previous two Censuses.

In the first phase, a House list was canvassed to collect the information on housing data and also amenities available to the households. The scope of House list was enlarged and for the first time, a question regarding type of fuel used for cooking was added. In the Census of 1981, the question on the availability of toilet facility was canvassed only for urban areas, however, in the Census of 1991, it was extended to rural areas also.

In the Second phase, the following two Schedules were canvassed;

- i. Household Schedule
- ii. Individual Slip

The special features of the 1991 Census schedule as compared to that of 1981 Census are as follows;

- i. The Household Schedule was so designed that the PCA (Primary Census Abstract) with nine-fold industrial category up to village level in rural areas and at charge level in urban areas and also data relating to religion and

mother tongue can be prepared by manual tabulation expeditiously.

- ii. A new question on Ex-service man was included.
- iii. The concept of literacy was changed and children of 7+ age group were considered as literate as compared to 1981 Census, when children up to age group of 4+ were treated as literate.
- iv. In the 1981 Census, the question on seeking/available for work was asked from marginal workers and non-workers whereas in the Census of 1991, this question was limited to Non workers.
- v. In the 1991 Census, a question – “Have you ever worked before” was included for those persons who have reported that they are seeking/available for work.

The Census of India 2001 was the first Census of the 21st Century. As in the past, the Census of 2001 was also conducted in two phases. During the first phase, the House Listing Operations were conducted between April and September 2000, in which a house list was canvassed. During House listing, information on a large number of new items such as condition of the building, number of independent sleeping rooms for married couples, type of toilets, availability of drainage with further bifurcation of open or close drainage, bathing and cooking facility within the house was collected. Some of the questions like number of living rooms and number of married couples, which were canvassed in the Second phase of the Census of 1991 through Household schedule, were canvassed during the first phase through House list in the 2011 Census. Besides, information relating to possession of certain assets like cycle, scooter/motor cycle/moped, radio,

television, telephone, availing of banking facility etc. were also collected.

The second phase, namely 'Population Enumeration' was undertaken between 9th and 28th February 2001 with revisional round from 1st March to 5th March, 2001. Deviating from past censuses, the census movement was 00.00 hours of 1st March, which was otherwise mostly sun rise of 1st March of relevant Census years(except 1971).In certain snow bound areas of Himachal Pradesh, Uttaranchal (Now Uttarakhand) and also J&K, the enumeration was taken between 11th and 30th September 2000 but in certain districts of J&K it was extended from 1st October to 15th November 2000. In Kinnaur district of Himachal Pradesh due to flood the enumeration was conducted from 12th to 31st May, 2001. Due to earth quake in the Kachchh district in Gujarat, the population enumeration was undertaken during 9th February to 28th February, 2002.

In the second phase, the Household Schedule and Individual Slip were blended into one, namely, Household Schedule, where the questions which were canvassed in Household Schedule and Individual Slips in the previous two Censuses were put together. The Household Schedule of the 2001 Census is designed to contain 23 questions which run into 39 columns printed on both sides of the Schedule. Following were the new features of the Household Schedule of 2001;

- i. Information regarding age at the time of marriage was collected for males also.
- ii. The type of educational institutions being attended by a person - vocational, other institutes and, literacy center were added.

- iii. A new question to collect information on total or partial disability was canvassed. It is to be noted that the question on disability was added in the first phase of the Census of 1981 was subsequently dropped in the Census of 1991.
- iv. Question on seeking and available for work was also canvassed for marginal workers and question on secondary work of the main workers was dropped.
- v. A new question on distance travelled by a person to his/her work place and also mode of travel was added for persons engaged in non-agricultural activities.
- vi. Sex wise information was collected for children born alive during last one year.
- vii. Net area of land under cultivation/plantation and net area of irrigated land were also collected for those households who were engaged in cultivation/plantation in Part III of Household Schedule.
- viii. For the first time, provision was made in the Household Schedule for taking signature or thumb impression of the respondent.

It is noteworthy that the Census of 2001 made a quantum leap in the use of technology for survey and census' purposes. The schedules for different phases were scanned through high speed scanners and hand written data from the schedules were converted into digitized form through Intelligent Character Reading (ICR).

The 2011 Census of India began its activities in two different phases. The first phase – House listing and Housing Census were conducted between April and June, 2010 in different States and Union Territories. A Schedule was canvassed during this phase to

collect information on Housing and amenities available to the households. For the first time, each schedule was assigned a serial number to maintain a proper account of each and every form.

The major departure from the earlier Censuses was that a National Population Register (NPR) at the time of House listing and Housing Census was incorporated. The NPR is a register of usual residents of the country. It will be a comprehensive identity data base that would help in providing the beneficial schemes and services under the Government programmes to improve planning and help to strengthen security of the country. The information collected through NPR was used for providing a Unique Identity Number after a detailed procedure. The House listing and Housing Census of 2011 contain 34 questions with following modifications / additions compared to the Census.

