

POPULATION AND SETTLEMENT GEOGRAPHY

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MGG-004 POPULATION AND SETTLEMENT GEOGRAPHY

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BLOCK 1: DEVELOPMENT OF POPULATION GEOGRAPHY

Population Geography is one of the major branches of Human Geography. This branch deals with various attributes of population and their manifestation over time and space. The study of population is a very dynamic subject. Population has two aspects namely quantitative and qualitative. Quantitative aspect deals with the changes in population attributes expressed in terms of number whereas qualitative aspect reflects characteristics in a particular population namely literacy, health condition, skills etc. This Block is divided into four Units that deal with the diverse aspects of Population Geography.

Let us discuss about the content of each unit briefly.

Unit 1: Nature and Scope of Population Geography

As per the theme of this block, this unit being the first unit is devoted to define the population geography and describe the scope and relevance of population geography. This unit also highlights development of population geography as a major branches of the discipline of geography in the world and India. The concluding section of the unit discusses about the sources of data with special reference to India.

Unit 2: Population Distribution

This Unit is devoted to the study of patterns of population distribution across the world and India along with the discussion on measures of population distribution, density and factors influencing distribution. Besides, this unit also discusses rural-urban distribution of Population both at global and India level. A detailed discussion is also presented on the meaning, processes, trends and patterns of urbanization both at global and Indian contexts.

Unit 3: Demographic and Economic Composition

This unit is devoted to the study of the demographic attributes namely age and sex composition and economic attributes like work participation and occupational composition. A detailed discussion is presented on demographic characteristics in terms of age structure and sex ratio, and economic characteristics in terms of work participation rate and occupation structure of the workers in the world and its different parts including India.

Unit 4: Socio-Cultural Composition

This unit is devoted to the study of socio-cultural composition of the population such as ethnicity, culture, religion, caste and literacy. Like other themes discussed in the previous two units, a detailed discussion is presented on unevenly distribution of these attributes over space and time and with a focus on their unique regional patterns at different spatial scales- international, national, rural, urban etc.

Our best wishes are always with you to complete this course successfully.

NATURE AND SCOPE OF POPULATION GEOGRAPHY

Structure

1.1	Introduction	1.5	Sources of data with special reference to India
	Expected Learning Outcomes		
1.2	Definition of Population Geography	1.6	Summary
1.3	Scope and Relevance	1.7	Terminal Questions
1.4	Development of the Discipline	1.8	Answers
		1.9	References and Further Reading

1.1 INTRODUCTION

Geography has traditionally been concerned with the relationship between human and the environment. Thus, humans and their activities on the earth's surface have formed essential components of its subject matter. However, the human element in the discipline remained largely neglected for a long time due to a greater emphasis on the physical aspects. It was only toward the end of the 19th century that the foundation for what later came to be known as 'human geography' was laid. It was Friedrich Ratzel (1844-1904) who founded the new sub-discipline for which he coined the term "anthropogeography" (Kosinski, 1984). Ratzel is, therefore, regarded as the most significant single contributor to the development of human geography. He published the first volume of his book Anthropogeography, in which he traced the effects of various physical features on the course of history (James and Martin, 1981). Ratzel had a great interest in the way of life of different tribes, races and nations. His field visits to different countries led him to formulate general concepts about geographic patterns resulting from contact between the aggressively expanding communities and the retreating groups. It was these research experiences that sparked his interest in the study of human geography (Dikshit, 1997).

Though several studies dealing specifically with population did appear in the late 19th and early 20th centuries, on the whole, the population remained a neglected field in the overall scheme of human geography throughout much of

the first half of the last century. Population geography was subsumed mainly within the descriptive Human Geography mainstream (Barcus and Halfacree, 2018:6). In the year 1951, Pierre George, a French geographer, presented a comprehensive treatment for the first time of the facts of the population in geography. However, the emergence and recognition of population geography as a new sub-branch of human geography is largely attributed to the influential statement of Trewartha in the annual meeting of the Association of American Geographers in 1953.

Trewartha held that since geography is fundamentally anthropocentric, the number, densities and qualities of human population provide the essential background to all geography. Thus, population is the pivotal element in geography, and around population all other elements are oriented. According to him, 'population is the point of reference from which all other elements are observed and from which they all, individually and collectively, derive meaning and significance. It is population which provides focus' (Trewartha, 1953:83). Trewartha presented a comprehensive framework for geographical studies on population. The acceptance of the sub-field in human geography owes much to his influential appeal to his fellow geographers.

Trewartha's efforts led to the development and recognition of population geography as a separate sub-discipline within human geography. However, the development was not sudden. Nor was it unexpected. The roots of the sub-field can be located in developments that were taking place both within geography and outside during some earlier periods. While some can be traced, as early as in 19th century, others became potent forces in the first half of the 20th century. In addition to the growing recognition of the significance of human elements in geography, these developments helped a great deal in the emergence, growth and expansion of the sub-field. The growing availability of data on population, increasing use of quantification and access to computers, unprecedented demographic expansion and redistribution of the population along with its socio-economic implications led to increased interest in studies on population. Admittedly, the consequences of these developments were not confined to geography alone. Other branches of study dealing with the human population, viz., demography and population studies, were also undergoing parallel changes. Development in these related disciplines also played a crucial role in the emergence of population geography as a separate and independent sub-field in geography.

Expected Learning Outcomes_____

After studying this unit, you should be able to:

- Define population geography;
- Describe scope and relevance of population geography;
- Discuss development of the discipline, and
- Explain sources of data with special reference to India.

1.2 DEFINITION OF POPULATION GEOGRAPHY

As noted earlier, population geography as an independent sub-field of human geography is a comparatively recent phenomenon. In the expression

population geography', the term population signifies the subject matter and 'geography' refers to the perspective of investigation. Thus, 'population geography' can be interpreted as the study of population in spatial perspective. Etymologically, 'population geography' implies the investigation into human covering of the earth and its various facets with reference to physical and cultural environment. Population geography is concerned with 'the geographic organisation of population and how and why this matters to society. This often involves describing where populations are found, how the size and composition of these population is regulated by the demographic processes of fertility, mortality and migration, and what these patterns of population mean for economic development, ecological change and social issues' (Bailey, 2005).

In the academic world, any discipline is almost invariably defined by its subject matter (Johnston, 1983). The subject matter of population geography has been a matter of debate ever since Trewartha formally raised the issue in 1953. According to *Trewartha*, population geography is concerned with understanding regional differences in the settlement of the earth (Trewartha, 1969). Just as area differentiation is the subject of geography in general, so it is of population geography in particular (Trewartha, 1953). Population geography is the spatial analysis of population that includes 'a wider range of population characteristics than most geographers have normally included in their analysis' (Trewartha, 1953). He proposed a very comprehensive overview of the content of the sub discipline, which many later geographers seem to have followed. Broadly speaking, according to Trewartha, the concern of population geography, can be categorised into three categories:

1. a historical (pre-historic and post-historic) account of population,
2. dynamics of number, size, distribution and growth patterns, and
3. qualities of population and their regional distribution.

According to Trewartha in population geography analysis of world population patterns, population dynamics in terms of fertility, mortality and migration, area aspect of over, optimum and under-population, distribution of population by world regions and settlement types and migration of population (both international and inter-regional) form an integral part. Trewartha in his book entitled *A Geography of Population: World Patterns* devoted first section to describe the geographical account of population in the past while the second incorporated all the characteristics of population including biological, social, cultural and economic characteristics.

John I. Clarke, who is credited with bringing out the first textbook on this sub-discipline in 1965 suggested that population geography is primarily concerned with showing how the spatial variation of population and its various characteristics, such as composition, migration, and growth, are related to the spatial variation of the nature of places (Clarke, 1972). In his view, the main endeavour of population geography is to unravel the complex relationships between population phenomena on the one hand and the cultural environment on the other. The explanation and analysis of these relationships is the very substance of population geography (Clarke, 1972). The second edition of his book on population geography (Clarke, 1972) contains 11

chapters, and his treatment of the subject is in conformity with that of Trewartha, though not as comprehensive as that of the latter.

Zelinsky (1966) defines the sub-discipline as "a science concerned with the ways in which the geographic character of places is shaped by a range of population phenomena and how these, in turn, respond to a range of population phenomena that change both spatially and temporally within the place, following their own laws of behaviour and interacting with each other as well as with numerous non-demographic phenomena" (cited in Hassan, 2005). To delineate the field of population geography, *Zelinsky* suggested that "the list of human characteristics of practical interest to population geography can be equated with those that appear in the census lists and the personal registration systems of the more statistically advanced nations" (Clarke, 1972).

Daniel Noin in 1979, in his book *Geographie de la population* opined that the main concern of population geography is to describe characteristics distribution of population and components of its growth (Woods, 1986b). More recently, while discussing the methodological problems of population geography, *Proyer* suggested that population geography is concerned with analysing and explaining the interrelationship between population phenomena and the geographic character of places, as both vary over space and time (Proyer, 1984). According to him, population phenomena include 'the dynamics of population distribution, rural-urban location, population density and growth (or decline), fertility, mortality, and migration, as well as structural characteristics such as age-sex composition, ethnicity, marital status, economic composition, nationality, and religion'.

Obviously, since its beginning precise delineation the field of the sub-discipline has been a major problem before the scholars. It has been argued that population geographers have spread themselves too thinly over too large a field, so that they have been unable to carve out a niche for themselves in population studies (Woods, 1986). Scholars have therefore suggested that population geography should narrow its focus and concentrate on the components of population change (Woods, 1979, 1982, 1986a; Jones, 1981; Woods and Rees, 1986). Woods (1986a) distinguishes between broad and narrow definitions. The former is described as an elaboration of Trewartha's broad agenda, in which some priority is given to spatial variation in population, while the latter refers to the approach that favours analysis of population dynamics, i.e., fertility, mortality, and migration only. *Noin's* 1984 survey of the content of population geography textbooks published in the last two decades found that the broad definition was the most commonly used (Woods, 1986b). Woods (1979) and Jones (1981), who propose the narrow definition, limit the main concern of population geography to the analysis of fertility, mortality, and migration at various levels. They contend that the narrow definitions reflect a new process orientation that contrasts with the traditional pattern orientation of the broad definitions and is more consistent with current trends in geography as a whole (Clarke, 1984). Woods and Rees (1986) propose the term spatial demography in place of population geography, which differs from the latter 'primarily in its equal emphasis on mortality, fertility, and migration as components of population change and distribution its use of statistical demographic methods, and its

multidisciplinary approach (cited in Heenan, 1988). In the words of Barcus and Halfacree (2018), 'population geography requires the core demographic indicators such as births, deaths, and migration not be considered in isolation, but in their interconnections with the diverse processes that construct everyday life'.

From the foregoing, however, it is clear that the disagreement is primarily over the main thrust of the sub-discipline, rather than the approach and methodology *per se*. Woods himself states that 'the role of population geography is to provide the spatial perspective in population studies' (Woods, 1982), and that 'population geography' should be what geographers do in teaching and research (cited in Heenan, 1988). To quote Heenan, "If this is so, then, given the seemingly increasing erosion of disciplinary boundaries between subjects of common interest in population science, one might argue for a definition that encompasses any work in which the perspective is primarily and explicitly a spatial one - in other words, such a definition would refer to a type of approach and supporting methodology rather than to a more or less exclusive disciplinary orientation" (Heenan, 1988). As Woods himself acknowledged, the two definitions – broad and narrow – are not mutually exclusive, but rather represent differences in emphasis (Woods, 1986b:17). They complement each other and together represent the full diversity of work being done by researchers in the field of population geography.

Clarke has rightly noted that it is impossible to do justice to all aspects of population that appear in census schedules or in the civil registration system (as suggested by Zelinsky), and that some are treated more than others, partly because they are more central to the subject of population geography and partly because they have received more attention from geographers (Clarke, 1972). Newman and Matzke (1984) point out that population geography is a relatively open field of inquiry with an identifiable core beyond which there may be many topics related to people and their well-being (cited in Woods, 1986b:16). The core includes 'demographic variables, population trends and distribution, while beyond that may lie 'social and economic indicators' (e.g., language, ethnicity, religion, occupation); residential characteristics (rural and urban); and 'population in its broader human context' (e.g., resources, politics, policy)' (Woods, 1986b).

To conclude, the main concern of population geography revolves around the following three aspects of human population:

- a) Size and distribution including the rural-urban distribution of population.
- b) Population dynamics - past and present trends in growth and its spatial manifestation; components of population change viz. fertility, mortality and migration.
- c) Population composition and structure: they include a set of demographic characteristics (such as age-sex structure, marital status and average age at marriage etc.); social characteristics (such as caste, racial/ethnic, religious and linguistic composition of population; literacy and levels of educational attainment etc.); and economic characteristics (such as workforce participation rate and workforce structure etc.).

SAQ I

- a. Describe in brief population Geography etymologically.
 - b. State the main concerns of population geography
-

1.3 SCOPE AND RELEVANCE

Population geography covers a wide area. It provides an understanding of the spatial variation in the distribution, growth and composition/ characteristics of population in relation to the nature of places over the earth surface. It is thus concerned with the pattern of distribution of population and its attributes in a region, the processes that have led to a given pattern and its linkages with economic and environmental conditions in the region. In short, population geography revolves around topics such as size, density, distribution (including its rural urban distribution), and growth of population (including components of growth viz. fertility, mortality and migration) along with its salient characteristics and composition of human population in a territorial unit.

According to Edward Ackerman, the identification of generic relations, which encompasses categorization, classification, and differentiation methods, is the initial set of issues in population geography. This is followed by establishment of genetic linkages or dynamic characteristics (processes) of geographical distributions wherein the temporal variable is extremely relevant. Finally, comes the search for aerial association between and among phenomena in the last phase.

Areal differentiation, the primary focus of population geography, is very helpful in addressing the issue of static correlations between variables. A greater understanding of the processes causing areal distribution should result from population analysis by geographers, as articulated in the ideas underlying and by the study of spatial interaction across time.

As already noted above, the credit for population geography as an independent subfield in human geography goes to G. T. Trewartha in 1953. According to him, the scope of population geography can be delineated as follows,

1. Distribution and density of population
2. Growth of population
3. Composition of population
4. Rural and Urban populations
5. Literacy and quality of the population
6. Migration (Movement of people across space)
7. Technological Development and population resources ratio.

John. I. Clarke who is credited with bringing out the first textbook on population geography in 1965 after Trewartha had made a case for population geography. Clarke emphasised on three main aspects of population.

1. *Size and Distribution*: This includes the spatial distribution of population (including distribution between rural and urban areas) and density of population which indicates ratio of people to physical space.
2. *Population composition and structure*: This includes the salient demographic, social and economic characteristics of population. While demographic characteristics included age-sex composition, socio-economic characteristics refer to education, marital status, languages spoken, race/ ethnicity, religions, and employment and occupation.
3. *Population Dynamics*: The analysis of the population dynamics that includes trends in population growth, both past and present, with its spatial manifestation in relation to the components of population change i.e. fertility, mortality and migration.

According to, Wilber Zelinsky a contemporary of Clarke, 'the list of human characteristics of practical interest in the population geography may be equated with 'those appearing in the census schedules and vital registration system of the more statistically advanced nations' (Clarke, 1972:3).

Obviously, if delineated so, the scope of population geography becomes almost identical with that of human geography. Clarke, therefore, rightly remarked that one cannot possibly do justice to all the aspects of population that appear in the census schedules or vital registration system (as suggested by Zelinsky), and that some will receive more treatment than others, partly because they are more central to the theme of population geography, and partly because they have attracted closer attention from geographers (Clarke, 1972:3). Newman and Matzke (1984) suggest that population geography is a relatively open field of inquiry with a recognisable core beyond which there may be many issues that relate to people and their well-being (quoted in Woods, 1986b:16). The core includes 'demographic variables, population change and distribution; while beyond may 'social and economic indicators (e.g. language, ethnicity, religion, occupation); residential characteristics (rural and urban); and 'population in its broader human context' (e.g. resources, politics, policy)' Woods, 1986b:16-17).

To conclude, the main concern of population geography revolves round the following three aspects of human population:

- Size and distribution including the rural-urban distribution of population.
- Population dynamics – past and present trends in growth and its spatial manifestation; components of population change viz. fertility, mortality and migration.
- Population composition and structure. They include a set of demographic characteristics (such as age-sex structure, marital status and average age at marriage etc.); social characteristics (such as caste, racial/ethnic, religious and linguistic composition of population; literacy and levels of educational attainment etc.); and economic characteristics (such as workforce participation rate and workforce structure etc.).

In addition to the above, as government policies and measures in a country have significant bearings on population and its various attributes, a population geographer is also concerned with policies and programmes designed to

regulate population size and its attributes. There exists a very intimate association between population size and economic development. Expanding population is generally viewed as a deterrent to economic progress in a country. Of late, deteriorating environmental quality the world over is also being attributed to rapid growth in population. However, the nature of the precise link between population growth, on the one hand, and economic development and environmental degradation, on the other, varies a great deal from one part of the earth to another depending upon various social and economic parameters. These and similar other issues, therefore, also form part of the overall concern of a population geographer.

SAQ 2

State the scope of Population Geography delineated by Trewartha

1.4 DEVELOPMENT OF THE DISCIPLINE

G. T. Trewartha is credited for the emergence and recognition of population geography as a separate sub-field within the broad framework of human geography. However, before him, Pierre George (1951), a French geographer, had already presented a very comprehensive treatment of the facts of population in geography. If these early works are considered the beginning of population geography, the sub-discipline appears to have witnessed enormous growth and diversification during the last seven decades. It has now become a multifaceted field of study.

The 1960s witnessed the emergence of a large number of textbooks on the theme (for instance by Clarke in 1965; Zelinsky in 1966; Beaujeu-Garnier in 1966; and Trewartha in 1969). Population geography as an independent sub-discipline was introduced at graduate and postgraduate levels in various universities of the world. This was the time when Human Geography was witnessing significant reorientation in the wake of *quantitative revolution*. Population geography could not remain aloof from this development. Under the influence of *positivist* philosophy, scientific methods of analysis were increasingly replacing the 'empiricist-descriptive' approach in regional mode that had dominated the academic discourse for a long time. Population geography, thus, gradually moved away from the traditional focus on 'intrinsic nature and universal attributes of population' to a scientific analysis of demographic facts in spatial perspective (Barcus and Halfacree, 2018:7).