- i. The question on the number of separate bed rooms for married couple was dropped.
- ii. A new question on the availability of Computer/ Laptop, with or without internet facility was included.
- iii. A question on Mobile phone with telephone facility was added.
- iv. The question on the availability of latrine was further divided into two parts- i) Latrine within the premises ii) Type of Latrine.
- v. The question regarding the source of drinking water was attached, and the nature of tap water was divided into tap water from Treated source and tap water from Untreated source. Besides separate codes were given for Covered and Uncovered Well.

- vi. For the type of latrines using, separate code for public latrine was included.
- vii. NPG was included under fuel used for cooking.

The Second phase of the Census of 2011 was conducted from 9th to 28th February 2011 with 5 days revisional round from 1st to 5th March, 2011 so that the population figures with reference to Reference date, i.e., 00.00 hours of 1st March, 2011 can be obtained. During the second phase, Household Schedule was to be canvassed. Following are the main changes of Household Schedule of the 2011 Census as compared to the 2001 Census;

- i. Separate code for 'Others' was introduced under column Sex.
- ii. Instead of one code, two separate codes were given for Divorced and Separated.
- iii. Date of Birth was to be recorded in addition to Age.
- iv. In the Census of 2001, under SC/ST, only name of Caste/Tribe was collected in case of those persons who declared themselves as SC/ST. But in the Census of 2011, a filter question was separately introduced enquiring 'If the person is SC/ST'. If so, then the name and details of the SC/ST were asked.
- v. The question on disability was further divided in three sub parts. In the type of disability, separate codes for Mental Retardation, Mental Illness and Multiple Disabilities were given. In case of Multiple Disabilities, provision was made for recording maximum 3 types of disability.

- vi. Under question 'Status of attendance in educational institutions' separate codes were given for special school for disabled. For those who are not attending any educational institutions, provisions were made for collecting information on those who have either attended any institution before and also for those who have never attended any educational institution.
- vii. For "Rentier" separate code was given under non workers category.
- viii. Under the question 'Travel to Place of work', one-way distance from residence to place of work was collected.
- ix. Under the questions of migration in the 2001 Census, only names of district, state and country were collected, but apart from these, the name of village/ town was added.

The Indian Censuses have not been a mere statistical operation and exercise, but the data collected and information culled out are not only scrutinized properly at different levels but presented with cross classification of various parameters for interpretation and analysis in an interesting and productive manner, so as to make use of these details for sustainable social development and welfare. It may be seen from the history of Indian Censuses that how the changes have taken place from one census to another depending upon the needs of the time, region and also for the demand of data users and with the development of technology are so significant and noteworthy.

The Indian Census is well recognized and acclaimed for the data it reveals. The Census makes it challenging to get the problems and solutions relating to political, social and cultural aspects. Despite all these, the Census in India is a continuous process incorporating almost all the details and challenges and making

use of the outcome for decision making and for the development, well-being and safety of the people being.

INDIA - REGIONAL GEOGRAPHIES AND SOCIETIES

India is a vast country with a complex society, topography and with varied land forms. It is very difficult to understand India in its entirety in a comprehensive and meaningful manner. India displays great physical and geographical variation and these characteristics make it challenging and impossible to have clear cut regional divisions and dominions. Geology, structure, relief and physiographic factors together with the positional factor provide a fairly clear-cut division of India into four units, viz. the Northern mountains including the Himalayas and the northeast mountain ranges; the Indo-Gangetic plains, including the Thar Desert; the Central Highlands and Deccan Plateau; and the Coastal Plains including the East Coast, West Coast, the Bordering seas and Islands.

(A) MOUNTAINS

A great arc of mountains, composed of the Himalaya, the Hindu Kush and the Patkai ranges, define the Indian subcontinent. These mountains were formed by the ongoing tectonic collision of the Indian Plate with the Eurasian Plate which started some 50 million years ago. These mountain ranges are the home to some of the tallest mountains in the world and provide a natural barrier against the cold polar winds. They also facilitate the coming of monsoons that drive the climate of India. The protection and climatic control these mountain ranges provided has been a geographical quality that has assisted India's position as a Great power. The numerous rivers that originate in these mountains provide water to the fertile Indo-Gangetic plains. These mountains are recognised by Bio-geographers as the boundary

between two of the earth's great eco-zones; the Temperate Palearctic that covers most of Eurasia, and the Tropical and Subtropical Indomalaya eco-zone that includes the Indian subcontinent and extended up to Southeast Asia and Indonesia. Historically, these ranges have served as barriers to invaders.

India has seven major Mountain Ranges having peaks of over 1,000 m (3,300 feet). The Himalayas are the only mountain ranges to have snow-capped peaks. These ranges are:

1. Himalayan Ranges
2. Karakoram and Pir Panjal
3. Patkai Ranges
4. The Satpura and the Vindhyas
5. Aravalli Ranges
6. The Sahyadri or Western Ghats
- 7, Eastern Ghats

1. The Himalayan Mountain Ranges

The Himalaya mountain ranges are the world's highest mountain ranges. They form India's north-eastern border, separating it from the rest of Asia. The Himalayas are one of the world's youngest mountain ranges, and extend almost uninterrupted for a distance of 2,500 km (1,550 miles), covering an area of 500,000 km² (193,000 square miles).