The development of population geography was, however, not as rapid as one might have expected in the 1970s, particularly in the light of further addition to the existing textbooks on the sub discipline. The research output was also not as focused or as innovative as in some other aspects of geography partly because the thrust was in areas somewhat peripheral to population geography (Clarke, 1977:137). Although, there were studies on the relationship of population phenomena with social or economic development, much of the works continued to be descriptive in nature. Likewise, though fertility and mortality did attract the attention, migration analysis engaged population geographers throughout much of the 1960s and the 1970s. Of

many works on migration that appeared during the period, mention may be made of *People on the Move*, a collection of 23 papers by Kosinski and Prothero in 1975. A classic work on migration, it covered such wide-ranging topics as theoretical framework and typology of migration, problems of migration data, empirical and comparative studies of internal migration, issues related with different groups of migration etc. Undoubtedly, the aspect of population geography which developed the most in the early decades was migration analysis, an issue that never appealed to the demographers in the same way as did fertility, nuptiality and mortality.

The major thrust on migration analysis by geographers got further impetus in the wake of rapid world urbanization during 1960s and 1970s particularly in the less developed parts of the world. Population re-distribution and related government policies received increased attention of geographers. One remarkable development in the sub discipline was a move away from mere population patterns to the study of processes especially migration. No sooner had quantitative revolution engulfed the academia in the late 1950s and early 1960s, strong criticism began to pour in. Thus, there was a switch over from the macro analytic explanation of social physics towards micro analytic explanation of *behaviouralism*, though the former was not completely given up (Clarke, 1979:263). Behaviouralism, too, began to be criticised for not completely breaking away from positivism. There was a growing discontent among academia with the process as well the contents or topics of research. By the close of 1970s, thus, Human Geography scholarship started moving away from 'abstracted and objectified value free conception' of positivism towards great diversity of *post-positivist* ways of thinking under the influence of *structuralism* and *humanism* (Barcus and Halfacree, 2018:8). However, the influence of these developments, particularly with regard to humanistic perspective, on Population Geography was not as immediate as in other sub-disciplines of Human Geography.

In the meantime, the preoccupation of population geographers with distribution and composition – the so called 'traditional pattern orientation' in population geography – attracted severe criticism by some geographers towards the close of 1970s. The publication of two books – *Population Analysis in Geography* by Woods in 1979, and *A Population Geography* by Jones in 1981 – initiated a discussion on the need to reorder the emphasis in population geography. Woods and Jones emphasized that population should reflect process orientation, in line with the current trends in geography, with emphasis on population dynamics. Woods later suggested that the role of population geographers is 'not to describe the geography of population by emphasis on its distribution but to employ their spatial perspective in the analysis of demographic structures' (Woods, 1984:247). Criticising the broad definition, which makes population geography identical to human geography, Woods suggested that population geographers should redefine the core of the sub discipline and master the modern techniques. He suggested that spatial variation in mortality, fertility and migration, together with those of population distribution should form the core areas of the sub discipline. The period that followed, witnessed a reordering of emphasis and resultant significant contributions from population geographers in the areas of modelling and estimation, policy oriented research designed to assess the impact of

population programmes and causes of long term demographic changes (Woods, 1984:248). Population geography, thus became strongly demographic and moved in the direction of being redefined as *spatial demography* (Findlay, 1991:64).

Population geography's trajectory from the time of empiricism and positivism that had dominated academic discourse is marked with tremendous expansion and diversification under the influence of structuralism and humanism that swept all social sciences in the post-positivist period. Emphasis on diversity further got a boost in the 1980s from the philosophy of *postmodernism*. Postmodernism discarded all the grand theoretical perspectives and stressed upon individual experiences. For Human Geography it implied production of multiple spaces for diverse groups, thus, giving rise to *population geographies* rather than a single population geography (Barcus and Halfacree, 2018: 10).

However, it is also true that the impact of these theoretical debates on population geography was not as pervasive as in the case of other sub-branches of human geography. Empirical and quantitative analysis of demographic phenomena continued to dominate the academic discourse in the sub-field which invited severe criticisms from some geographers (see for instance Findlay and Graham, 1991; White and Jackson, 1995; Graham and Boyle, 2001) who called the mainstream discourse in population geography as 'methodologically conservative, neglecting theories and dominated by migration studies' (cited in Barcus and Halfacree, 2018, 12).

Development of Population Geography in India

The origin of population geography as a separate topical study in human geography in India can be traced back to the late 1950s. Geographers associated with Panjab University, Chandigarh, played a pioneering role in the development of the sub-discipline in the country. Over a short span of a little over half a century, population geography has grown into a major area of research and teaching in the overall scheme of systematic geography all over the country. Though some studies on population distribution and density by geographers did appear earlier, Gosal's doctoral work entitled *A Geographical Analysis of India's Population* in 1956, under the supervision of G. T. Trewartha, was the first systematic and comprehensive analysis of India's population in a geographical perspective (Krishan, 1997; Chandna, 2009). In early 1960s, Gosal initiated teaching and research in population geography at Panjab University, Chandigarh. Subsequently, the sub-discipline was introduced at graduate and post-graduate levels in several other universities. The first textbook on population geography '*An Introduction to Population Geography*', was brought out by Chandna and Sidhu, in 1980. The subsequent additions to the list of textbooks on population geography in the country include Chandna (1986, 1987), Lal (1988), Ojha (1989) and Hassan (2005 and 2020).

A cursory look at the content of the textbooks on the sub-discipline would reveal that population geographers in the country have generally shied away from demographic techniques and model building. Most of the studies on population in geography generally do not go beyond the description of spatial patterns in population attributes on which data are available through

secondary sources. The tradition of fieldwork in population geography has been conspicuous by its absence. Among various secondary sources, census publications have occupied the central position relating to population studies in geography in India.

To conclude, population geography in India has not only remained largely empirical-descriptive with some influence of positivism but has also responded very little to the development of social theories under structuralism, humanism, and post-modernism. According to Gosal, the actual accomplishments of the discipline are therefore incomplete in terms of both spatial spread and content (Krishan, 1997:75). It is essential, therefore, to cultivate a theoretical approach in research activities.

SAQ 3

Name the two books and their authors that criticise the traditional pattern orientation' in population geography.

1.5 SOURCES OF DATA WITH SPECIAL REFERENCE TO INDIA

On the basis of its nature, data are generally classified into two types – primary and secondary. While the former refers to data generated/ collected by the researcher through various forms of surveys specially designed for understanding and solving the research problem at hand, the latter includes data collected and compiled by other private and government agencies from time to time. The present section deals with data sources of the latter type.

Population geography is basically an empirical science as it is concerned with the regional differences in the earth's covering of people and their characteristics. Broadly speaking, students of population science are interested in two main aspects of population:

- (a) the state of the population at a given time in a given territory, including its regional distribution and its composition or structure.
- (b) the dynamics of the population in time and space as a result of combined effect of fertility, mortality, and migration.

Data pertaining to these two aspects are collected in two different ways. While in the case of first one, data are collected at a particular point of time, the second is based on recording of events on a continuous basis. The former, generally known as stock data, is represented by census and various other social surveys that provide information on size, distribution and social, demographic and economic attributes of the population. Likewise, the latter, is known as flow data and relates to the registration of such events as births, deaths and migration on a regular basis.

Population data are drawn from the following main sources:

1. The Census
2. Vital Statistics

3. Demographic Sample Surveys
4. Population registers
5. International Publications

1. The Census

The census is the single largest source of data for population studies all over the world. The word “census” is derived from the Latin word *censere* which means “to assess”. United Nations Study defines the *population census as the total process of collecting, compiling and publishing demographic, economic and social data pertaining to a specified time or times to all persons in a country or delimited territory*. In other words, enumeration of the entire population of a country or a region at a particular time is called a ‘census’. Thus, a census is an official count of a country's inhabitants with statistical information on place of residence, demographic characteristics (age, sex, marital status, number of children, literacy level, education level), economic activity, social characteristics (language, religion and caste and class migration).

Although the modern census is a phenomenon of the recent past – the 17th and 18th centuries - there is evidences of that censuses were conducted in various parts of the world during ancient times also. However, the purpose of such a census was very limited, i.e., it was for tax collection or military enlistment or both. The earliest example of a modern type of census is found in New France (modern Quebec) in Canada, in 1665 and Iceland in 1703. The first periodic census was started in the United States in 1790 and in Great Britain and France in 1802 (Cox, 1976; Woods, 1979). By the mid-19th century, almost all the European countries had developed the system. Today, almost all countries in the world, with a few exceptions (notably China), conduct censuses at regular intervals (Woods, 1979). Periodicity is an important feature of a census (Clarke, 1972) because census is taken at regular intervals. Most countries, including India, conduct a census every 10 years. Another characteristic feature of a census is simultaneity, which means that the entire population at a given time is counted simultaneously. Because a census counts all the people in a country or region, the actual process of count is spread over a period of time, such as a week or two weeks. However, the actual counts refer to a specific date and time, and this is called the *reference date, census date, or census time*. This is achieved by adjusting the figures for births, deaths, and migration that occur between the date of actual count and the reference date by conducting additional surveys shortly after the reference date. In the enumeration process, two approaches are adopted by the census. These are *de facto* and *de jure*. In the *de facto* approach, used in Australia for instance, every individual is recorded at the place where he or she is found at the time of enumeration. As against this, in the *de jure* approach, as in the United States, people are recorded at their normal or usual place of residence. In some countries, however, a combination of both the approaches is used, for instance in Brazil and England.

2. Vital Statistics

The data on vital events such as births, deaths, marriages, divorces, separations, annulment and adoption etc. are known as vital statistics. The

continuous recording of such data is known as the vital registration system or civil registration system. Although, the practice of collecting information on baptisms, burials, and marriages existed from much earlier time in Europe, the civil registration system did not come into existence until the 19th and 20th centuries. The first civil registration system was introduced in England and Wales in 1836 and in Scotland in 1854. However, Great Britain cannot be considered the birthplace of official vital statistics (Cox, 1976). Even before Great Britain, Sweden had a law for compilation of population records as early as 1748. This law provided for the regular recording of births and deaths along with other additional information for each parish. Scandinavian countries have had a continuous system of registering births, deaths, and marriages since the middle of 18th century.

In addition to data on vital events, the vital statistics also provide other additional information. For example, in the case of births, additional information is recorded on the sex of the child, the age of the mother, the number of her previous children, the order of birth, the place of residence of the parents, etc. Similarly, in the case of a death, information on the date and place of death, sex, age, and occupation of the deceased, and the cause of death are also recorded. Population statistics are an important tool for studying population dynamics in a country or region. As in the case of census data, vital statistics are also subject to significant inaccuracies in much of the world, particularly in developing countries, including India. Many of the developing countries still do not have a system for continuous registration of vital events. This poses a serious problem for a population geographer when mapping the world's patterns of vital events. The inaccuracy of data on vital events in developing countries due to poor coverage renders a researcher's attempt on the study of population dynamics a very difficult task.

3. Demographic Sample Surveys

Demographic sample surveys are another important source of demographic data. In sample survey, data are collected from selected samples and the extent of statistical errors in the data is minimized by regulating the size of samples. The data from sample surveys have several uses and have advantages over periodic surveys or full count. It requires a small number of employees or interviewers, and therefore it is cheaper. With the help of more qualified and accurate interviewers and properly designed questionnaires, information on some specific topics can be obtained in detail through sample surveys that are often not possible in periodic full counts. Data obtained through a sample survey are more reliable. Further, sample surveys can be conducted more frequently and the questions asked can be varied from time to time. Despite these advantages, sample surveys cannot replace complete counts. Sample surveys and periodic complete counts are essentially complementary to each other. Efficient sampling requires stratification and this can only be achieved only if there is a suitable frame of reference based on the recent complete number of several sort (Cox, 1976). Similarly, sampling becomes necessary at each stage of the census numeration - at the planning stage, during the investigation itself, in data processing and tabulation, and post-census check of data accuracy.

4. Population Registers

In the Scandinavian countries, and some other European countries like the Netherlands, Belgium and Finland, local registration bureaus maintain registers in which details about each individual are continuously recorded. These registers are known as *population registers* and they provide a comprehensive account of the changes that take place in population from time to time. In this system, a separate card for each individual is maintained from the time of his/her birth (or immigration) to his / her death (or emigration). On this card all the information pertaining to changes in the civil status, along with other details of socio-economic and demographic importance are continuously entered. Some non-European countries like Taiwan and Korea are also known to maintain such registers. The primary objective behind this system is to establish the identity of the individuals and to keep a vigil on them (Bhende and Kanitkar, 2011:56). Population registers, however, are an important source of wide range of population data ordinarily not available from both the census counting and the vital registration system. They also provide a very good account of the contribution of migration in population change of a country.

Sweden is said to be the first country to have started this system in the seventeenth century (Ramakumar, 1986:182). It is obvious that the population registers can be maintained more efficiently for small populations with a higher level of culture. However, even those countries, which maintain such registers, cannot afford to do away with periodic censuses. One of the disadvantages of the system is the fact that a register as detail as this might constitute an infringement on individual liberty (Petersen, 1975:29). That is why only a few nations attempt to maintain population registers in spite of the wealth of population data that they provide.

5. International Publications

The United Nations and its various organs, along with other international agencies such as World Bank, publish population data for the world and for different countries at regular interval. The most important of them is the *Demographic Year Book*, published by the UN. It provides data on such wide ranging topics as population size, area, density, percentage urban population, population growth, age-sex composition, number of births and birth rate, number of deaths and death rate etc. Sometimes the volume is devoted to special topics, which include fertility, mortality, marriage, divorce, migration, and population census statistics. The special volume includes detailed statistics regarding the topic. Besides, the UN also publishes the *Population and Vital Statistics Report* quarterly which includes latest data on total population, total mid-year population and estimate of population for a recent reference year (Srinivasan, 1998:56). Information on vital events includes total number of births, deaths, infant deaths, crude birth rates and crude death rates.

The United Nations Development Programme (UNDP) also publishes data on various social, economic and demographic aspects for the world and for different countries in its annual volume on *Human Development Report*. Other international publications on world population data include *Production*

Year Book of FAO, Year Book of Labour Statistics of ILO, Statistical Year Book of UNESCO, World Population Datasheet of Population Reference Bureau (PRB) and World Health Statistics Annual of World Health Organization (WHO). While the FAO publications provide information on agricultural population, the Labour Statistics of ILO gives detail data on the economically active population. Similarly, the UNESCO publication provides data on education, literacy and school attendance for different countries of the world. The monthly periodical of WHO presents data on public health and mortality for different countries of the world. Apart from these sources, the World Bank also publishes data on various demographic, social and economic aspects in its annual volume entitled *World Development Report*.

SAQ 4

Name the major sources of population data.

Population Data in India

As elsewhere in the world, data for population studies in India are obtained from census enumeration, vital registration and sample surveys. In the following sections a discussion on these sources and the nature of data is being presented.

Population Census

The first attempt to obtain the size of population in India was made during 1867-72. But this census counting was not synchronous, as it was not conducted at the same time in different parts. It did not cover the whole country also. However, as remarked later by Kingsley Davis, a famous demographer, this attempt was 'an auspicious beginning of census taking in India'. From 1881 onwards, census counting has taken place on synchronous basis at an interval of every ten years. The 2021 census enumeration could not take place due to Covid-19. The 2011 census was the fifteenth in the series and seventh after independence. Up to 1931, Indian census had adopted *de facto* approach wherein enumeration was undertaken throughout the country on a single night. Obviously, apart from being very costly this method required deployment of an extremely large number of enumerators. Hence, from 1941 onwards, we switched over to extended *de facto* canvasser method in which data is collected from every individual by visiting the household and canvassing the same questionnaire all over the country over a period of two to three weeks (RGI, 2011:4).

For a large and extremely diverse population like that in India, conducting a population census is a daunting task (Bose, 2001). Census enumeration is perhaps the largest administrative exercise in the world. The responsibility of conducting the decennial Census rests with the Office of the Registrar General and Census Commissioner, India under Ministry of Home Affairs, Government of India. Its main responsibility is to conceive, plan and implement Census taking in the country. It is a Union subject with the Ministry of Home Affairs in charge. A senior officer of the Administrative Services, with experience in census operation, is appointed as the Registrar General and

Census Commissioner. Similarly, for each state/ Union Territory an officer designated as Director of Census Operation is appointed. The responsibility of actual counting rests with thousands of enumerators who are drawn from primary and other schools, village 'patwari' (in case of rural areas) and local offices. An enumerator is required to visit every household within the area allocated to him for collecting required information. Indian Census Act of 1948 authorises the enumerators to ask the prescribed questions, and the respondents are legally required to furnish the details truthfully. The Act guarantees that the collected information will be confidential, and used only for statistical purpose, and not as evidence even in the court of law.

It may be of historical interest that though the population census of India is a major administrative function, the Census Organisation was set up on an ad-hoc basis for each Census till the 1951 Census. The Census Act was enacted in 1948 to provide for the scheme of conducting population census with duties and responsibilities of census officers. The Government of India decided in May 1949 to initiate steps for developing systematic collection of statistics on the size of population, its growth, etc., and established an organisation in the Ministry of Home Affairs under Registrar General and ex-Officio Census Commissioner, India. This organisation was made responsible for generating data on population statistics including Vital Statistics and Census. Later, this office was also entrusted with the responsibility of implementation of Registration of Births and Deaths Act, 1969 in the country.

The task of census taking begins with the notification of the government. A draft questionnaire is prepared and discussed in the 'Census Users' Conference' for finalisation. A pre-test in the form of pilot survey is undertaken all over the country before finalization of the questionnaire. Enumerators are appointed for the purpose and arrangements are made to provide training to enumerators along with all other functionaries. As a preliminary to the census counting, each house – residential or non-residential – is numbered and a list is prepared a few months prior to the actual enumeration. The house-list forms an important component of the enumeration as it provides frame for the actual counting. It is used for collecting data on housing and household amenities. In order to facilitate house-listing, detailed 'national maps' and layout charts of all villages and towns are prepared. Finally, on the day of counting, the enumerators visit the households in areas allocated to them and collect data with the help of specially designed schedules. At the time of 1991 census, 'household schedules' and 'individual slips' were used for the purpose. In the 2001 census, two schedules – one for 'house-listing' and another for 'population enumeration' were canvassed. The same was continued in 2011 also. For 2011 census, house-listing phase began on April 1, 2010, and continued up to September 30, 2010. 'Population enumeration' was undertaken during the period February 8-28, 2011. A revisional round, as part of post-enumeration check, was conducted during March 1-5, 2011 to adjust the figures for change taking place between the exact time of the visit of enumerator to the household and 00.00 hours of March 1, 2011. It may be noted that the census data pertain to a well-defined point of time called *census moment*. For 2011 census, 00.00 hours of March 1, 2011 was the census moment.

A Post Enumeration Check (PEC) is conducted immediately after the actual counting is over. This is designed to assess the level of accuracy of the count in terms of the 'coverage' and 'content' errors. Based on appropriate sampling procedures, PECs have formed an integral part of the census enumeration in the country since independence. PECs help in 'identifying areas that would need attention such as concepts and definitions employed, procedures of enumeration and related instructions to the field staff, etc. as well as in improving the conduct of future censuses. No attempts, however, are made to adjust the Census results based on the PES results' (RGI, 2011:25).

Soon after the actual counting is over, the census organisation gets involved in the task of tabulation and publication of data. Initially, the preliminary results are announced and 'provisional' tables on aspects of immediate interest to researchers and planners are released. The same for 2011 was released by the office of the Registrar General and Census Commissioner on March 31, 2011 with perhaps the shortest time lag between actual counting and publication in the census history of India (Navaneetham and Dharmalingam, 2011). This is followed by publication of detailed final results. The census data are brought out in different volumes or tables, of which the most commonly used by population geographers are Primary Census Abstract (PCA), General Population Tables (A-Series), General Economic Tables (B-Series), Social & Cultural Tables (C-Series), Migration Tables (D-Series), Fertility Tables (F-Series) and Special Tables for Scheduled Castes & Scheduled Tribes (SC & ST Series). These tables are published at two levels: while the office of the Registrar General publishes 'all India' volumes, which provide state-wise data, the Directorate of Census Operation publishes data pertaining to lower order administrative divisions i.e. districts, tehsils and blocks of the respective state.

Census provides data on a wide range of demographic, social and economic aspects. The demographic aspects on which data are available include size and distribution of population by sex and age for rural and urban areas separately. It also include some information on fertility aspects such as number of births during the preceding year to currently married women, and children ever born and surviving related to ever married women. On the social aspects the information provided pertain to distribution of scheduled castes and scheduled tribes, population by religion, languages spoken, marital status, levels of literacy and educational attainment etc. They are given for males and females in both rural and urban areas separately. Likewise, on economic characteristics, census provides data on workforce participation by sex and by broad age groups and distribution of workers in different industrial categories for males and females and for rural and urban areas, among others. These data are also available for scheduled castes and scheduled tribes separately. The 2001 census provided data on these economic characteristics along with levels of literacy and educational attainment for different religious groups also. This practice has continued in 2011 census also. The 2011 census has, for the first time, provided data on population of transgender in the country. It may also be noted that 2011 census has collected data on 'caste' also after a lapse of 80 years on demand from various walks of life. Census of India collected data on 'caste' up to 1931 and thereafter it was discontinued. Migration or spatial mobility holds a very

important place in the study on the dynamics of population change of any area. The census remains the single most comprehensive source of data on migration in the country. It provides data on volume of migration by sex and rural-urban status (both at the place of origin and the place of destination) on the basis of 'place of birth' and 'place of last residence' criteria. Migrants are further classified on the basis of 'duration of residence' at the place of enumeration. From the tables on migration data, a researcher can generate data on volume of migration in different streams and different distance categories. These are available for all the states/UTs and the districts of respective states. Besides, census also provides information on reasons of migration, which was started in 1981 census and has continued in subsequent censuses. Census also provides information on the characteristics of migrants in terms of their literacy status, levels of educational attainment, working status and distribution in different industrial categories at the place of destination for all the million-plus cities of India. In addition to the above, census also provides information on houses, household amenities and assets separately for female headed households and slum population.

Vital or Civil Registration in India

The system of registration of vital events such as births and deaths in India was introduced by the British government way back in the middle of the 19th century. It was, however, concerned mainly with mortality data. This was the time when the death rates were very high in India due to poor sanitary and public health conditions. Any improvement in sanitary conditions, therefore, required complete and accurate data on mortality rates. It was with this objective that the British government had introduced vital registration system. It was only in the then Central Provinces where a system of registration of births was also available as early as in 1866 (Bhende and Kanitkar, 2011:50). The Births, Deaths and Marriage Registration Act was promulgated in 1886 by the British government. The Act, however, covered only areas ruled by the British. Moreover, as registration under this law was purely voluntary, the act served very little purpose. Coverage and quality of data were very poor. Furthermore, as the system was concerned mainly with collection of data on epidemic and diseases, it served very little purpose for the study of dynamics of population change. The overall responsibility of recording and tabulation of data rested with the Sanitary Commissioner, and later with the Director of Health Services.

In the post-independence period, realising the importance of data on vital events in planning for social and economic development, the government took several remedial steps to improve the quality and coverage of civil registration system. In 1960, the responsibility of collection, tabulation and publication was shifted to the Registrar General who also looked after census operation in the country. The Registration of Births and Deaths (RBD) Act was passed in 1969 to promote uniformity, and to ensure comparability in the registration of vital events and compilation of statistics thereof. The act replaced all the diverse laws that existed on the subject prior to its enforcement, unified the system of registration and made reporting and registration of births and deaths compulsory in the country (Singh, 2004:2435). Thus, the act provided

for a compulsory registration of births, still births and deaths, and any failure to register such events was made punishable under the Act.

The Registrar General is the central authority in charge of the registration system. The responsibility of overall coordination, providing technical guidance and setting standards for uniform vital registration system in different parts of the country lies with the office of the Registrar General. The office of the registrar general is entrusted with the task of consolidation, tabulation and publication of data on vital events. However, implementation of the provisions of the RBD act is vested with the state governments, and registration of births and deaths is done by the functionaries appointed by the state governments. In each state there is a Chief Registrar who looks after the activities of civil registration. The actual registration of births and deaths is done by authorities as panchayat secretaries or station house officers (SHO) in the rural areas, and executive officers of the municipal councils/ Nagar Panchayats (municipal corporations have officers notified as registrars) designated as Local Registrars (LRs). Directorate of Census Operations of a state/ UT is sub-ordinate to the Office of the Registrar General, and it is responsible of monitoring of working of the Act. Recently, the directors of census operations have been designated as the ex-officio Joint Registrar Generals under Section 3(2) of the RBD Act. The office of the Registrar General publishes annual volume on 'Vital Statistics in India' which provides data on number of births and deaths, age of deceased persons, infant mortality rates, causes of deaths etc.

Despite the fact that any failure to register vital events has been made punishable, and that birth and death certificates are essential now a days in legal disputes, for instance disputes involving property, civil registration system in India is far from satisfactory. The data provided suffer from great amount of inaccuracy owing mainly to underreporting of the events. Illiteracy and ignorance among people regarding the importance of such data are the main problems for the magnitude of underreporting. This is more so in the rural areas of the country.

Sample Registration System

In order to make a more reliable and accurate data available on vital events, the government of India introduced several measures during the Third Five year Plan. One among them was the introduction of a system, known popularly as 'Sample Registration System' (SRS). The SRS data on births and deaths are more reliable, and are based on the technique of 'dual report system'. In this, information about births and deaths are collected on a continuous basis from a sample of villages/ urban blocks by a resident part-time enumerator who is usually an anganwadi worker/ teacher. Then every six months a full time supervisor, generally a regular staff of State Directorate of Census Operations conducts an independent retrospective survey of the area. The data obtained through these two operations are matched. The unmatched and partially matched events are verified in a visit to the concerned household either by a third person or jointly by the enumerator and supervisor. Thereafter, an unduplicated count of births and deaths is obtained. The SRS provides estimates on births and deaths for various states and union territories for rural and urban areas separately. In addition, it also

provides data for other measures of fertility and mortality viz. total fertility rate, infant and child mortality rates etc. at higher geographical levels.

Sample Registration System was initiated by the office of the Registrar General of India (RGI) on a pilot basis in some selected states in 1964-65. The system became fully operational during 1969-70 covering about 3700 sample units. Just as in the case with civil registration system, the office of the Registrar General of India is the central monitoring authority. The Vital Statistics Division of RGI formulates and prescribes necessary standards, provides necessary instructions and guidance, and undertakes tabulation, analysis and dissemination of data. Results are published in the form of SRS Statistical Report annually and SRS Bulletin twice in a year i.e. in June and October. The sampling frame of SRS is revised every 10 years based on the results of latest census. While doing so issues like modification in the sampling design, wider representation of population, overcoming the limitations in the existing scheme, meeting the additional requirements etc. are taken into account (RGI, 2016:1). The first replacement of sampling frame after the introduction of the system took place in 1977-78 while latest one was undertaken in the year 2014.

The sample unit in the system in rural areas is a village or a segment of it if the population of the village is 2000 or more. Smaller villages with a population size of less than 200 persons are excluded from the frame. Likewise, in the case of urban areas, the sample unit is a census enumeration block. At present, SRS covers a total of 8,853 sample units – 4,961 in rural areas and 3,892 in urban areas – in all the states and union territories of the country.

Sample Surveys

Apart from the sources discussed above, there are several socio-economic and demographic sample surveys conducted from time to time, by various government and non-government agencies. They provide useful information on different aspects of population ordinarily not available in the census or vital registration system. Three of them deserve special mention here – the National Sample Surveys (NSS), the National Family Health Surveys (NFHS) and the District Level Household Survey (DLHS).

In 1950, the government of India set up a large scale sample survey agency known as NSS (National Sample Survey) with an objective of collecting comprehensive data pertaining to various social, demographic and economic aspects, on a regular basis, through sample surveys on a nation-wide scale. Initially, much of the works related to surveys was entrusted to the Indian Institute of Statistics. However, in 1970 all aspects of survey related work were brought under one organization namely National Sample Survey Organisation, now called National Sample Survey Office (NSSO) under the overall technical guidance of Governing Council. The NSSO comes under the jurisdiction of Ministry of Statistics and Programme Implementation, and is headed by the Director General and Chief Executive Officer (DG & CEO) who is responsible for coordinating and supervising all activities of the organization in assistance of a small secretariat called Co-ordination and Publication Division (CPD). Ever since its inception in 1950, NSSO has been a very

important source of data on select aspects at the national and state levels separately for urban and rural areas. In NSS data are collected in its various rounds from samples drawn from different NSS regions. Each state is divided into one or more NSS regions, which are homogenous in terms of agro-climatic and socio-economic conditions. A proper representation is given to rural and urban areas. Each round in the NSS covers a group of topics related to economic conditions in the country on which data are collected from the field and processed. Some of these rounds cover population related topics also. The topics covered so far include, among others, births, deaths, morbidity, population growth, family planning, maternal and child care, details on physically handicapped persons, employment and unemployment, urban labour force, consumer expenditure patterns and poverty, housing conditions, literacy and participation in education etc.

The first round of the NSS was conducted during the period Oct. 1950 to March 1951, and so far seventy one rounds have been conducted. Currently, NSSO is involved in its 72nd round, which is devoted to the survey of service sector excluding trade and finance. Up to the thirteenth round, the duration of the survey varied from 3 to 6 months (9 months in the case of eighth and thirteenth rounds). From fourteenth round onwards, the duration of the survey work has been extended to one year with the exception of twenty-eighth, thirty-sixth, forty-seventh, forty-ninth and fifty-fourth rounds. While the twenty-eighth round was spread over a period of nine months, the remaining covered six months only. From twenty-seventh round onwards quinquennial survey covering a larger number of households is conducted every five years. The last quinquennial survey was the fifty-fifth round conducted during July 1999 – June 2000.

Availability of a reliable set of data on demographic and health outcomes at both national as well as state level is indispensable for formulation of effective policy measures. Introduction of **NHFS** (National Family Health Survey), a Ministry of Health and Family Welfare project funded by the United States Agency for International Development (USAID), with its first round in 1992-93, was a landmark event in this direction. It provided invaluable data for researchers, planners and policy makers on population, health and nutrition with an emphasis on women and young children. So far, four rounds of the surveys have been conducted in the country. Population Research Centres in different states and union territories in collaboration with selected Consulting Organisations or Field Organisations undertook the task of data collection. The International Institute for Population Sciences (IIPS), Mumbai, is designated as the nodal agency to coordinate the process of data collection in different states

Based on uniform questionnaires and methods of sampling, NFHS provides an invaluable database on demographic and health-related parameters at national and state levels. The data collected in the NFHS are of a very high quality and are comparable with those of the Demographic and Health Surveys (DHS) conducted in many other countries. The DHS programme is an international project designed to collect comparable survey data across countries on fertility, family planning and, maternal and child health (IIPS, 1993: 11). In each successive stage, the quality and coverage of data have undergone marked improvements. Some of the issues covered in the first

round of the survey (NFHS-1) were fertility and nuptiality, infant and child mortality, the practice of family planning, maternal and child health care and utilization of services provided for mothers and children. Along with estimates on these aspects, NFHS-1 also provided data on demographic and socio-economic determinants of fertility, family planning, and maternal and child health. In addition, the second round of the survey (NFHS-2) that was conducted in 1998-99, provided information on nutritional status of women and the prevalence of anaemia among ever married women and their children below age three in the country. It also provided data on the quality of health and family welfare services, women's reproductive health problems, and domestic violence, along with information on the status of women, education and the standard of living. Along with the rural-urban estimates on select indicators, NFHS-2 provided regional estimates for five states (Bihar, Jammu and Kashmir, Madhya Pradesh, Rajasthan and Uttar Pradesh), separate estimates for three metro cities (Chennai, Kolkata and Mumbai) and estimate for slum areas in Mumbai. The third round (NFHS-3) conducted in 2005-06 still covered much larger issues than the previous surveys. For the first time, a separate module for men in the age group 15-45 was included and sensitive issues like sexual behaviour were covered in the survey (Rajan and James, 2008:33). NFHS-4 conducted in the year 2015-16, was based on a much larger sample size than that in the previous three rounds covering all the six union territories in addition to the 29 states. NFHS-4 provides for the first time estimates of most of the indicators at district level for all 640 districts as per the 2011 census. This round of the survey has covered a range of health-related issues, including fertility, infant and child mortality, maternal and child health, perinatal mortality, adolescent reproductive health, high-risk sexual behaviour, safe injections, tuberculosis and malaria, non-communicable diseases, domestic violence, HIV knowledge and attitude towards people with HIV (IIPS, 2017). NFHS-5 conducted in 2019-21 is the latest in the series made further extension by including death registration, pre-school education, expanded domains of child immunization, components of micro-nutrients to children, menstrual hygiene, frequency of alcohol and tobacco use, additional components of Non-Communicable Diseases (NCDs), expanded age range for measuring hypertension and diabetes among all aged 15 years and above.

The Government of India introduced **Reproductive and Child Health (RCH)** programme in 1996 towards the overall goal of target-free, client-oriented and demand-driven approach in family welfare programmes. An effective monitoring of RCH and formulation of appropriate strategies required micro-level level data on utilisation of services provided by the government. The Ministry of Health and Family Welfare, therefore, introduced DLHS with its first round of survey, known as RCH-I, in 1998-99. Subsequently, three more rounds of survey have been completed so far. The first two rounds were known as RCH-I & RCH-II (held in 2002-04), while third was called DLHS-3 and conducted in 2007-08. The latest round of the survey was conducted in 2011-12 and is known as District Level Household & Facility Survey-4. International Institute for Population Sciences is the nodal agency for carrying out this national survey also. DLHS in its various rounds has included aspects like coverage of ante-natal care (ANC) & immunization services, safe deliveries, JSY beneficiaries, contraceptive prevalence rate, unmet need for

family planning, awareness about RTI/STI&HIV/AIDS and accessibility, utilisation and adequacy of health facilities.

In addition to the sample surveys discussed above, there are several adhoc sample surveys, which provide demographic data for different regions in the country. They include surveys conducted by the Institute of Politics and Economics, Pune (1952-56), the Mysore Population Study (1953), the Patna Demographic Survey (1955) and the Family Planning Survey conducted by Operation Research Group (1970) among others (Bhende and Kanitkar, 2011).

SAQ 5

Name the different series of tables and associated attributes published by Census of India

1.6 SUMMARY

In this unit you have studied:

- Population geography is a relatively new sub-field of human geography. Within a short period of over half a century it has grown into a major area of teaching and research in human geography.
- However, population geography in India has remained largely empirical-descriptive in nature with some influence of positivism and has responded very little to the development of social theories under structuralism, humanism, and post-modernism. The actual accomplishments of the discipline are therefore incomplete in terms of both spatial spread and content (Krishan, 1997). It is essential, therefore, to cultivate a theoretical approach in research activities.
- The teaching and research in population geography by and large revolves around the main attributes of human population i.e. size and distribution, including the population distribution between rural and urban areas, growth and socio-economic and biological characteristics.
- Population dynamics include historical and contemporary patterns of population increase and its spatial manifestation; factors influencing population change, such as fertility, mortality, and migration, structure and composition of the population. Demographic characteristics, social characteristics and economic characteristics form important concerns of population geographers.
- In addition to the aforementioned, a population geographer is also concerned with policies and programmes intended to regulate population size and its attributes because government policies and measures in a country have a substantial impact on population and its varied attributes. The relationship between population density and economic growth is fairly close. Population growth is typically seen as a barrier to a nation's ability to advance economically. In recent times, the rapid population growth in many parts of the world has also been linked to declining environmental quality. However, the nature of the exact relationship between population

growth, on the one hand, and economic development and environmental degradation, on the other varies significantly from one region of the world to another depending on various demographic, social and economic factors in relation to spatial variations. Therefore, a population geographer's general focus also includes these and related problems.