The Himalayas extend from the state of Jammu and Kashmir in the west to the state of Arunachal Pradesh in the east. These states along with Himachal Pradesh, Uttaranchal, and Sikkim lie mostly

in the Himalayan region. Some of the Himalayan peaks range over 7,000 m (23,000 feet) and the snow line ranges between 6,000 m (19,600 feet) in Sikkim to around 3,000 m (9,850 feet) in Kashmir. Kangchenjunga, which lies in Sikkim, is the highest point in the country's territory (undisputed). Most peaks in the Himalayas remain snowbound throughout the year.

The Shiwalik, or lower Himalaya, consists of smaller hills towards the Indian side. Most of the rock formations are young and highly unstable, with landslides being a regular phenomenon during the rainy season. Many of India's hill stations are located on this range. The climate varies from sub-tropical in the foothills to tundra at the higher elevations of these mountain ranges.

2. The Karakoram and Pir Panjal Ranges

It lies to the Northwest and South of the Himalayan Mountain Ranges. It has a length of 500 kilometres and holds many largest peaks of Earth. K2, the second highest peak of the World at 8611 m lie in this range.

The Pir Panjal Range is located in the southern direction of the Himalayas starting from Himachal Pradesh in India and running northwest towards Jammu and Kashmir

3. The Patkai Ranges

The mountains on India's eastern border with Myanmar are called as the Patkai or the Purvanchal. They were created by the same tectonic processes that resulted in the formation of the Himalaya. The features of the Patkai ranges are conical peaks, steep slopes and deep valleys. The Patkai ranges are not as rugged or tall as the Himalayas. There are three hill ranges that come under the Patkai: The Patkai-Bum, the Garo- Khasi- Jaintia, and the Lushai hills. The Garo-Khasi range is in the Indian state of Meghalaya.

The climate ranges from temperate to alpine due to altitude. Cherrapunji, which lies on the windward side of these hills, has the distinction of being the wettest place in the world, receiving almost the highest annual rainfall.

4. The Satpura and the Vindhya in central India.

The Satpura Range is a range of hills in central India. It begins in eastern Gujarat near the Arabian Sea coast, then runs east through Maharashtra, Madhya Pradesh and ends in the state of Chhattisgarh. It extends for a distance of 900 km with many of its peaks rising above 1000 m (3,300 feet). It is angular in shape, with its vertex at Ratnapuri and the two sides being parallel to the Tapti and the Narmada rivers. It runs parallel to the Vindhya Range, which lies to the north, and these two east-west ranges divide the Indo-Gangetic plain of northern India from the Deccan Plateau lying in the south. The Narmada runs in the depression between the Satpura and Vindhya ranges, and drains the northern slope of the Satpura range, running west towards the Arabian Sea.

The Vindhya Range runs across most of central India, covering a distance of 1,050 km (652 miles). The average elevation of these hills is 300 m (1,000 feet). They are believed to have been formed by the wastes created due to the weathering of the ancient Aravalli mountains. It geographically separates northern India from southern India. The western end of the range lies in eastern Gujarat, near its border with the state of Madhya Pradesh, and the range runs east and north nearly to the Ganges River at Mirzapur.

5. The Aravalli range in Rajasthan.

The Aravalli Range is the oldest mountain range in India, running from northeast to southwest across Rajasthan in western India, extending approximately 500 km (310 miles). The northern end of the range continues as isolated hills and rocky ridges into

Haryana, ending near Delhi. The highest peak is Mount Abu, rising to 1,722 m (5,653 feet), lying near the southwestern extremity of the range, close to the border with Gujarat. The city of Ajmer with its lake lies on the southern slope of the range in Rajasthan. The Aravalli Range is the eroded stub of an ancient folded mountain system that was once snow-capped. The range rose in a Precambrian event called the Aravalli-Delhi orogen. The range joins two of the ancient segments that make up the Indian Craton, the Marwar segment to the northwest of the range, and the Bundelkhand segment to the southeast. The present Aravalli range is only a remnant of the gigantic system that existed in prehistoric times with several of its summits rising above the snow line and nourishing glaciers of stupendous magnitude which in turn fed many great rivers.

6. The Western Ghats or the Sahyadri

The Western Ghats or Sahyadri mountains run along the western edge of India's Deccan Plateau, and separate the Deccan plateau from a narrow coastal plain along the Arabian Sea. The range starts south of the Tapti River near the border of Gujarat and Maharashtra, and runs approximately 1,600 km (1,000 miles) through the states of Maharashtra, Goa, Karnataka, Kerala, and Tamil Nadu, almost to the southern tip of the Indian peninsula. The average elevation is around 1,000 m with the higher peaks occurring in the southern section in Nilgiris and in Kerala. The Anamudi in the Cardamom Hills at 2,695 m (8,841 feet) in Kerala is the highest peak in the Western Ghats.

7. The Eastern Ghats

The Eastern Ghats are a discontinuous range of mountains, which have been eroded and cut through by the four major rivers of southern India, the Godavari, the Mahanadi, the Krishna, and the

Kaveri. These mountain ranges extend from West Bengal in the north, through Orissa and Andhra Pradesh to Tamil Nadu in the south. They run parallel to the Bay of Bengal and are not as tall as the Western Ghats, though some of its peaks are over 1000 m in height.

The Eastern and Western Ghats meet at the Nilgiris or Malay knot in Tamil Nadu. The Anamudi in the Cardamom Hills at 2,695 m (8,841 feet) in Kerala is the highest peak in the Western Ghats. The Nilgiris are considered to be a part of the Western Ghats

(B) INDO-GANGETIC PLAINS

The Indo-Gangetic plains are large floodplains of the Indus and the Ganga- Brahmaputra river systems. They run parallel to the Himalaya mountains, from Jammu and Kashmir in the west to Assam in the east, draining the states of Punjab, Haryana, eastern Rajasthan, Uttar Pradesh, Bihar, Jharkhand and West Bengal. The plains encompass an area of 700,000 km² (270,000-mile²) and vary in width through their length by several hundred kilometres. Major rivers that form a part of this system are the Ganga (Ganges), the Indus River along with their tributaries; Beas, Ravi, Sutlej and Chenab, the Yamuna, the Gomti and the Chambal

The Indo-Gangetic belt is the world's most extensive expanse of uninterrupted alluvium formed by the deposition of silt by the numerous rivers. The plains are flat and mostly treeless, making it conducive for irrigation through canals. The area is also rich in ground water sources.

The plains are one of the world's most intensely farmed areas. Crops grown on the Indo-Gangetic Plain are primarily rice and wheat, grown in rotation basis. Other crops include maize, sugarcane and cotton. Also known as the Great Plains, the Indo-Gangetic plains rank among the world's most densely populated

areas. Water bodies of India are Indian ocean, Arabian sea, Bay of Bengal.

(C) THAR DESERT

The Thar Desert (also known as the Great Indian Desert) is a hot desert that forms a significant portion of western India. Spread over four states in India – Punjab, Haryana, Rajasthan, and Gujarat it covers an area of 208,110 km² (80,350-mile²). The desert continues into Pakistan as the Cholistan Desert. Most of the Thar Desert is situated in Rajasthan, covering 61% of its geographic area. Most of the desert is rocky, with a small part of the extreme west of the desert being sandy.

The origin of the Thar Desert is uncertain. Some geologists consider it to be 4,000 to 10,000 years old, whereas others state that aridity began in this region much earlier. The area is characterised by extreme temperatures of above 45 ° C (113 ° F) in summer to below freezing in winters. Rainfall is precarious and erratic, ranging from below 120 mm (4.72 in) in the extreme west to 375 mm (14.75 in) eastward. The lack of rainfall is mainly due to the unique position of the desert with respect to the Aravalli range. The desert lies in the rain shadow area of the Bay of Bengal arm of the southwest monsoon. The parallel nature of the range to the Arabian Sea arm also means that the desert does not receive much rainfall.

The desert can be divided into two regions, the Great Desert and the Little Desert. The Great Desert extends northwards from the edge of the Rann of Kutch region of Gujarat. The Little Desert extends from the River Luni between the towns of Jodhpur and Jaisalmer, up to the northern areas. The soils of the arid region are generally sandy to sandy-loam in texture. The consistency and depth vary according to the topographical features. The low-lying

loams are heavier and may have a hard pan of clay, calcium carbonate or gypsum. Due to the low population density, the effect of the population on the environment is relatively less compared to the rest of India.

(D) THE CENTRAL HIGHLANDS

The Central Highlands are composed of three main plateaus – the Malwa Plateau in the west, the Deccan Plateau in the south, (covering most of the Indian peninsula); and the Chota Nagpur Plateau in Jharkhand towards the east.

Plateaus

- i. **The Malwa Plateau** is a sub physical division of Central Highlands situated mostly in Madhya Pradesh and Rajasthan. It is a region in west-central northern India occupying a plateau of volcanic origin in the western part of Madhya Pradesh and eastern parts of Rajasthan. It made up of rocks of Deccan trap. It starts from the mouth of the Narmada River. The average elevation is about 350-450 metres. It comprises of black soil which is suitable for the cultivation of sugar cane, cotton, soya bean and other cash crops.
- ii. **The Deccan plateau** is a large triangular plateau, bounded by the Vindhyas to the north and flanked by the Eastern and Western Ghats. The Deccan covers a total area of 1.9 million km² (735,000-mile²). It is mostly flat, with elevations ranging from 300 to 600 m (1,000 to 2,000 feet). The name Deccan comes from the Sanskrit word Dakshina, which means "the South". The plateau slopes gently from west to east and gives rise to several peninsular rivers such as the Godavari, the Krishna, the Kaveri and the Narmada. This region is mostly semi-arid as it lies on the leeward side of both Ghats. Much of the Deccan is covered by thorn scrub forest scattered with

small regions of deciduous broadleaf forest. The climate of this Plateau ranges from hot summers to mild winters.