1.7 TERMINAL QUESTIONS

1. Define Population Geography by Trewartha and Clarke.
2. Describe the Development of Population Geography in India.
3. Explain scope and relevance of population geography
4. Discuss in detail main sources of population data with special reference to India.
5. Discuss the Development of Population Geography in World.

1.8 ANSWERS

Self-Assessment Questions (SAQ)

1. a) It implies the investigation into human covering of the earth and its various facets with reference to physical and cultural environment.
b) Size and distribution including the rural-urban distribution of population. Population dynamics and Population composition and structure
2. Scopes of population geography are distribution and density of population, growth of population, composition of population, rural and urban populations, literacy and quality of the population, migration, and technological development and population resources ratio.
3. "Population Analysis in Geography" by Woods and "A Population Geography" by Jones.
4. (i) The Census; (ii) vital statistics; (iii) demographic sample surveys; (iv) population registers; (v) international publications.
5. General Population Tables (A-Series), General Economic Tables (B-Series), Social & Cultural Tables (C-Series), Migration Tables (D-Series), Fertility Tables (F-Series) and Special Tables for Scheduled Castes & Scheduled Tribes (SC & ST Series).

Terminal Questions

1. Refer to Section 1.2.
2. Refer to Section 1.4.
3. Refer to Section 1.3.
4. Refer to Section 1.5.
5. Refer to Section 1.4.

1.9 REFERENCES AND FURTHER READING

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POPULATION DISTRIBUTION |

Structure

- | | |
|------------------------------------|--------------------------------------|
| 2.1 Introduction | 2.7 Rural-Urban Distribution of |
| Expected Learning Outcomes | Population: Global and Indian |
| 2.2 Distribution Pattern of World | Scenario |
| Population | 2.8 Urbanization: Meaning, |
| 2.3 Factors Determining Population | Processes and Factors |
| Distribution | 2.9 Trend of Urbanization: Global |
| 2.4 Concept and Measures of | and Indian Perspectives |
| Population Distribution and | 2.10 Global Patterns of Urbanization |
| Density | Level |
| 2.5 Global Pattern of Population | 2.11 Spatial Patterns of |
| Density | Urbanization Level in India |
| Population Density Zones | 2.12 Summary |
| 2.6 Patterns of Population | 2.13 Terminal Questions |
| Distribution and Density in | 2.14 Answers |
| India | 2.15 References and Further |
| | Reading |

2.1 INTRODUCTION

We all by and large know that human population is distributed unevenly across the globe. Among different parts of the world, some are sparsely populated and some are densely populated due to a variety of unfavourable and favourable geographical factors. This is true at all spatial levels, be it a continent, country, state, district, revenue circle, town or village. The variation in the degree of unevenness in the population distribution is, however, considerably low within each geographical region with somewhat homogeneous geographical characteristics, viz. River valley plain, mountainous region, coastal region, monsoon region, desert region, etc. Such patterns of variation in population distribution may also be seen from the maps showing population distribution in different parts of the world.

An attempt is made in this unit to acquaint the learner about the patterns of population distribution across the world and India along with the discussion on measures of population distribution, population density zones and factors influencing distribution. Besides, the processes and patterns of urbanization are also discussed briefly at both global and Indian contexts.

Expected Learning Outcomes

After studying this unit, you should be able to:

- Describe distribution pattern of population including density zones in the world and India
- Explain the concept and measures of population density
- Discuss the factors responsible for uneven distribution of population
- Explain the concept of urbanization, spatial pattern of urbanization level in the world and India and factors associated with its spatial variation .

2.2 DISTRIBUTION PATTERN OF WORLD POPULATION

The population of the world which has reached 7.94 billion mark as in April 2022 is very unevenly distributed in its different parts. Among the countries, the population size as per 2020 estimate varies from as small as 801 in Holy See to as large as 1,439 million in China. Again, among the continents, it varies between 43 million in Oceania and 4,641 million in Asia constituting respectively 0.55 per cent and 59.54 per cent of the world's total population (Table 2.1). Among the 10 most populous countries of the world which together constitutes 57.76 per cent of the world's population, 6 countries, viz. China, India, Indonesia, Pakistan, Bangladesh and Russia are largely in the most populous continent of Asia (Table 2.2).

So far population distribution in relation to level of socio-economic development is concerned, as large as 6.42 billion (83.55 per cent of global population) is concentrated in the developing countries as against 1.26 billion (16.45 per cent of global population) in the more developed countries (Table 2.3). Another glaring picture of uneven distribution of global population can be seen with respect to latitude, a most important determinant of global climatic variation. It may be pointed out that more than 90 per cent of the world's population is confined to the northern hemisphere and the remaining less than 10 per cent in the southern hemisphere. Within northern hemisphere also, there exists sharp variations in the spatial concentration of population. For instance, 0°-20°N latitudinal zone accounts for 10 per cent of global population, 20°-40°N zone more than 50 per cent population with major concentration in Asia, 40°-60°N latitude zone 30 per cent population with large concentration in Europe, and beyond 60°N latitude around 1 per cent population (Chandna, 2014). In this context once Trewartha (1969) estimated that about half of the world's population occupied less than 5 per cent of total area and the remaining half of the population was spread across more than 60 per cent of the area. According to Clarke (1972), about two-third of the world's population lives within a height of 500m above sea level.

The unevenness in the distribution of world population can also be seen in the form of four major clusters, two in Asia and one each in Europe and North America, which constitute about three-fourth of the world's population (Fig. 2.1). Among these population clusters, the largest one constituting about one-fourth of the world's population is southern Asia largely comprising India, Pakistan, Bangladesh and Sri Lanka; the second largest one with around

another one-fourth population is eastern Asia comprising China, Japan South Korea and Taiwan; the third considerably large cluster with about one-fifth population is western Europe largely comprising UK, Germany, France, Netherlands, Belgium, Switzerland, Austria, etc; and the fourth smallest cluster with about 5 per cent population is largely eastern part of USA. In terms of latitudinal extent, the first population cluster is in sub-tropical zone, the second in tropical zone, and the third and fourth in mid-latitudinal zone. So far the predominant economic bases of the four population clusters are concerned, the first two of Asia largely characterised by fertile river valleys have traditional agricultural base, and the other two of Europe and the USA with rich mineral resource base have rich industrial developments. In fact, the contrasts in population distribution are more common in micro-level. For instance, the eastern part of China is highly crowded than its so thinly settled western part; the coastal areas of Japan are much more crowded than its interior mountainous areas; and the fertile Indo-Gangetic and coastal plain areas of India are thickly populated as compared to the hilly and mountainous areas of the Himalayan and Peninsular plateau regions.

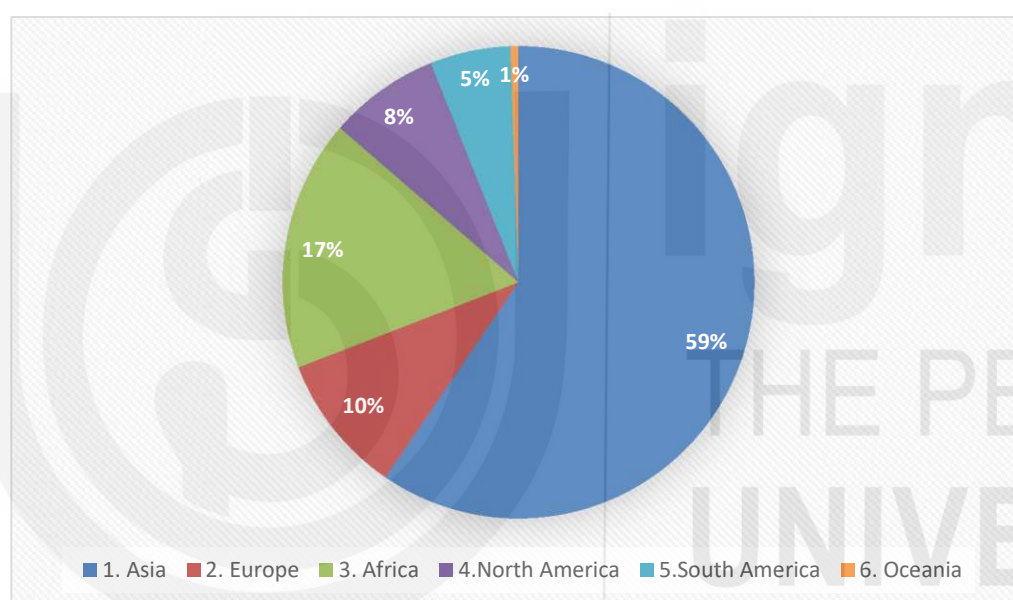


Fig. 2.1: General Distribution of Population, 2020.

Table 2.1: Distribution of Population in the World at Continent Level in Relation to Respective Area, 2000-2050.

Continent	Area (in million km ²)	Population		
		2000	2020	2050
1. Asia	44.6 (29.93%)	3,741,263,352 (60.90%)	4,641,054,786 (59.54%)	5,290,263,119 (54.34%)
2. Europe	10.9 (7.32%)	725,558,028 (11.81%)	747,636,045 (9.59%)	710,486,326 (7.30%)
3. Africa	30.1 (20.20%)	810,984,232 (13.20%)	1,340,598,113 (17.20%)	2,489,275,439 (25.57%)
4. North America	24.3 (16.31%)	485,851,217 (7.91%)	592,072,204 (7.60%)	696,160,813 (7.15%)
5. South America	17.8 (11.95%)	348,411,890 (5.67%)	430,759,772 (5.52%)	491,471,869 (5.05%)
6. Oceania	8.1 (5.44%)	31,425,087 (0.51%)	42,677,809 (0.55%)	57,376,334 (0.59%)

7. Antarctica	13.2 (8.85%)	-	-	-
World (Land Area)	149.0 (100.00%)	6,143,493,806 (100.00%)	7,794,798,729 (100.00%)	9,735,033,900 (100.00%)

* The figures within brackets indicate proportion of total land area and total population respectively.

(Source: Calculated based on data from <https://statisticstimes.com> (downloaded on 15th April, 2022))

Table 2.2: Population, Percentage Share of Population and Population Density in Top 10 Populous Countries of the World, 2020.

Country	Population (As per 2020 Estimate)	Percentage Share of Land Area	Percentage Share of Population
1. China	1,439,323,776	6.30	18.47
2. India	1,380,004,385	2.00	17.70
3. USA	331,002,651	6.14	4.25
4. Indonesia	273,523,615	1.22	3.51
5. Pakistan	220,892,340	0.52	2.83
6. Brazil	212,559,417	5.61	2.73
7. Nigeria	206,139,589	0.61	2.64
8. Bangladesh	164,689,383	0.09	2.11
9. Russia	145,934,462	10.99	1.87
10. Mexico	128,476,461	1.30	1.65
World	7,794,798,739	100.00	100.00

(Source: Worldometer of Population (downloaded on 15th April, 2022))

Table 2.3: Population and Percentage Share of Population in Developing Countries and More Developed Countries of the World, 2019.

Country	Population (As per 2019 Estimate)	Percentage Share of Population
1. Developing Countries	6,417.9 million	83.55
2. More Developed Countries	1,263.4 million	16.45
World	7,681.3 million	100.00

(Source: Human Development Report, 2022 (downloaded on 15th April, 2022))

SAQ I

What are the major clusters of population in the world? Which one among them constitutes largest share of world population?

2.3 FACTORS DETERMINING POPULATION DISTRIBUTION

The marked regional contrasts in population distribution as observed in the above discussion are associated with a variety of physical, socio-economic and demographic factors. The role of these factors towards determining distribution of population is discussed below.

Physical Factors

Among the physical factors that influence distribution pattern of population in an area, physiography, climate, soil, forest cover, water, energy and mineral resources, etc are considered very important.

The physiographic characteristics as reflected by various landforms, viz. mountain, hill, plateau, plain, etc greatly influence the distributional pattern of population at both macro and micro levels. Rugged nature of terrain along with high altitude, steep slope, high drainage density, thin soil surface, deep water table, etc acts negatively towards supporting large population. On the other hand, levelled land with low altitude, very gentle or almost zero slope, low drainage density, deep and rich soil surface, very shallow water table, etc can support large population. In view of such a situation highly rugged mountainous areas of Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Arunachal Pradesh in the Himalayan region are found to be very sparsely populated as compared to the very densely populated fertile plain areas of Uttar Pradesh, Bihar, West Bengal, Assam, Kerala, etc. In this respect, Clarke (1972) observed that about 56 per cent of the world's population was confined to an altitude of below 200m from the sea level (Chandna, 2014). Hence, in view of the inherent constraints of the highland areas there exists an inverse relationship between altitude and population density.

The type of climate as largely characterised by temperature condition and precipitation pattern including the associated length of growing season also greatly influences the spatial concentration of population in any area. In fact, the areas having favourable climatic condition for both human habitation and cultivation attract more population. According to Trewartha, as the cold deserts, the hot deserts and the wet tropics experience extreme climatic condition, such areas are very sparsely populated. On the other hand, the monsoon areas of India being largely characterised by moderate temperature and high rainfall with seasonal variations witness high concentration of population as compared to the areas of temperate climate in Europe and Asia.

The spatial concentration of population in an area also depends partly on soil quality. The hill soil, the podzolic soil of higher middle latitudes and lateritic soil of the tropics do not attract more human settlements due to their much lower productivity. On the other hand, the deep alluvial soils of the river valleys and coastal plains, lava soils of volcanic regions, and grassland soils of the sub-tropical and mid-latitude regions witness high concentration of population due to their highly rich soil quality for agriculture. In view of this, the Indo-Gangetic plain, the coastal deltaic regions of Southern India and Eastern China, and the areas of rich volcanic soils of Japan and Java (Indonesia) can support very high concentration of population. However, it is difficult to find out the precise role of soil quality as a factor of population distribution in an area, because the variation in soil quality is also closely associated with differences in geological structure, landform, climate and vegetation.

The vegetation cover in the form of particularly forest influences distribution pattern of population both positively and negatively. The presence of dense

forest cover in the equatorial and tropical regions negatively influences population concentration, as it hinders or limits growth of settlements in such area. On the other hand, dense forest cover influences positively by arresting soil erosion and supporting huge population in the neighbourhood areas through its rich bio-resources. Thus, the process of limiting space for human settlements due to large expanse of forest cover combined with availability of diverse forest resources contributes to increase in spatial concentration of population in the neighbourhood of rich forests and wildlife habitats.

Availability of energy and mineral resources in an area always encourages human settlement there. In fact, such a situation along with development of transport connectivity brings about industrialization and urbanization, and results in fast growth of population in the area. The high concentration of population in the industrial areas of Great Britain, France, Germany, Poland, USA, Western part of Russia, Australia and Chhotanagpur region of India has been largely associated with availability of coal and many other important mineral resources there.

The areas having abundant supply of water for daily use, industrial use and agricultural practices are found to be densely populated. In view of vital importance of water for various purposes including even water transport, the ancient civilizations of the Indus and the Nile valleys originated on the banks of the respective rivers, and became densely populated. On the other hand, the scarcity of water in the midst of harsh climate has kept most parts of Sahara desert areas very sparsely populated.

Socio-Economic Factors

Although physical factors play a decisive role in the distribution of population of an area, the contribution of socio-economic factors including transport accessibility is no less significant in this respect. The capability of an area to attract and support population may also be dependent on development of transport network. Hence, any area having connected through several modes of transport is more densely populated. Similarly, the areas with high degree of industrialization and urbanization along with growing facilities of education and health and high carrying capacity emerge as large concentrations of population. Such areas also experience large volume of migration from rural and urban areas of the country and outside. Sometimes due to the administrative decisions of the government concerned, division of country's boundary and outbreak of ethnic and geopolitical conflicts result in redistribution of population in different parts of the world. Such a phenomenon in turn contributes to dispersal of population in one area and clustering of population in another.

Demographic Factors

The distribution pattern of population in an area is also influenced by demographic factors like fertility, mortality and migration. There exists marked variation in natural growth rate of population in different parts of the world caused by varying differential in birth rate and death rate. In this respect, the contribution of the developing countries of Asia and Africa including India, Pakistan, Nigeria, etc having considerably high natural growth rate has been highly significant, and as a result these areas continue to increase their

population clustering. On the other hand, many of the countries of the developed world, such as Australia, Canada, USA, New Zealand, Russia, etc have remained very sparsely populated due to the prevalence of very low natural growth rate of population.

SAQ 2

Why are the river valleys of the world densely populated?

2.4 CONCEPT AND MEASURES OF POPULATION DISTRIBUTION AND DENSITY

Although both distribution and density of population largely refers to spatial variation in the concentration of population in an area, the distribution basically means how every individual occupies given space, and density means number of individuals living per unit area of the given space. In other words, while distribution is concerned with pattern of spatial spread of population, the density is simply nothing but man-land ratio.

So far the measure of population distribution is concerned, the most simple way is percentage distribution of population. For instance, if we want to show percentage distribution of population in each and every state and union territories (UT) of India, we have to calculate the same by dividing the population of the State or UT by total population of the country and multiplied by 100. However, the best way to depict a more realistic pattern of distribution of population in an area is through dots. The picture of distribution pattern of population in an area may also be understood through application of centrophagic measures.

The density of population, which estimates pressure of population on land, is calculated by dividing population of an area (a district, state, etc) by its geographical area, and it is expressed as number of persons per km² or per sq. mile. This density measure of population is also called Arithmetic Density of Population, and here the population needs to be divided by total area of the spatial unit, whether entire area is inhabited by people or a large portion of the area is under forest or wetland. In view of this limitation in arithmetic density of population, a few more measures of population density, viz. Physiological density of population, agricultural density of population, nutritional density of population and economic density of population have been introduced. These are discussed below.

Physiological Density of Population: It is nothing but population of a spatial unit divided by Area under cultivation of that spatial unit, i.e. persons/km².

Agricultural Density of Population: It is nothing but agricultural population of a spatial unit divided by Area under cultivation of that spatial unit, i.e. persons/km².

Nutritional Density of Population: It is nothing but population of a spatial unit divided by Area under foodgrain cultivation of that spatial unit, i.e. persons/km².

Economic Density of Population: It is a ratio between the requirements of a population of a spatial unit (Product of number of inhabitants in the area and per capita quantity of requirements) and the quantity of resources made available to it through production in the same spatial unit (Product of the area in sq km and quantity of resources produced per km²).

Besides the above, there is another measure of population distribution called Population Concentration Ratio or Population Concentration Index. Population concentration ratio is basically a relative measure, wherein the proportion of population of an area is compared with the corresponding proportion of geographical area of the same. Accordingly, in the case of uniform population distribution, both the proportions of population and geographical area would be the same, and the value of population concentration as such becomes 1. Hence, higher the value of population concentration above 1, the higher will be the degree of concentration. This concept of relative concentration of population is exactly the same, when we find out the ratio between population density of an individual spatial unit and population density of the entire area.

SAQ 3

- Define density of population with an example. Distinguish between arithmetic density and physiological density.
 - What is population concentration ratio? What could be its unit and range of values?
-

2.5 GLOBAL PATTERN OF POPULATION DENSITY POPULATION DENSITY ZONES

The unevenness in the distribution of population across the world is very much reflected in the density of population, which varies significantly from the average population density of 52 persons per km² in the world depending on variation in terrain condition, soil fertility for agricultural practices, resource availability, economic development and transport connectivity. So far the population density (persons/km²) at continent level is concerned, it is found to vary from as low as 5 in Oceania to as high as 104 in Asia (Table 2.4). It thus indicates that the degree of variation in population density is considerably low at macro level among the continents. On the other hand, if the variation in population density at country level (meso level) within the most densely populated continent of Asia is taken into consideration, it is found to vary between as low as 2 in Mongolia and as high as 8,358 in Singapore. Even among the top 10 countries of the world, the population density varies between 9 in Russia and 1,265 in Bangladesh (Table 2.5 and Fig. 2.2). Similarly, at micro level there exists marked variation in population density among the states within a country, or between rural and urban areas.

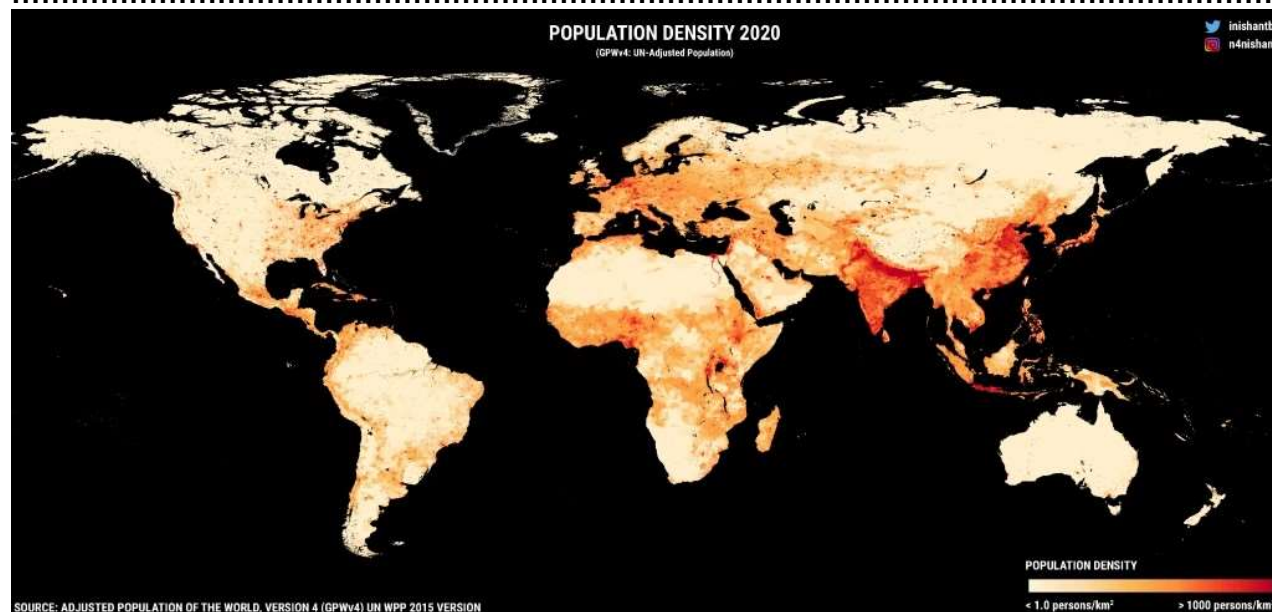


Fig. 2.2: Population Density Pattern in the World, 2020.

Table 2.4: Population Density at Continent Level in the World, 2000-2050.

Continent	Population Density (Persons/km ²)		
	2000	2020	2050
1. Asia	84	104	119
2. Europe	67	69	65
3. Africa	27	45	83
4. North America	20	24	29
5. South America	20	24	28
6. Oceania	4	5	7
World	41	52	65

(Source: Calculated based on data from <https://statisticstimes.com> (downloaded on 15th April, 2022))

Table 2.5: Population, Percentage Share of Population and Population Density in Top 10 Populous Countries of the World, 2020.

Country	Population Density (Persons/km ²)
1. China	153
2. India	464
3. USA	36
4. Indonesia	151
5. Pakistan	287
6. Brazil	25
7. Nigeria	226
8. Bangladesh	1,265
9. Russia	9
10. Mexico	66
World	52

(Source: Worldometer of Population (downloaded on 15th April, 2022))

SAQ 5

Which one of the following is the correct sequence of declining population density?

- (a) Nigeria-Bangladesh-China-India
- (b) Bangladesh-India-Nigeria-China
- (c) Bangladesh-Nigeria-India-China
- (d) India-Bangladesh- China- Nigeria

2.6 PATTERNS OF POPULATION DISTRIBUTION AND DENSITY IN INDIA

As discussed above, the distribution of population in India is also quite uneven. It is basically due to varied physiographic characteristics and many other associated physical and socio-economic factors. Among the major physiographic divisions of the country, the Indo-Gangetic-Brahmaputra plain is characterised by the largest cluster of population in India constituting around 42 per cent of the country's population; followed by the southern Peninsular plateau including coastal plain region with a moderate population constituting country's 37 per cent; and the Himalayan mountainous region stretching from Kashmir to north-eastern mountain region with a sparse population constituting merely country's 3 per cent respectively as per 2011 Census representing country's total area of 20 per cent, 47 per cent and 12 per cent (Fig. 2.3). Accordingly, the population concentration ratios of these three physiographic regions are found to be 2.1, 0.8 and 0.2. Besides, the observed uneven distribution of population is also clearly reflected in the density of population, which is found to be the highest in the Indo-Gangetic-Brahmaputra plain (780/km²), followed by southern Peninsular plateau including coastal plain region (290/km²) and the Himalayan mountainous region stretching from Kashmir to north-eastern mountain region (90/km²).

Table 2.6: Distribution of Percentage Share of Population, Population Concentration and Population Density in India at State/UT Level, 2011.

State/Union Territory	Percentage Share of Population	Population Concentration	Population Density (Persons/km ²)
1. Uttar Pradesh	16.49	2.17	828
2. Maharashtra	9.29	0.95	365
3. Bihar	8.58	2.88	1,102
4. West Bengal	7.55	2.69	1,029
5. Madhya Pradesh	6.00	0.62	236
6. Tamil Nadu	5.96	1.45	555
7. Rajasthan	5.67	0.53	201
8. Karnataka	5.05	0.83	319
9. Gujarat	4.99	0.81	308
10. Andhra Pradesh	4.08	0.81	308
11. Odisha	3.47	0.70	269
12. Telangana	2.91	0.82	312
13. Kerala	2.76	2.25	859
14. Jharkhand	2.72	1.08	414
15. Assam	2.58	1.04	397
16. Punjab	2.29	1.45	550

17. Chhattisgarh	2.11	0.49	189
18. Haryana	2.09	1.5	573
19. Delhi*	1.38	29.57	11,297
20. Jammu & Kashmir	1.04	0.32	124
21. Uttarakhand	0.84	0.49	189
22. Himachal Pradesh	0.57	0.32	123
23. Tripura	0.30	0.92	350
24. Meghalaya	0.24	0.34	132
25. Manipur	0.22	0.32	122
26. Nagaland	0.16	0.31	119
27. Goa	0.12	1.03	394
28. Arunachal Pradesh	0.11	0.04	17
29. Puducherry*	0.10	6.80	2,598
30. Mizoram	0.09	0.14	52
31. Chandigarh*	0.09	24.22	9,252
32. Sikkim	0.05	0.22	86
33. Andaman & Nicobar Islands*	0.03	0.12	46
34. Dadra & Nagar Haveli*	0.03	1.83	698
35. Daman & Diu*	0.02	5.67	2,169
36. Lakshadweep*	0.01	5.27	2,013
India	100.00	1.00	382

*Union Territories

(Source: Calculated based on Primary Census Abstract, India, Census of India, 2011)

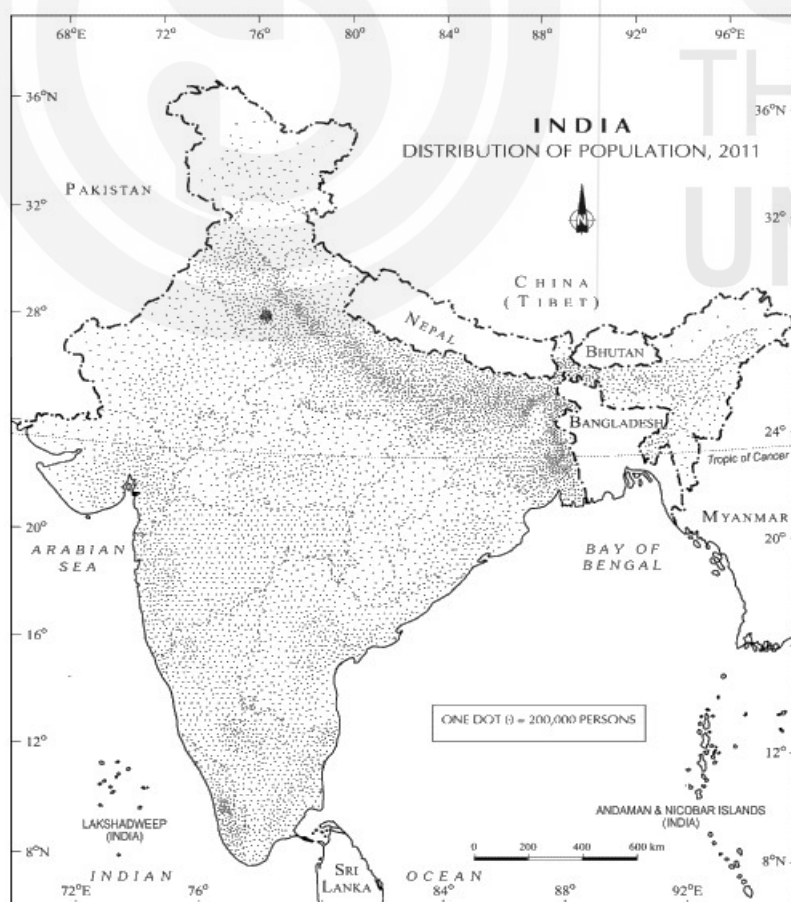


Fig. 2.3: Percentage Distribution of Population in India, 2011.

Apart from physiographic diversities, variations in micro-level terrain characteristics, climate, soil, resource availability, agricultural development, and industrial and associated urban development contribute to micro to meso level variations in population density as reflected at state level in the country. Among the states, Bihar records the highest population density ($1,102/\text{km}^2$), followed by West Bengal ($1,029/\text{km}^2$), Kerala ($860/\text{km}^2$) and Uttar Pradesh ($828/\text{km}^2$). On the other hand, While the states of Mizoram, Sikkim, Nagaland, Manipur, Himachal Pradesh, Jammu and Kashmir, Meghalaya and Uttarakhand in the hilly and mountainous region witness population density of below $200/\text{km}^2$, the states of Madhya Pradesh, Odisha, Andhra Pradesh, Karnataka and Maharashtra located in the Peninsular plateau region record a moderate population density of below $400/\text{km}^2$ (Table 2.6 and Fig. 2.4).



Fig. 2.4: Pattern of Population Density in India, 2011.

SAQ 6

What Which one of the following is the correct sequence of rising population density as per 2011 Census?

- (a) Uttar Pradesh-Kerala-Bihar-West Bengal
- (b) West Bengal-Kerala-Uttar Pradesh-Bihar
- (c) Kerala-Uttar Pradesh-West Bengal-Bihar
- (d) Uttar Pradesh-Kerala-West Bengal-Bihar

2.7 RURAL-URBAN DISTRIBUTION OF POPULATION: GLOBAL AND INDIAN SCENARIO

The prevalence of marked unevenness in the population distribution in the world can be seen with respect to its rural and urban distribution. As rural population is characterised largely by primary economic activities including agriculture and vast agricultural land, the rural areas are generally sparsely populated as compared to the urban areas, which are largely characterised by non-primary economic activities including industries with limited land. In view of marked contrast in spatial concentration of rural and urban population in different parts of the world, there exists considerable variation in the proportion of rural and urban population across the world. This is, however, more obvious between more developed and less developed countries, and also within each country.

As per the estimate for 2020, of the total population of the world (7.79 billion), the majority is living in the urban areas (56 per cent) and the minority in the rural areas (44 per cent). When distribution of urban population out of world's total population is considered at continent level, it does not vary much from the corresponding proportion of total population. Among the continents, the proportion of urban population is found to be the highest in Asia (53.9 per cent), followed by Africa (13.4 per cent), Europe (12.8 per cent), South America (9.9 per cent), North America (9.5 per cent) and Oceania (0.7 per cent) as against corresponding proportions of total population of 59.5 per cent, 17.2 per cent, 9.6 per cent, 8.4 per cent, 4.7 per cent and 0.5 per cent. Again, when distribution of urban population is looked at between more developed and less developed countries of the world, it is 23 per cent in the former and 77 per cent in the later. On the other hand, among the top ten countries of the world, the proportion of urban population to the world's total is found to be the highest in China (18.5 per cent), followed by India (17.7 per cent), the USA (4.2 per cent) and the lowest in Mexico (1.7 per cent) (Table 2.7).

Table 2.7: World's Share of Urban Population and Urbanization Level in Top 10 Countries of the World, 2020

Country	World's Share of Urban Population (%)	Urbanization Level (in %)
1. China	18.5	60.8
2. India	17.7	35.0
3. USA	4.2	82.8
4. Indonesia	3.5	56.4
5. Pakistan	2.8	35.1
6. Brazil	2.7	87.6
7. Nigeria	2.6	52.0
8. Bangladesh	2.1	39.4
9. Russia	1.9	73.7
10. Mexico	1.7	83.8
World	100.0	56.2

(Source: <https://worldometers.info>, Worldometer of Population (downloaded on 24th April, 2022))

Table 2.8: Proportion of Urban Population and Urbanization Level at State Level in India, 2011.

State/Union Territory	Percentage Share of Urban Population	Urbanization Level (in %)
1. Uttar Pradesh	11.81	22.28
2. Maharashtra	13.48	45.23
3. Bihar	3.12	11.30
4. West Bengal	7.72	31.89
5. Madhya Pradesh	5.32	27.63
6. Tamil Nadu	9.27	48.45
7. Rajasthan	4.52	24.89
8. Karnataka	6.26	38.57
9. Gujarat	6.84	42.58
10. Andhra Pradesh & Telangana	7.48	33.36
11. Odisha	1.86	16.68
12. Kerala	4.22	47.72
13. Jharkhand	2.10	24.05
14. Assam	1.16	14.08
15. Punjab	2.76	37.49
16. Chhattisgarh	1.57	23.24
17. Haryana	2.34	34.79
18. Delhi*	4.34	97.50
19. Jammu & Kashmir	0.91	27.21
20. Uttarakhand	0.81	30.55
21. Himachal Pradesh	0.18	10.04
22. Tripura	0.25	26.18
23. Meghalaya	0.16	20.08
24. Manipur	0.22	30.21
25. Nagaland	0.15	28.97
26. Goa	0.24	62.17
27. Arunachal Pradesh	0.08	22.67
28. Puducherry*	0.23	68.31
29. Mizoram	0.15	51.51
30. Chandigarh*	0.27	97.25
31. Sikkim	0.04	24.97
32. Andaman & Nicobar Islands*	0.04	35.67
33. Dadra & Nagar Haveli*	0.04	46.62
34. Daman & Diu*	0.05	75.16
35. Lakshadweep*	0.01	78.08
India	100.00	31.16

*Union Territories

(Source: Calculated based on Primary Census Abstract, India, Census of India, 2011)

So far distribution of urban population at state level across India as per 2011 Census is concerned, Maharashtra constitutes the highest proportion (13.48 per cent), followed by Uttar Pradesh (11.81 per cent). This share of urban population to the country's total is associated with overall population size of the state and the size of urban population.

SAQ 7

- a) Which one of the following countries records highest level of urbanization?
- (a) Russia
 - (b) USA
 - (c) Brazil
 - (d) China
- b) Which one among the following states records the lowest level of urbanization as per 2011 Census?
- (a) Punjab
 - (b) Uttar Pradesh
 - (c) Mizoram
 - (d) Madhya Pradesh
-

2.8 URBANIZATION: MEANING, PROCESSES AND FACTORS

The process of transformation of functional character of a place from largely agricultural into non-agricultural one through development of industries, trade and commerce, transport and communication, and various other infrastructure and services resulting in clustering of settlements and large scale migration from all around is broadly known as urbanization. But, in simple terms, the process of conversion of a village into a town along with fast change in its functional character and landscape may also be termed as urbanization. It is, however, not easy to define urbanization and for that matter identify a town explicitly. Generally, a place with clustering of settlements having mostly non-agricultural functions, a well-defined boundary and a local govt. is termed as a town. The people living in a town or urban centre are called urban population. Again, faster the process of urbanization, more will be the growth of urban population due to migration and lesser will be the rural population. As per the Census of India, any place with a minimum population of 5,000, population density of 400 persons/km² and 75 per cent male working population engaged in non-agricultural activities is identified as a town. On the other hand, any place with a notified municipal committee or municipal board is called a statutory town.

SAQ 8

What is mean by population concentration ratio? What could be its unit and range of values?