- iii. **The Chota Nagpur Plateau** is a plateau in eastern India, which covers much of the state of Jharkhand as well as adjacent parts of Orissa, Bihar, and Chhattisgarh. The total area of Chota Nagpur Plateau is approximately 65,000 km². The Chota Nagpur Plateau is made up of three smaller plateaus, the Ranchi, the Hazaribagh, and the Kodarma plateaus. The Ranchi plateau is the largest of the plateaus, with an average elevation of 700 m (2,300 feet). Much of the plateau is forested, covered by the Chota Nagpur dry deciduous forests. The plateau is famous for its vast reserves of ores and coal.

Besides the Great Indian peninsula, the Kathiawar Peninsula in Gujarat is another large peninsula of India.

(E) THE EAST COAST

The Eastern Coastal Plain is a wide stretch of land lying between the Eastern Ghats and the Bay of Bengal. It stretches from Tamil Nadu in the south to West Bengal in the north. The deltas of many of India's rivers form a major portion of these plains. The Mahanadi, the Godavari, the Kaveri and the Krishna rivers drain these plains. The region receives both the Northeast and Southwest monsoon rains with its annual rainfall averaging between 1,000 mm (40 in) and 3,000 mm (120 in). The width of the plains varies between 100 to 130 km (62 to 80 miles).

The plains are divided into six regions: The Mahanadi Delta; the Southern Andhra Pradesh Plain; the Krishna Godavari Deltas; the Kanyakumari Coast; the Coromandel Coast and the Sandy Littoral.

(F) THE WEST COAST

The Western Coastal Plain is a narrow strip of land sandwiched between the Western Ghats and the Arabian Sea. The strip begins in Gujarat in the north and extends across the states of Maharashtra, Goa, Karnataka and Kerala. The plains are narrow, and range from 50 to 100 km (30 to 60 miles) in width.

Small rivers and numerous backwaters inundate the region. The rivers, which originate in the Western Ghats, are fast flowing and are mostly perennial. The fast-flowing nature of the rivers results in the formation of estuaries rather than deltas. The major rivers flowing into the sea are the Tapti, the Narmada, the Mandovi and the Zuari.

The coast is divided into three regions. The northern region of Maharashtra and Goa is known as the Konkan Coast; the central region of Karnataka is known as the Kanara Coast and the southern coastline of Kerala is known as the Malabar Coast. Vegetation in this region is mostly deciduous. The Malabar Coast has its own unique ecoregion known as the Malabar Coast moist forests.

(G) ISLANDS

India has two major offshore island possessions: the Lakshadweep islands and the Andaman and Nicobar Islands. Both these island groups are administered by the Union Government of India as Union Territories.

The Lakshadweep islands lie 200 to 300 km (124 to 186 miles) off the coast of Kerala in the Arabian Sea. It consists of twelve coral atolls, three coral reefs, and five banks. Ten of these islands are inhabited.

The Andaman and Nicobar island chain lies in the Bay of Bengal near the Myanmar coast. It is located 950 km (590 miles) from Kolkata (Calcutta) and 193 km (120 miles) from Cape Negrais in Myanmar. The territory consists of two island groups, the Andaman Islands and the Nicobar Islands. The Andaman Islands consist of 204 islands having a total length of 352 km (220 miles). The Nicobar Islands, which lie south of the Andamans, consist of twenty-two islands with a total area of 1,841 km² (710-mile²). The highest point is Mount Thuillier at 642 m (2,140 feet). Indira Point, India's southernmost land point is situated in the Nicobar Islands, and lies just 189 km (117 miles) from the Indonesian island of Sumatra to the southeast.

The important islands just off the Indian coast include Diu, a former Portuguese exclave; Majuli, Asia's largest freshwater island; Salsette Island, India's most populous island, on which Mumbai (Bombay) city is located; Elephanta in Bombay Harbour; and Sri Harikota Barrier Island in Andhra Pradesh.

The above analysis demonstrates the significance and the complex nature of the topography, geography, land forms with regional specifications and the ensuing complex nature of society with its people living at different levels.