On the basis of population size, the towns or urban centres of India are categorised into Class I (City) with population 1 lakh and above; Class II with population 50,000-99,999; Class III with population 20,000-49,999; Class IV with population 10,000-19,999; Class V with population 5,000-9,999; and Class VI with population below 5,000. On the other hand, functionally towns may be industrial, trade and commerce, administrative, religious, residential,

tourist, etc. There are various measures of assessing urbanization. Some of the commonly used measures in this respect include percentage share of urban population; proportion of urban population to total population (urbanization level); pattern of urban concentration through location quotient and Gini's Concentration ratio, growth rate of urban population, urban primacy index and rank-size relationship of urban centres. The components of urban population growth include (i) natural growth due to fertility and mortality, (ii) expansion of urban area, (iii) reclassification or emergence of new urban centres, and (iv) balance of population migration, i.e. Immigration-Outmigration.

The process of urbanization at any place is basically the result of clustering of population due to the growth of diverse non-agricultural functions supported by various means of transport connectivity. The factors influencing urbanization can broadly be categorised into economic, social and demographic. Among the economic determinants, type of economy and its diversification, degree of commercialization of agriculture, degree of industrialization and degree of development of diverse means of transport and communication are important. The social factors influencing urbanization include modernization of living, social awakening, stage of technological advancement, the public policies and the govt. decisions. Among the demographic determinants, the rate of population growth, volume of migration and pressure of population are very important (Chandna, 2014).

The varied impact of such factors has resulted in very high level of urbanization (above 80 per cent) in the industrially advanced more developed countries and considerably low level of urbanization (below 50 per cent) in the predominantly agriculture-based less developed countries.

SAQ 9

What are the components of population growth of a town?

2.9 TREND OF URBANIZATION: GLOBAL AND INDIAN PERSPECTIVES

Ever since the formation of urban centre, the growth rate of urban population has always been faster than that of rural population. As a consequence, with the increase in the share of urban population as compared to rural counterpart the world's population is fast becoming urbanised. This phenomenon has become more so during the last few decades. So far the trend of urbanization level during the last six decades (1960-2020) in the world is concerned, it increased from 34 per cent to 56.2 per cent by experiencing an average annual growth rate of 2.45 per cent. On the other hand, India witnessed an increase in the urbanization level from 17.9 per cent to 35.0 per cent during the same period (Table 2.9) with annual growth rate of 3.03 per cent. Such a high level of urbanization in the world has been due to the prevalence of very high proportion of urban population in the industrialised developed countries and fast growing urban population in the developing countries like China, Brazil, etc in recent times. However, in view of reaching

a kind of saturation in urbanization in the developed countries with somewhat marginal rural-urban migration in recent times, the annual growth rate of urban population has declined from 2.84 per cent during 1960-1970 to 1.99 per cent during 2010-2020 (Table 2.9). But, due to the prevalence of much lower urbanization level, India has still been experiencing considerably higher annual growth rate of urban population during the same period, and as per the estimate it would cross 50 per cent urbanization level in 2050, when the global level of urbanization is likely to reach 69 per cent (Table 2.9).

Table 2.9: Trend of Urban population Growth and Urbanization Level in the World and India, 1960-2050.

Year	World			India		
	Urban Population	Percentage of Urban Population	Annual Growth Rate of Urban Population (in %)	Urban Population	Percentage of Urban Population	Annual Growth Rate of Urban Population (in %)
1960	1,023,845,517	34.0	-	80,565,723	17.9	-
1970	1,354,215,496	36.6	2.84	109,388,950	19.7	3.11
1980	1,754,201,029	39.3	2.62	160,941,941	23.0	3.94
1990	2,290,228,096	43.0	2.70	222,296,728	25.5	3.28
2000	2,868,307,513	46.7	2.28	291,350,282	27.6	2.74
2010	3,594,868,146	51.7	2.28	380,744,554	30.8	2.71
2020	4,378,993,944	56.2	1.99	483,098,640	35.0	2.41
2030	5,167,257,546	60.4	1.67	607,341,981	40.4	2.32
2040	5,938,249,026	64.6	1.40	744,380,367	46.7	2.05
2050	6,679,756,162	68.6	1.18	876,613,025	53.5	1.65

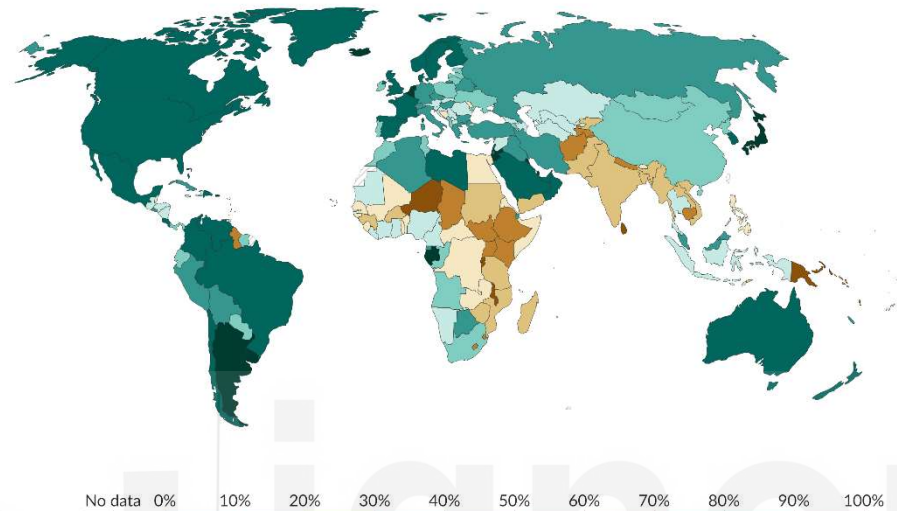
(Source: <https://worldometers.info>, Worldometer of Population (downloaded on 24th April, 2022))

2.10 GLOBAL PATTERNS OF URBANIZATION LEVEL

As already mentioned, the level of urbanization which reached 56 per cent in the world, as per the estimate of 2020, is quite unevenly distributed in its different parts (Fig. 2.5). In fact, it is above the world average in the industrially advanced continents of North America (83 per cent), Latin America and Caribbean (82 per cent) and Europe (75 per cent), and below the average in the continents with predominantly agrarian economies with varying degree of industrialization, such as Oceania (68 per cent), Asia (51 per cent) and Africa (44 per cent). On the other hand, among the top 10 populous countries of the world, Brazil records the highest urbanization level (87.6 per cent), followed by Mexico (83.8 per cent) and USA (82.8 per cent), and India witnesses the lowest (35 per cent), followed by Pakistan (35.1 per cent) and Bangladesh (39.4 per cent) (Table 2.7). It is further observed that the level of urbanization is either 100 per cent or very close to it in mostly the small countries like Monaco, Kuwait, Qatar, Nauru, Cayman Islands, Bermuda, Hongkong (SAR, China), Macau (SAR, China), Singapore, Sint Maarten, Reunion, Gibraltar, etc. Among the top ten metropolitan cities of the world (as per 2022 estimate of worldpopulationreview.com), Tokyo (37,435,191) occupies the first position, and it is followed by Delhi (29,399,141), Shanghai (26,317,104), Sao Paulo (21,846,507), Mexico City (21,671,908), Cairo

(20,484,965), Dhaka (20,283,552), Mumbai (20,185,064), Beijing (20,035,455) and Osaka (19,222,665). It is thus observed that out of these ten cities constituting 5.41 per cent of the world's total urban population, as many as seven are located in Asia alone.

Share of people living in urban areas, 2020



Data source: UN Population Division (via World Bank)

OurWorldinData.org/urbanization | CC BY

Note: Urban populations are defined based on the definition of urban areas by national statistical offices.

Fig. 2.5: Pattern of Urbanization in the World, 2020.

2.11 SPATIAL PATTERNS OF URBANIZATION LEVEL IN INDIA

Although the level of urbanization in India is still very low (35 per cent) as compared to the world average (56 per cent), it occupies a significant position in the urban scenario of the world due to its large number of metropolitan cities including the second largest Delhi and eighth largest Mumbai. But, in view of the prevalence of highly diverse physiographic character including large expanse of mountainous area and predominant agricultural economy in large parts of the country, the level of urbanization at state level as per 2011 Census varying from 10.04 per cent (Himachal Pradesh) to 62.17 per cent (Goa) is below national average (31.14 per cent) in 17 states and above national average in 11 states (Table 2.8 and Fig. 2.6). On the other hand, the level of urbanization has been much above the national average in all the then seven union territories of the country (Table 2.8). When looked at the overall regional pattern in this respect, it is quite high in the western (42.58 per cent to 62.17 per cent) and southern (33.36 per cent to 48.45 per cent) parts of the country as compared to the eastern (11.30 per cent to 51.51 per cent) and the northern (10.04 per cent to 37.49 per cent) parts.

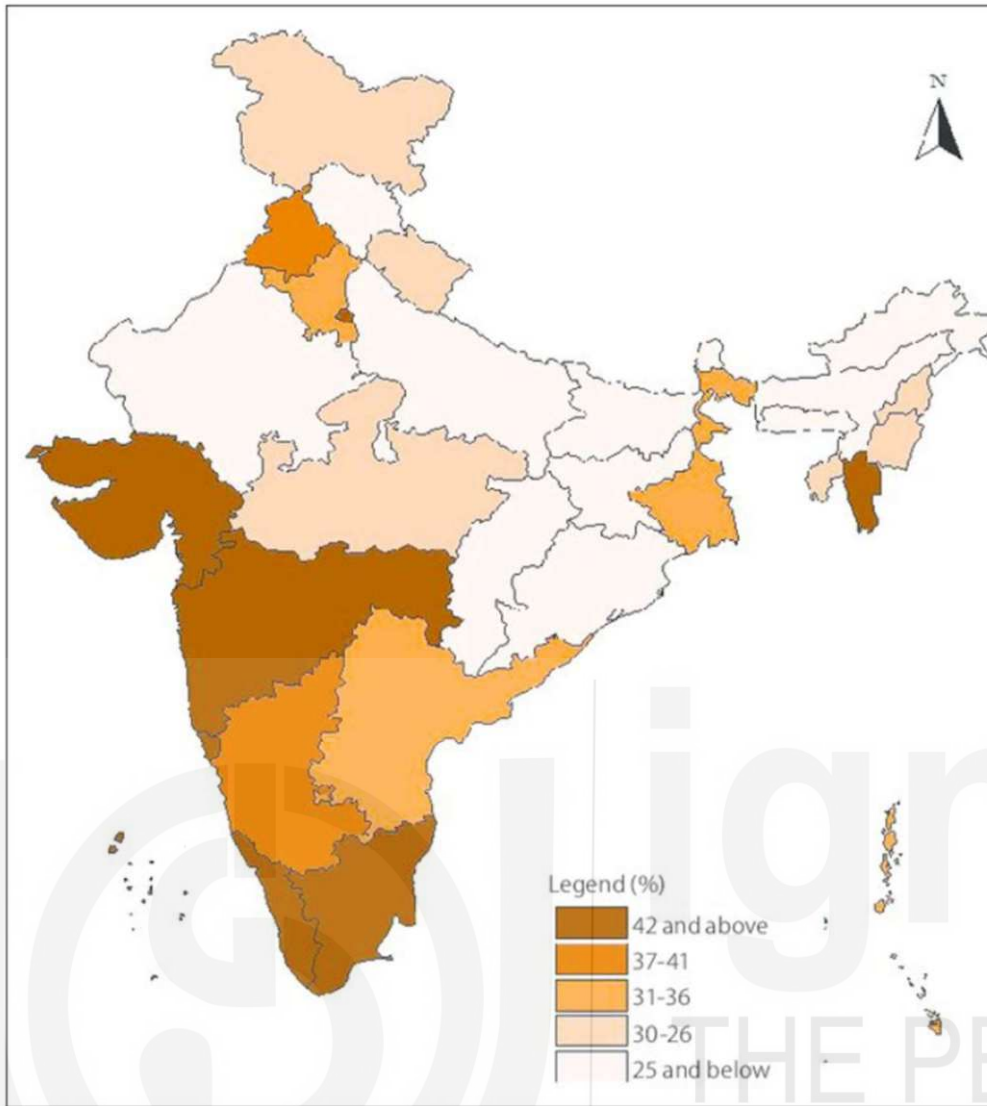


Fig. 2.6: Pattern of Urbanization in India, 2011.

2.12 SUMMARY

In this unit you have studied:

- The world's population which has reached 7.9 billion in 2022 is very unevenly distributed in different parts of the world due to highly diverse terrain character, climate, soil condition, agricultural practices and inequality in industrialization. The prevalence of a variety of favourable environmental and economic conditions combined with some degree of unfavourable socio-demographic characteristics has contributed to high concentration of population at various spatial levels ranging from the northern hemisphere (90 per cent), the continent of Asia (60 per cent), 20°N-40°N latitude zone (above 50 per cent) and the country of China (18.5 per cent). Among the major clusters of population in the world, south Asian region, east Asian region, west European region and north-east and mid-Atlantic coastal region of USA constituting more than two-third of the world's total population are important.
- The phenomenon of uneven distribution of population is reflected in the population density (persons/km²), which is found to vary from 104 in Asia

to 5 in Oceania as against world's 52. At country level within Asia, it varies between 8,358 and 2 respectively in Singapore and Mongolia.

- India, being characterised by marked physical diversities and socio-economic inequalities, presents a highly uneven population density, which varies between 780/km² in the Indo-Gangetic-Brahmaputra plain and 90/km² in the Himalayan mountainous region. Among the states, the population density varies between 1102 in Bihar and 17 in Arunachal Pradesh.
- The spatial pattern of urbanization, which is associated with process of population clustering along with transformation of economy from agricultural to non-agricultural one, is quite uneven across the world. In view of high degree of industrialization in the developed countries as compared to that of the less developed ones, the level of urbanization has become quite high (above 80 per cent) in most of the developed countries. However, the proportion of urban population has also started growing somewhat faster in the less developed countries in recent times, and as a consequence the level of urbanization in the World and India is likely to reach 68.6 per cent and 53.5 per cent respectively by 2050.
- Among the countries, the level of urbanization is so uneven that it is around 100 per cent in some of the small countries like Monaco, Kuwait, Qatar, Hongkong (SAR, China), Macau (SAR, China), Singapore, etc and almost 0 per cent in some small countries or territories like Saint Martin, Wallis and Futuna, Saint Barthelemy and Tokelau. In India also, regionally the level of urbanization is high in the western and southern regions, and low in the northern and eastern regions, and at state level it varies between as high as 62.17 per cent in Goa and as low as 10.04 per cent in Himachal Pradesh.

2.13 TERMINAL QUESTIONS

1. Present a picture of population distribution in the world. Highlight your answer with supporting data.
2. Discuss the factors influencing uneven distribution of population in the world. Mention the causes of emergence of the major population clusters in Asia, Europe and North America.
3. Examine different measures of population distribution, population density and urbanization with necessary illustrations.
4. Discuss the spatial pattern of population density in India and mention the factors behind marked unevenness in this respect.
5. Discuss the factors determining variation in urbanization in different parts of the world. Highlight the patterns of urbanization level in the world both at continent and country levels.
6. Present a regional picture of urbanization level in India with necessary data from the Census of India. What are the main causes of prevailing low urbanization in northern India?

2.14 ANSWERS

Self-Assessment Questions (SAQ)

1. The major clusters of population in the world include (i) South Asian region, (ii) East Asian region, (iii) West European region and (iv) North-eastern and Mid Atlantic region of USA. Among these, the first one, i.e. South Asian region constitutes the largest share of world population.
2. Most of the river valleys of the world like Indus, Nile, Ganges, Brahmaputra, Yangtze, etc are densely populated due to availability of levelled land, fertile alluvial soil and water, and water transport accessibility. This is also why the ancient civilizations flourished in the river valleys.
3. a) Number of persons per unit area is known as population density. It is basically man-land ratio. For instance, population density of India as per 2011 Census data is 382 persons per km². Between arithmetic density and physiological density of population, the former refers to number of persons per unit of total area and the later refers to number of persons per unit of area under agriculture.
b) Population concentration ratio is defined as the ratio between proportion of population and corresponding proportion of area. It can also be found out by dividing population density of an individual spatial unit by the population density of the entire area. The value of population concentration ratio does not have any unit, i.e. it is unit-less. It ranges from 0 to more than 1 through 1.
5. (b) Bangladesh-India-Nigeria-China
6. (d) Uttar Pradesh-Kerala-West Bengal-Bihar
7. (c) Brazil
8. (b) Uttar Pradesh
9. The process of clustering of population involving transformation of economy from agricultural to non-agricultural one is called urbanization. The proportion of urban population to total population of an area is called urbanization level. It is expressed in percentage.
10. The components of population growth of a town include (i) natural growth due to fertility and mortality, (ii) expansion of town area and (iii) migration.

Terminal Questions

1. Based on discussion under 2.2 with reference to Table 2.1.
2. Based on discussion under 2.3 with reference to 2.2 regarding major population clusters of the world.
3. Based on discussion under 2.4.
4. Based on discussion under 2.6 with reference to Table 2.6.
5. Based on discussion under 2.7, 2.8, 2.9 and 2.10 with reference to Table 2.7 and 2.9.

6. Based on discussion under 2.10 with reference to Table 2.8.

2.15 REFERENCES AND FURTHER READING

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UNIT 3

DEMOGRAPHIC AND ECONOMIC COMPOSITION

Structure

3.1	Introduction	Concept and Determinants
	Expected Learning Outcomes	Analysis
3.2	Age Composition	World Pattern of Work
	Concepts and Determinants	Participation Rate and
	Analysis	Occupational Composition
	Global Pattern	Spatial Pattern of Work
	Spatial Pattern in India	Participation Rate and
3.3	Sex Composition	Occupational Composition in
	Concept, Measures and	India
	Determinants	3.6 Summary
	Global Pattern	3.7 Terminal Questions
	Spatial Pattern in India	3.8 Answers
3.4	Age-Sex Pyramid for India	3.9 References and Further
	and Selected Countries	Reading
3.5	Economic Composition	

3.1 INTRODUCTION

In Unit 2 we discussed about distribution of population in the world with special reference to India basically dealing with population density and level of urbanization. Now, with a view to understand the quality of human population, in this unit (Unit 3) the demographic attributes like age and sex composition and economic attributes like work participation and occupational composition are taken into consideration. It may be mentioned here that demographic characteristics in terms of age structure and sex ratio, and economic characteristics in terms of work participation rate and occupation structure of the workers in the world and its different parts including India, which vary spatially at different level, reflect the prevailing socio-economic condition of population in the areas concerned.