URBANISATION

Urbanization is the process through which cities grow and develop, and higher and higher percentages of the population comes to live in the city. Urbanization, the spatial facet of the industrial and scientific revolution of the past two hundred years, has attracted the attention of scholars, social reformers, cultural figures and politicians from the middle of the 19th century. Urbanization, on the one hand, deals with the study of cities and city systems, and on the other hand, studies the conceptual

distinction applied in the studies of urbanization. In simple words, urbanization can be described as a process of change as it occurs when there is change in the different conditions and relations within the society. In the field of demography, the level of urbanization is measured by the percentage of population living in urban areas. In order to understand this process, one needs to examine the factors that initiate and sustain this process, as well as of its implications in broad general terms.

India experiences most characteristic features of urbanization among the developing countries. According to the 2011 Census, urbanization in India has increased at a faster rate than expected. This is an over turn of the declining trend of the level of urbanization as observed during the 1980s and 1990s. Another important aspect is that for the first time since independence the absolute increase in the urban population was higher than that of in the rural population. This can be attributed to the manifold increase in the number of towns and also the concentration of population residing in the urban areas. The number of urban agglomeration /towns has grown from 1827 in 1901 to 7935 in 2011; while, the total population in urban areas has increased from 2.58 crores in 1901 to 37.71 crores in 2011. This data clearly show that India has been experiencing a gradual increase in the trend of urbanization.

Year	No. of towns	Total Urban population
1901	1827	2.58 crores
2011	7935	37.71 crores

Urbanization and Urban Areas - Concepts

As already stated, Urbanisation at the first level is the process of the growth and development of cities and at the second level, it is theorising or conceptualising. There are four interpretations of urbanization;

1. Behavioural
2. Structural
3. Demographic
4. Geographical

1. Behavioural: The first one to start the study of urbanization is Louis Wirth, when he published a paper called “Urbanization - a way of life” in 1938. He said (that all the urban studies were denoted to city level studies and it was very quantifiable work where they were measuring certain dimensions of the cities), that “of cities is not enough there should exist a theory of cities which should be based on the behaviour of social groups”. There are three things within the city which affect the social groups-

- a) **Size** (relations between the different members of the city): Although, the city is generally big in size and has a large population, but people are segregated from each other. Due to this, the relationship between two persons becomes impersonal and is characterized by competition rather than complementary or friendly. Because the city life leads to anomie i.e. one is lost in a crowd.
- b) **Density:** Cities have very high density of population and this leads to great contrasts and diversities, where wealth

and property live side by side. And, this ultimately leads to mutual exploitation.

- c) **Diversification:** There are too many different types of people come and live in the cities thus, breaking caste and creed barriers/boundaries because the ability to earn is less rigid. Thus, it leads to a lot of role confusion and conflicts.

2. Structural: Urbanization is the process when agricultural communities are transformed into industrial communities, who live in urban areas, thus leading to a process of urbanization. This is a result of industrialization and economic development. So, occupational structure taking place (agricultural- non-agricultural) in a region generally tends to bring the process of urbanisation.

3. Demographic: Demographic aspects play a vital role in the making of urbanisation. The increase in population effects the transformation of rural settlements into urban settlements. So, the Scholars working on Urbanisation try to understand this from the point of view of migration and thus, deal with population mobility. For them, urbanization as a process takes place primarily because of the following factors.

- Growth of individual towns.
- Multiplications of towns.

4. Geographical: The spatial analysis is to understand all the different phenomena in their own space and their distribution.

Urbanization in India: Pre-Independence Period (A Colonial Legacy) and Post-Independence period

The story of urbanization in India needs to be studied in its historical context; a story of spatial and temporal discontinuities (Ramachandran, 1989). The earliest urban developments were confined to the Indus Valley and its adjoining regions. Other parts of the country were untouched by this process. In the early-historical period it was experienced in the Middle Gangetic plains and in the southern parts of the Indian Peninsula.

Similar picture was seen even in the historical period where large parts of the country were hardly affected by urbanization. In modern times these spatial discontinuities continue to be a dominant characteristic of urbanization in India. The factors responsible for urbanization varied from time to time. Hence, urbanisation and the process of urbanisation can either be Cultural process or Political process or both. It can also be an Economic process. In ancient times, urbanization was synonym to the origin and rise of civilization thus can be termed as a Cultural process. From historical periods to the period of the British in India, urbanization was related to the rise and fall of kingdoms, dynasties and empires; thus, a political process. In modern times, urbanization is perceived as a process which is closely related to economic development and industrialization; thus, an economic process.

Let's now discuss the trends of urbanisation in two specific time periods, the British period or the Colonial period and the Post-Independence period.

The British Period (1800 -1947)

The British administration had a negative impact on the Indian urban morphology as the pre-British cities were on decline as the British were hardly interested in the traditional industries of India. Moreover, introduction of Railways resulted in the diversion of

trade routes into different channels as every Railway station became a point of export of materials for its hinterland, thus depriving earlier trade centers of their monopoly. Whatever the reason may be, in a nutshell, it can be said that India's urban landscape went through a transformation during the 150 years of the British rule. The main features of this period include:

- a) The creation of the three Metropolitan Port Cities – Bombay, Calcutta and Madras - which emerged as the leading colonial cities of the world. All the older cities which were prominent in the Mughal period were reduced to small towns. These three cities became the leading administrative, commercial and industrial centres during the British Period. The entire cultural landscape of these cities was of British taste and interest and were in sharp contrast to the urban designs of the Mughal period.
- b) The creation of hill stations in the Himalayan foothills and in South India along with the introduction of tea and coffee plantations resulted in the emergence of number of smaller settlements with distinct urban characteristics. Between 1815 and 1870 over 80 hill stations were developed in four different regions of the country to serve the four metropolitan cities of Delhi, Calcutta, Bombay and Madras. These were Shimla-Mussoorie-Nainital near Delhi; Darjeeling-Shillong near Calcutta; Mahabaleshwar near Bombay and the Nilgiris-Kodaikanal area near Madras. The plantation settlements were another significant feature of the urbanisation process in India. Although these centres were not as large in size, they had distinct urban features because of processing plants, residences of workers and associated commercial establishments.

- c) The modification of existing urban landscape through the introduction of civil lines and cantonments was another feature in the Colonial period. These modifications were most noticed in the administrative centers of the British like the Provincial Capitals, the District Headquarters and the Tehsil level Urban Administrative Towns. The ‘civil lines’ were a new addition and came up around administrative centres, courts and the residences of the officers. Cantonments were fewer in number; built exclusively for the British officers and the army men. These modifications segregated the city and the gap between rural and urban increased manifold.

- d) The introduction of the Railways and the rise of modern industries led to the development of new industrial townships like Jamshedpur, Asansol and Dhanbad. The introduction of Railways had an indirect influence on urbanization. Though, it led to the emergence of the Metropolitan cities as the primary foci, it even brought unplanned urbanization as the city started growing in an unplanned manner around the Railway station. Industrial development as such during this period was very modest. Most of the industries were concentrated near the Metropolitan cities with exceptions like Jamshedpur which emerged as towns after the establishment of Iron and steel plants.

- e) The improvements in urban amenities and administration during the British rule were one of the major benefits that cities experienced during this time. The facilities like piped water supply, streetlighting domestic electrification, sewerage system, shopping areas, Green spaces in the form of parks and playing grounds were roped in; though these were restricted to the civil lines and the cantonment areas. Most of the cities were deprived of

these facilities. Municipal bodies were set up in a number of cities in 1881 but again these were found only in areas where British population was residing. This again brought segregation within the cities.

The above account clearly depicts that cities became the primary foci during the British period. Even the centers of education were established in the form of Schools, Colleges and Universities to suit the interests and needs of the Colonial administration. As a result, an urban elite emerged which was soaked in westernization. This led to the widening of gap between the rural and the urban which continues to plague the social, economic and political system of India even today.

The Post – Independence Period (after 1947)

The process of urbanization in the Post-Independence Period witnessed a new phase. During this period this process has been characterized by rapid urbanization and dominated by the mushrooming of one lakh and million plus cities. The major changes that India have witnessed during this period can be summarized as follows:

- a) The influx of refugees and their settlement in the urban areas of northern part of the country.
- b) The establishment of new planned administrative centers like Chandigarh and Bhubaneshwar.
- c) The construction of new industrial cities and new industrial townships near major cities.
- d) The rapid growth of one-lakh and million cities.
- e) The stagnation and in some cases the decline of small towns.

- f) The proliferation of slums and squatter settlements in the big cities and the emergence of urban-rural fringe.
- g) The introduction of urban planning through Five Year Plans and the improvement in urban governance through the 74th Amendment Act.

The process of urbanization in India is not at all different from that of the other developing countries of the world; it is also characterized with uneven pattern of development of small towns and big cities within the system. According to the 2011 Census, the urban population grew to 377 million showing a growth rate of 2.76% per annum during 2001-2011. The level of urbanization in the country as a whole increased from 27.7% in 2001 to 31.1% in 2011 – an increase of 3.3 percentage points during 2001-2011 compared to an increase of 2.1 percentage points during 1991-2001. It may be noted that the Indian economy has grown from about 6% per annum during the 1990s to about 8% during the first decade of the 2000s (Ahluwalia 2011). This clearly reflects the power of economic growth in bringing about faster urbanization during 2001-2011. Thus, in recent years urbanization in India has acted more as an economic process than a social or political one.