Expected Learning Outcomes

After studying this unit you should be able to:

- Describe age composition of population and its changing trend in the world and India, and factors associated with its variation;
- Explain the concept of age dependency ratio and ageing index, and their spatial patterns in the world and India;
- Discuss changing trend and spatial pattern of sex ratio in the world and India;
- Describe the concept of work participation and economic dependency, and spatial variation in work participation rate in the world and India; and
- Explain occupational composition and spatial patterns of its degree of diversity in the world and India.

3.2 AGE COMPOSITION

In this section we will discuss one of the important demographic composition namely age composition. Under age composition, attempt has been made to describe the related concepts, determinants and analyse age related data. This section will also highlight spatial pattern both at global and India level.

3.2.1 Concepts and Determinants

The age composition (also called age structure) of population, which basically refers to distribution of population with respect to age, is considered as one of the basic demographic characteristics of population. Its study is important in a number of ways. Being basically determined by fertility, mortality and migration, the age structure of any population influences the growth of population, employment or work participation pattern, age at marriage and education in any area. Clarke (1972) points out that these three determinants of age structure are inter-dependent, and any change in one of these may influence the other two, and it is through these variables that influence the age structure.

It is the fertility rate which determines the proportion of population in different age categories. In fact, the areas with high fertility rates constitute a large proportion of economically dependent population in the young age group, i.e. 0-14. Such a situation may have a far reaching impact on the population structure including high natural growth of population, high dependency ratio, increase of unemployment, lower age at marriage and lack of proper education. The impact of all these is likely to be even more upon the physical and socio-economic quality of women population, and it may be more so in the less developed countries of the world.

It may be mentioned here that many of the countries of Africa, Asia and Latin America, which are characterised by high birth rates witness large proportions of population in young age group. As the life expectancy in such countries is very short, the proportion of population in old age groups is also not very large. In fact, in most of such countries, as high as two-fifth of their population is under 15 years of age. But the proportion of population in the older age groups in these countries is relatively large, and as such most of the countries of Europe and North America, which have already completed their demographic transition, record an age composition with low proportion of young population and relatively high proportion of old age population. Such a

downward trend in fertility rate and consequent upward trend in proportion of older age population can be seen in the developed countries like USA, Germany, UK, Russia, Australia, Japan, New Zealand, etc.

The age structure of population of an area is also influenced by mortality rate and more particularly due to variations in mortality rate at different ages. As observed among the developed countries, if the mortality rate is low both among younger and older age-groups, it may result in an increase in the proportion of population in higher age-groups. On the other hand, when decline in mortality as observed in the less developed countries is quite sharp in lower age-groups, there would be marked rise in younger age population. Although there is marked influence of migration upon age composition of population, it is very difficult to find out its specific impact as compared to fertility and mortality rates. It may, however, be mentioned here that the age composition of population in both source and destination areas gets changed due to migration of population of a specific age-group. Hence, if migration of population of the age group 25-35 takes place for job from one area to another, the proportion of population in the age group 25-35 decreases in the area of out-migration, while it increases in the area of in-migration. This is how migration brings about change in age composition of population.

SAQ I

What do you mean by age structure of population? Mention the basic factors determining its variation.

3.2.2 Analysis of Age related Data

The age data of population can be analysed and presented in a number of ways in population geography for their proper understanding and related implications. Generally, it is done through age grouping, age indices and age pyramids.

Age Grouping: Although age data of population is collected on the basis of singular age of every individual, generally such data are presented in the form of 5-yearly age groups like 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80+. The singular age of a person is recorded in terms of completed year, i.e. an infant below the age of 1 year is recorded 0 year, and a child who completes first year of birth is recorded 1 year. Accordingly, the age group 0-4 means population with age below 5 years, and 80+ means population with age 80 and above. Such a grouping of age data of population helps us in carrying out regional and temporal comparisons. For further simplification of age data analysis, such data are broadly grouped into three age groups, viz. 0-14 (Children or Young age), 15-59 (Adult or Active age) and 60+ or 60 and above (Aged or old age). The proportion of population in age group 0-14, i.e. children below the age of 15, indicates the prevailing fertility level and stage of demographic transition. It means, if the proportion of population in this age group in a country stands at above 35 per cent, it must be experiencing high fertility rate and demographically it is in the second or third stage of transition. This is generally a case of less developed country. On the other hand, if the

proportion of population in another country is below 20 per cent, it must be witnessing low fertility rate and demographically it is in the final stage of transition. This type of situation is generally found in the developed country. The age group 15-59 is considered to be biologically most reproductive, economically most productive and demographically most mobile (Trewartha, 1969). In fact, the population of this age group supports the burden of the other two age groups with respect to food, clothing, educating children and looking after the old people. In view of this, the population of adult age group is also known as economically independent. Although the proportion of adult population does not vary much across the world, it is slightly higher in the developed countries as compared to that of less developed countries due to prevalence of considerably lower fertility rate in the former. In view of marked rise in the life expectancy in most parts of the world, this adult or active age group is considered to be 15-64 more particularly in the developed world. The age group 60+ or sometimes 65+ constitutes the aged or old people, or senior citizens who are considered to be economically non-productive, biologically non-reproductive and demographically least mobile. It is therefore economically dependent age group. It may be mentioned here that the proportion of population in this age group is higher in the more developed countries due to the prevalence of lower fertility rate and higher life expectancy as compared to that of less developed countries. On the other hand, the proportion of female population in this age group is considerably higher than that of male population due to the prevalence of higher mortality rate among the aged males.

Age Indices: The age composition of population can be analysed with the help of different age indices. The calculation of such age indices can help us understand the demographic implications of varying age composition and find out regional differences in the patterns of age composition in the world. Among different age indices, Dependency Ratio and Ageing Index are very popular and informative. The ratio between young (0-14) plus aged (60+ or 65+) population and adult population (15-59 or 15-64) is known as dependency ratio. It is generally expressed in percentage. The value of dependency ratio is high in the case of less developed countries with high fertility rate. On the other hand, the ratio between aged population (60+ or 65+) and young population (0-14) is called ageing index. It is also generally expressed in percentage. The value of ageing index is high in the case of developed countries with low fertility and high life expectancy.

SAQ 2

- a) What are the broad age groups of population? Mention their demographic significance.
 - b) Distinguish between dependency ratio and ageing index.
-

Age Pyramid: The graphical representation of age data of population on 5-yearly age-groups in the form of series of horizontally arranged bars according to proportion of population is known as Age Pyramid. It is commonly called Age-Sex Pyramid, because proportion of population or absolute number under different 5-yearly age groups is shown both for male

and female separately in same framework. The age-groups are put in the vertical axis serially like 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79 and 80+ with horizontal bar for each age-group by placing it on the left for female and right for male. As under normal circumstances the number of male or female or the respective proportions in each successive age-group gradually decreases from the base upward, it takes the shape of a pyramid.

Depending on varying age composition of population owing to prevalence of differential fertility and mortality patterns and consequent varying life expectancy at birth, there are broadly three types of population pyramids: Expansive, Constrictive and Stationary (Fig. 3.1)



Fig. 3.1: Age-Sex Pyramids for Expansive Population, Constrictive Population and Stationary Population.

1. **Expansive population pyramid:** It depicts population which has a larger proportion of people in younger age groups. The populations with this type of pyramid usually have high fertility rates with lower life expectancies. Many less developed countries including India, Bangladesh, Angola, etc exhibit expansive population pyramids indicating youthful population.
2. **Constrictive population pyramid:** It is named so because the pyramid is constricted at the bottom due to lower proportion of younger people. Constrictive population pyramids show declining birth rates, since each succeeding age group is getting smaller and smaller. The United States has a constrictive population pyramid with ageing population.
3. **Stationary population pyramid:** It somewhat shows an equal proportion of the population in each age group with almost stable population. There is even not a decrease or increase in population. Austria has a stationary population pyramid with largely aged population.

Median Age: The median value of age data of population of any country or area is known as median age. Depending on fertility rate and life expectancy the median age varies from one country to another, i.e. higher value for

developed countries like Germany, USA, Japan, etc with lower fertility and ageing; and lower value for less developed countries like India, Kenya, Bangladesh, etc with higher fertility and lower life expectancy. Hence, the value of median age can be considered an important indicator of age composition.

SAQ 3

- a) Which one of the following countries would have expansive population pyramid?
(A) South Korea (B) Singapore (C) Egypt (D) USA
- b) Which one of the following countries is different from the other three with respect to ageing index of population?
(A) Japan (B) Nigeria (C) Myanmar (D) Pakistan

3.2.3 Global Pattern

If analysis of age composition of population is done for broad age groups like 0-14, 15-64 and 65 and above, globally the proportions of population are found to be 26 per cent in the age group 0-14, 64 per cent in 15-64 and 10 per cent in 65 and above as per 2021 estimate of the Statista Research Department, USA. Among the continents, the proportion of population in children age group (0-14) is found to be the highest in Africa (40 per cent) and lowest in Europe (16 per cent) (Table 3.1). The ageing in Europe has reached such an extent that the proportion of population in age group 65 and above (19 per cent) has become more than that of 0-14 age group. Although there has been considerable decline in the proportion of population in age group 0-14 during 1975-2021 in the world (36.9 per cent to 26.0 per cent), it has been quite slow in Africa (44.7 per cent to 40.0 per cent) and quite fast in Asia (from 39.9 per cent to 24.0 per cent) (Table 3.1).

Table 3.1: Age Composition of Population at Continent Level in the World, 1975-2021

Continent	Percentage of Population in Broad Age Groups in 1975, 1995 and 2021								
	1975			1995			2021		
	0-14	15-64	65 and above	0-14	15-64	65 and above	0-14	15-64	65 and above
1. Africa	44.7	52.2	3.1	44.0	52.8	3.2	40.0	56.0	4.0
2. Asia	39.9	55.9	4.2	32.0	62.7	5.3	24.0	67.0	9.0
3. Europe	23.7	64.9	11.4	19.2	67.0	13.8	16.0	65.0	19.0
4. North America	31.2	60.5	8.3	27.0	63.2	9.8	18.0	65.0	17.0
5. South America	39.5	56.2	4.3	32.7	61.8	5.5	24.0	67.0	9.0
6. Oceania	31.1	61.4	7.5	26.0	64.5	9.5	23.0	64.0	13.0
World	36.9	57.5	5.6	31.5	62.0	6.5	26.0	64.0	10.0

(Source: UNDP, World Resources, 1996-97, Oxford University Press; and <https://www.statista.com/statistics/265759/world-population-by-age-and-region>, 2021 (Downloaded on 28th August, 2022))

Table 3.2: Age Composition of Population in Selected Countries of the World, 2020

Country	Percentage of Population in Broad Age Groups			Dependency Ratio (%)	Ageing Index (%)
	0-14	15-64	65 and above		
Asia					
Yemen Republic	39.2	58.0	2.8	72.4	7.1
India	26.3	67.0	6.7	49.3	25.5
China	17.3	70.4	12.3	42.0	71.1
Japan	12.5	58.3	29.2	71.5	233.6
Africa					
Kenya	38.7	58.2	3.1	71.8	8.0
Egypt	33.6	61.9	4.5	61.6	13.4
South Africa	27.9	66.0	6.1	51.5	21.9
Niger	50.6	46.7	2.7	114.1	5.3
Europe					
UK	17.6	63.9	18.5	56.5	105.1
Germany	12.9	64.1	23.0	56.0	178.3
Sweden	17.7	61.7	20.6	62.1	116.4
Russia	17.2	67.3	15.5	48.6	90.11
North America					
USA	18.5	64.7	16.8	54.6	90.8
Canada	16.0	65.0	19.0	53.8	118.8
Mexico	26.0	66.3	7.7	50.8	29.6
Nicaragua	25.6	68.6	5.8	45.8	22.6
South America					
Brazil	21.1	69.7	9.2	43.5	43.6
Colombia	23.3	68.3	8.4	46.4	36.1
Argentina	24.0	63.9	12.1	56.5	50.4
Paraguay	23.4	68.7	7.9	45.6	33.8
Oceania					
Australia	18.7	65.4	15.9	52.9	85.0
New Zealand	19.6	64.8	15.6	54.3	79.6
Fiji	26.9	65.8	7.3	52.0	27.1

(Source: https://en.wikipedia.org/wiki/List_of_countries_by_age_structure (Downloaded on 29th August, 2022))

When looked at country level, the age composition of population is found to vary significantly across each continent and also across the world. Among the continents, Asia witnesses the highest degree of variation in age composition, while Europe exhibits the lowest degree of variation (Table 3.2). In the case of proportion of population in 0-14 age group in Asia, it is found to vary from as high as 39.2 per cent in Yemen and as low 12.5 per cent in Japan. In view of very high proportion of population in 65 and above age group in Japan, the values of both dependency ratio (71.5%) and ageing index (233.6%) are found to be very high. On the other hand, Niger of Africa witnesses very high dependency ratio (114.1%) due to its very high proportion of population in 0-

14 age group, and very low ageing index value (5.3%) owing to its very low proportion of population in 65 and above age group (Table 3.2). It is thus observed that the developed countries where fertility rate is very low along with high life expectancy, the values of both dependency ratio and ageing index become very high.

SAQ 4

Among the following countries, which one experiences highest proportion of population in 0-14 age group?

(A) South Africa (B) Brazil (C) Mexico (D) Kenya

3.2.4 Spatial Pattern in India

In view of the prevalence of considerably high fertility in India, its proportion of population as per 2011 Census in age group 0-14 is still quite high (30.8 per cent). On the other hand, due to high fertility and low life expectancy the proportion of its population in 65 and above age group is found to be quite low (5.5 per cent) (Table 3.3). However, there exists marked spatial variation in age composition of population among the states and union territories of the country depending on spatial variation in fertility behaviour, mortality behaviour, life expectancy, age-selective migration and rural-urban migration. The variation in age composition is also visible between rural and urban areas of the country. This phenomenon is clearly observed in the case of proportion of population in age group 0-14, which is found to be 32.8 per cent in the rural areas as against 26.2 per cent in the urban areas. This has resulted in higher dependency ratio in the rural areas (62.3%) as compared to that in urban areas (45.6%).

Table 3.3: Age Composition of Population in the States/UTs of India, 2011.

State/UT	Percentage of Population in Broad Age Groups			Dependency Ratio (%)	Ageing Index (%)
	0-14	15-64	65 and Above		
1. Jammu & Kashmir	33.8	61.4	4.8	62.9	14.2
2. Himachal Pradesh	25.9	67.2	6.9	48.9	26.6
3. Punjab	25.5	67.7	6.8	47.7	26.2
4. Chandigarh	25.3	70.8	3.9	41.2	15.4
5. Uttarakhand	31.0	63.3	5.7	58.1	18.3
6. Haryana	29.7	65.0	5.3	53.9	17.8
7. NCT of Delhi	27.2	68.7	4.1	45.4	14.7
8. Rajasthan	34.6	60.5	4.9	65.8	14.1
9. Uttar Pradesh	35.7	59.4	4.9	69.3	13.7
10. Bihar	40.1	55.3	4.6	81.1	11.2
11. Sikkim	27.2	68.3	4.5	46.5	16.5
12. Arunachal Pradesh	35.7	61.5	2.8	62.6	7.8
13. Nagaland	34.3	62.4	3.3	60.3	9.6
14. Manipur	30.2	65.2	4.6	53.3	14.9
15. Mizoram	32.4	63.6	4.0	57.3	12.3

16. Tripura	27.7	67.0	5.3	49.1	18.7
17. Meghalaya	39.7	57.2	3.1	67.9	7.5
18. Assam	32.8	62.9	4.3	58.8	12.8
19. West Bengal	27.1	67.4	5.5	48.4	20.3
20. Jharkhand	36.1	59.6	4.3	67.7	11.7
21. Odisha	28.8	65.2	6.0	53.5	20.8
22. Chhattisgarh	32.0	63.1	4.9	58.6	15.3
23. Madhya Pradesh	33.5	61.4	5.1	62.9	15.2
24. Gujarat	28.9	65.9	5.2	51.8	17.6
25. Daman & Diu	22.6	74.4	3.0	34.3	12.8
26. Dadra & Nagar Haveli	31.4	66.3	2.3	51.0	7.3
27. Maharashtra	26.6	66.8	6.6	49.7	24.8
28. Andhra Pradesh	25.8	68.2	6.0	46.6	23.2
29. Karnataka	26.2	67.7	6.1	47.7	23.2
30. Goa	21.8	71.2	7.0	40.4	32.1
31. Lakshadweep	25.5	69.5	5.0	43.9	19.6
32. Kerala	23.4	68.3	8.3	46.4	35.4
33. Tamil Nadu	23.6	69.8	6.6	43.26	27.9
INDIA	30.8	63.7	5.5	57.0	17.9

(Source: Computed from Census of India, 2011, Table C-14, Population in 5-year Age Groups by Residence and Sex, India)

So far spatial variation in the proportion of children population in 0-14 age group in the country among the states is concerned, it is found to vary from as low as 21.8 per cent (Goa) to as high as 40.1 per cent (Bihar) (Table 3.3). Similarly, the consequent dependency ratio has also been the highest in Bihar (81.1 per cent) and lowest in Goa (40.4 per cent) as against country's average of 57.0 per cent. When this picture is looked at zonal level in the country, both proportion of population in 0-14 age group and dependency ratio are found to be very high in most of the northern states, followed by eastern and north-eastern states with high moderate values, western states with low moderate values and the lowest in the southern states (Table 3.3). It has been further observed that the areas where the proportion of children population is more primarily due to high fertility rate, the corresponding proportions of aged population in age group 65+ and adult population in age group 15-64 are found to be quite low (Table 3.3). This phenomenon also results in high dependency and very low ageing in the population of such areas.

SAQ 5

Among the following states of India, which one has proportion of population in 65 and above age group higher than the country's average?