Trends of Urbanization in India (1901 – 2011)

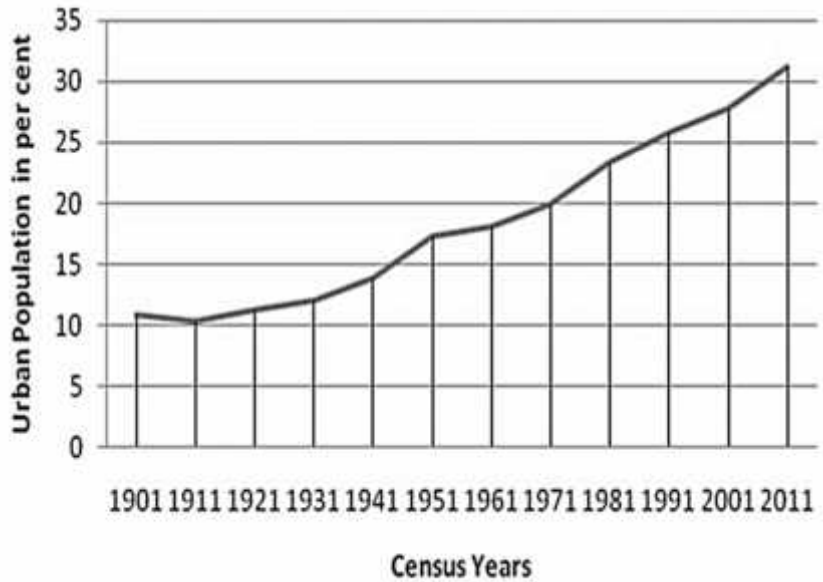
Census Years	No. of Urban Agglomerations / Towns	Urban Population In Per Cent	Annual exponential Growth rate of Urban Population
1901	1827	10.84	

School of Distance Education

1911	1825	10.29	0.03
1921	1949	11.18	0.79
1931	2072	11.99	1.75
1941	2250	13.86	2.77
1951	2843	17.29	3.47
1961	2363	17.97	2.34
1971	2590	19.91	3.21
1981	3378	23.33	3.83
1991	3768	25.72	3.09
2001	5161	27.78	2.74
2011	7935	31.16	2.76

The World Cities Day is observed on 31st October every year to promote the international community's interest in global urbanisation, push forward co-operation among nations in meeting opportunities and addressing challenges of urbanisation and contributing to sustainable urban development around the world.

It was decided on 27th December 2013 by the General



Reference:

A.K. Bagchi, *The Perilous Passage*, OUP, 2005

Achin Vanaik, ed., *Masks of Empire*, Tulika, 2007.

Alice Thorner and Sujata Patel ed., *Bombay: The making of a city*, (2 vols), OUP.

Asha Sarangi, ed., *Language and Politics in India*, Oxford, 2008.

B. Subbarao, *Personality of India*, Bombay, 1954.

Carl O. Sauer, 'The Morphology of Landscape', *Geography* 2, (2), University of California Publications, 1925.

D.D. Kosambi, *An Introduction to the Study of Indian History*, Bombay, 1956.

D. Gregory and J. Urry, eds, *Social relations and Spatial structures*, London, 1985.

D. Massey, *Spatial Division of Labour*, London, 1984.

David Harvey, *Explanation in Geography*, London, 1969.

David Harvey, *Limits to Capital*, London, 1982.

David Harvey, *Spaces of Capital*, Edinburgh University Press, 2001.

Sources:

<http://www.aag.org/cs/encyclopedia>

<https://censusindia.gov.in/>

e-pathshala, “Process of urbanization in India: a colonial legacy and the post-independence characteristics.”

<https://www.nationalgeographic.org/encyclopedia/geography/>

<https://www.khanacademy.org/humanities/big-history-project/expansion-interconnection/exploration-interconnection/a/marco-polo>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7150208/>

<https://hc.arhangel'sk3d.ru/564>

<https://egyankosh.ac.in/bitstream/123456789/57309/3/Unit-1.pdf>

<https://www.nap.edu/read/4913/chapter/5>

<https://egyankosh.ac.in/bitstream/123456789/57314/3/Unit-2.pdf>

https://www.worldhistory.org/Indus_Valley_Civilization/

<https://www.khanacademy.org/humanities/whp-origins/era-3-cities-societies-and-empires-6000-bce-to-700-c-e/36-the-growth-of-empires-beta/a/read-the-mauryan-and-gupta-empires-beta>

<https://www.britannica.com/topic/guild-trade-association>

<https://www.britannica.com/place/Ganges-River>

<https://www.clearias.com/medieval-india-towns-traders-and-craftpersons/>

<https://www.encyclopedia.com/international/encyclopedias-almanacs-transcripts-and-maps/early-maritime-contacts>

https://ibm.gov.in/writereaddata/files/06062017100713Iron%20and%20Steel%202020_2.pdf

<http://www.igntu.ac.in/eContent/IGNTU-eContent-374229503877-BA-AIHC-6-DrJanardhanaB-ScienceandTechnologyinAncientIndia-3.pdf>

<https://www.migrationpolicy.org/article/emigration-immigration-and-diaspora-relations-india>

<https://www.fao.org/3/i5188e/i5188e.pdf>

<https://onlinelibrary.wiley.com/doi/10.1111/imre.12095>

https://insa.nic.in/writereaddata/UpLoadedFiles/IJHS/Vol21_14_RDRoy.pdf

https://censusindia.gov.in/Ad_Campaign/drop_in_articles/05-History_of_Census_in_India.pdf