(A) Jharkhand (B) Himachal Pradesh (C) Mizoram (D) West Bengal

3.3 SEX COMPOSITION

In this section we will discuss another important demographic composition namely sex composition. Like age composition, attempt has been made to

describe the concepts, measures and determinants related to sex composition. This section will also highlight spatial pattern both at global and India level.

3.3.1 Concept, Measures and Determinants

The proportion of males and females in human population is known as sex composition of population. The numerical measurement of sex composition of population of any area is generally expressed in terms of sex ratio. Although its basic concept is same, this ratio between number of males and females, or between females and males is calculated differently in different countries. For instance, in Russia the sex ratio is calculated as percentage of male or female population to total population. Hence, in the case of perfectly balanced sex ratio, the values will be 50 per cent male and 50 per cent female. In countries like USA and UK, the sex ratio is computed in terms of number of males per one hundred females. In New Zealand, it is calculated in terms of number of females per one hundred males. On the other hand, in India the sex ratio is computed in terms of number of females per thousand males. Accordingly, the Census of India calculates sex ratio of the country by dividing total female population by total male population and then multiplied by one thousand. Hence, the availability of male and female population data is necessary for calculation of sex ratio.

The sex composition of population, which is measured in terms of sex ratio between male and female population, can broadly be of three types: (1) Primary sex ratio, (ii) Secondary sex ratio; and (3) Tertiary sex ratio. While primary sex ratio refers to the ratio between female and male population at the time of conception, the secondary sex ratio is the ratio between female and male population at the time of birth, and the tertiary sex ratio denotes the ratio between female and male population at the time of enumeration. Unlike theoretically expected equality of female and male, the primary sex ratio varies significantly due to frequency of male and female abortions, miscarriages and still-births including live birth records. In the case of secondary sex ratio, also known as natural sex ratio, it is found to deviate from the equality. It is generally observed across the world that more male babies are born as compared to that of female babies. It is found to vary from 105 male babies to 100 female babies to as high as 107 male babies to 100 female babies. The evidences further reveal that more numbers of male babies die at the time of birth due to various pregnancy-related complications. The variation in secondary sex ratio may also be due to the prevalence of varying rates of mortality at different age groups. The tertiary sex ratio is determined by sex ratio at birth, sex ratio at death and the sex ratio of the migrants. However, the migration factor stands out to be more significant in determining tertiary sex ratio. As migration largely due to economic reason is mostly male selective, the areas experiencing in-migration witness excess of males in the population. This phenomenon is more prominent in the large urban areas and cities witnessing large-scale rural-urban migration.

3.3.2 World Pattern

The sex ratio, which is generally measured in terms of number of females to number of males, is found to vary from one country to another (Fig. 3.2). It

may be stated here that unless otherwise mentioned, merely by sex ratio we mean tertiary sex ratio, which is measured at the time of enumeration. Accordingly, although there is marginal shortage of females as against males in the world as a whole, it is found to be in excess in the developed countries of Europe and North America as against the less developed countries of Asia and South America. As per estimate for 2021, the world as a whole records 49.58 per cent of female population with a sex ratio of 983 females per thousand males. So far the trend of sex ratio (number of females per thousand males) in the world as a whole is concerned, it witnessed a marginal decline from 993 to 983 during 1980-2015, and it is estimated to reach 991 in 2050 and 997 in 2100 (Statisticstimes.com).

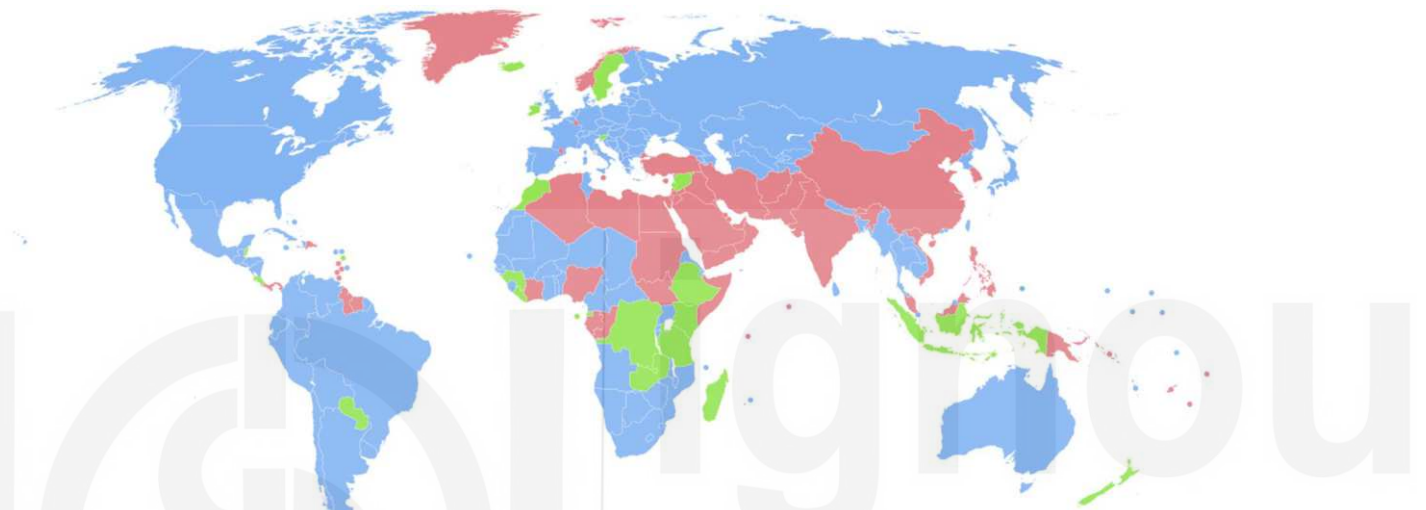


Fig. 3.2: Spatial pattern of sex ratio in the World, 2021.

(By Asus2004 - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=99656091>)

When the pattern of sex ratio (number of females per one thousand males) as per 2021 estimates is looked at country level in the world, it is found to vary from as low as 334 in Qatar to as high as 1,184 in Hong Kong, China (Statisticstimes.com). In fact, sex ratio has been quite low in many of the Muslim dominated Asiatic countries like Qatar, United Arab Emirates, Oman, Bahrain, Maldives, Kuwait and Saudi Arabia due to male-selective migration to these countries and also prevalence of somewhat low female status. The shortage of females as compared to males, i.e. sex ratio of below 1000, is visible in as many as 66 countries of the world (Table 3.5). It means that still 135 countries and territories witness sex ratio of above 1000.

Table 3.4: Pattern of distribution of Sex Ratio at country-level in the World, 2021

Sex Ratio (No. of females per thousand males)	No. of Countries/Territories
Below 900	09
900-925	04
925-950	05
950-975	13
975-1000	45
1000-1025	49
1025-1050	34

1050-1075	19
1075-1100	06
1100 and above	17

(Source: Computed by using data Downloaded on 11th September, 2022 from <https://statisticstimes.com/demographics/country-sex-ratio.php>.)

Among the top 10 populous countries of the world, the sex ratio is found to be the highest in Russia (1157), followed by Mexico (1041) and lowest in India (925), followed by Pakistan (943) as against the global average of 983 (Table 3.5). It thus indicates that the sex ratio is high in the countries of Europe, North America and South America, and low in the countries of Asia and Africa. The low sex ratio in most parts of Asia and Africa could be largely due to excess of birth of males and prevailing high incidence of female child mortality.

Table 3.5: Sex Ratio in Top 10 Populous Countries of the World, 2021.

Country	Sex Ratio (No. of females per thousand males)
1. China	950
2. India	925
3. USA	1021
4. Indonesia	986
5. Pakistan	943
6. Brazil	1037
7. Nigeria	973
8. Bangladesh	979
9. Russia	1157
10. Mexico	1041
World	983

(Source: Computed by using data Downloaded on 11th September, 2022 from <https://statisticstimes.com/demographics/country-sex-ratio.php>.)

SAQ 6

In which one of the following countries the sex ratio (number of females per thousand males) is above 1000?

(A) China (B) Nigeria (C) Brazil (D) Indonesia

3.3.3 Spatial Pattern in India

As already mentioned, India is characterised by marked paucity of females in the population. So far the trend of sex ratio (number of females per thousand males) as per Census of India in the country is concerned, although it was considerably high (972) in 1901, it continued to decline to 927 in 1991 and then with slight rise afterwards it reached 943 in 2011. Such a deficit in female population in the country has been mainly associated with excess of males in birth, and high incidence of female child mortality and maternal mortality due to the prevalence of low female status. However, there exists marked spatial variation in sex ratio in the country as influenced by male-selective migration, rural-urban differential and prevailing variations in socio-economic characteristics with respect to ethno-religious and caste-based diversities and locational specifics. In view of male-selective rural-urban migration more

particularly in the large urban areas of the country, the urban sex ratio in the country as per 2011 Census (929) remains lower than rural sex ratio (949).

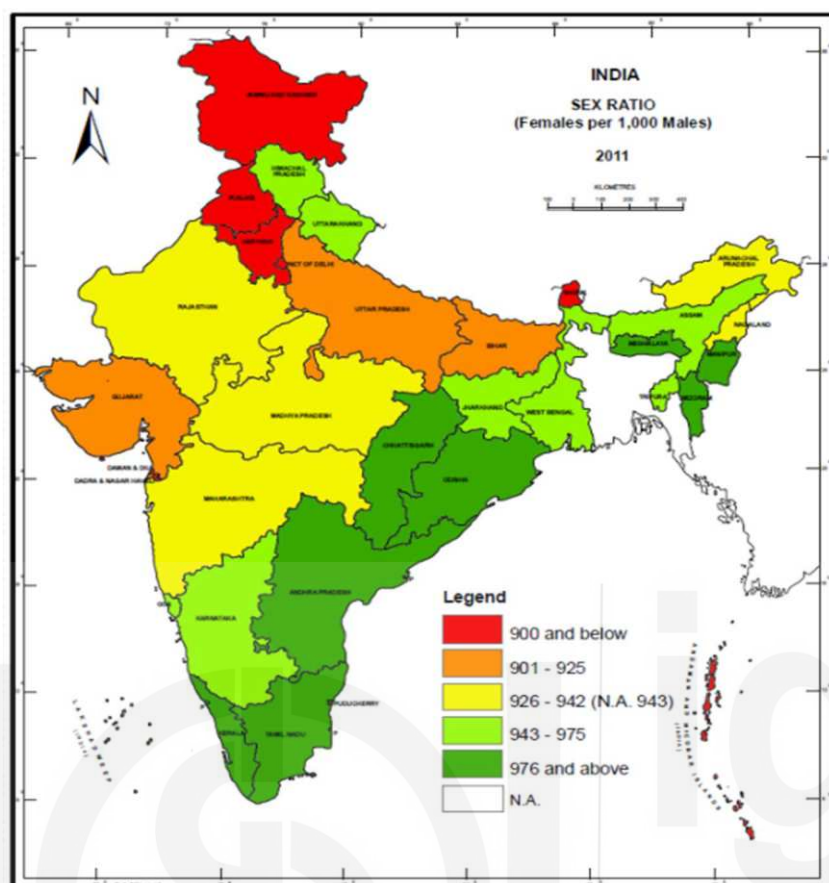


Fig. 3.3: Spatial pattern of sex ratio in India, 2011.

(Source: Census of India, 2011)

Table 3.6: Pattern of Sex Ratio at State Level in India, 2011.

Country/Union Territory	Sex Ratio (Number of females per thousand males)			Sex Ratio Among 0-6 Population
	Total	Rural	Urban	
1. Kerala	1084	1078	1091	964
2. Puducherry	1038	1028	1042	967
3. Tamil Nadu	995	993	1000	943
4. Andhra Pradesh	992	996	987	939
5. Chhattisgarh	991	1001	956	969
6. Manipur	987	976	1026	936
7. Meghalaya	986	986	1001	970
8. Odisha	978	989	932	941
9. Mizoram	975	952	998	970
10. Himachal Pradesh	974	986	853	909
11. Karnataka	968	979	963	948
12. Goa	968	1003	956	942
13. Uttarakhand	963	1000	884	890
14. Tripura	961	955	973	957
15. Assam	954	960	946	962
16. Jharkhand	947	961	910	948
17. West Bengal	947	953	944	956

18. Lakshadweep	846	952	945	911
19. Nagaland	931	940	908	943
20. Madhya Pradesh	930	936	918	918
21. Rajasthan	926	933	933	888
22. Maharashtra	925	952	903	894
23. Arunachal Pradesh	920	953	890	972
24. Gujarat	918	949	880	890
25. Bihar	916	921	895	935
26. Uttar Pradesh	908	918	894	902
27. Punjab	893	907	875	846
28. Sikkim	889	882	913	957
29. Jammu & Kashmir	883	908	840	862
30. Andaman & Nicobar Islands	876	877	874	968
31. Haryana	877	882	873	834
32. NCT of Delhi	866	852	868	871
33. Chandigarh	818	690	822	880
34. Dadra & Nagar Haveli	775	863	682	926
35. Daman & Diu	618	864	551	904
INDIA	943	949	929	919

(Source: Rural Urban Distribution of Population - India, Census of India 2011 (PCA of Final Data))

So far spatial variation in sex ratio in the country among the states and union territories as per 2011 Census is concerned, it is found to vary from as low as 618 in Daman & Diu, followed by 775 in Dadra & Nagar Haveli to as high as 1084 in Kerala, followed by 1038 in Puducherry (Table 3.6 and Fig. 3.3). It is quite discouraging that among altogether 35 states and union territories in the country, the sex ratio is in favour female only in Kerala and Puducherry. Among others, it is almost balanced in Tamil Nadu, Andhra Pradesh and Chhattisgarh. Although the sex ratio is generally higher in the rural areas, it is found to vary from as low as 690 in Chandigarh to as high as 1078 in Kerala. However, the sex ratio is balanced and above 1000 in seven states and union territories of the country. The picture with respect to sex ratio is more discouraging in the case of urban population, where it varies more significantly from as low as 551 in Daman & Diu to as high as 1091 in Kerala (Table 3.6). Interestingly, in the case of urban population also, the sex ratio is found to be in favour of females in Kerala, Puducherry, Manipur and Meghalaya, and almost balanced in Tamil Nadu and Mizoram. It means that the picture of sex ratio is somewhat better irrespective of rural and urban areas in the southern and north-eastern parts of the country. It is, however, quite discouraging that the sex ratio among 0-6 population in the country is as low as 919. Among the states and union territories also, it varies between 834 in Haryana and 972 in Arunachal Pradesh. Such a phenomenon may largely be attributed to excess of males in birth combined with high incidence of mortality of girl child and possibility of female selective abortion of foetus.

SAQ 7

In which one of the following Indian states the sex ratio (number of females per thousand males) is below the national average?

3.4 AGE-SEX PYRAMID FOR INDIA AND SELECTED COUNTRIES

Depending upon the stage of demographic transition and also due to the incidence of epidemics, wars, migrations, etc the shape of pyramid differs from one country to another. In this respect the countries characterised by high birth rate and high death rate the pyramids take the shape with broad base and narrowing down upward towards the higher age groups like that of a triangle. On the other hand, the countries experiencing third or fourth stage of demographic transition, display a narrower base with equally wide subsequent age-groups tapering off gradually upward. Thus, looking at the shape of a pyramid one can understand the stage of demographic transition and associated age structure.

The following age-sex pyramids display the prevailing fertility patterns and associated age-sex composition of population in some selected countries. In view of high fertility and low life expectancy in India, it presents a demographic character of expansive or youthful population with broad base and a very narrow peak (Fig. 3.4). Ethiopia and Bangladesh (Fig. 3.5 and Fig. 3.6) also present almost same type of age-sex pyramid with wide base representing higher fertility and lower life expectancy.

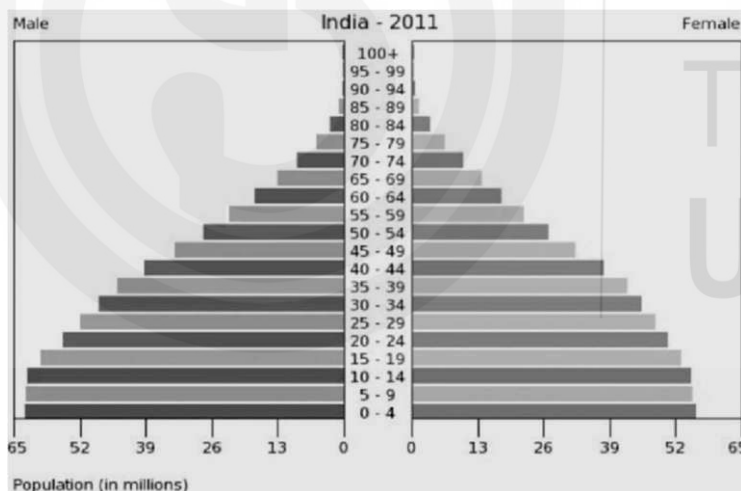


Fig. 3.4: Age-Sex Pyramid of India, 2011.

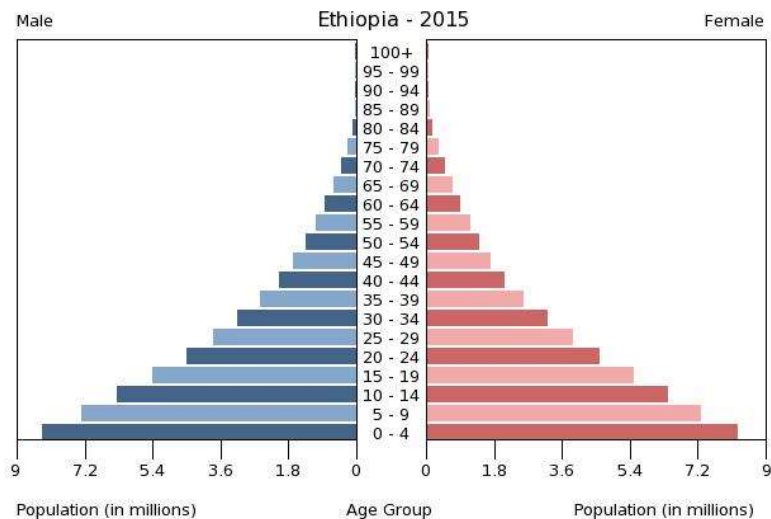
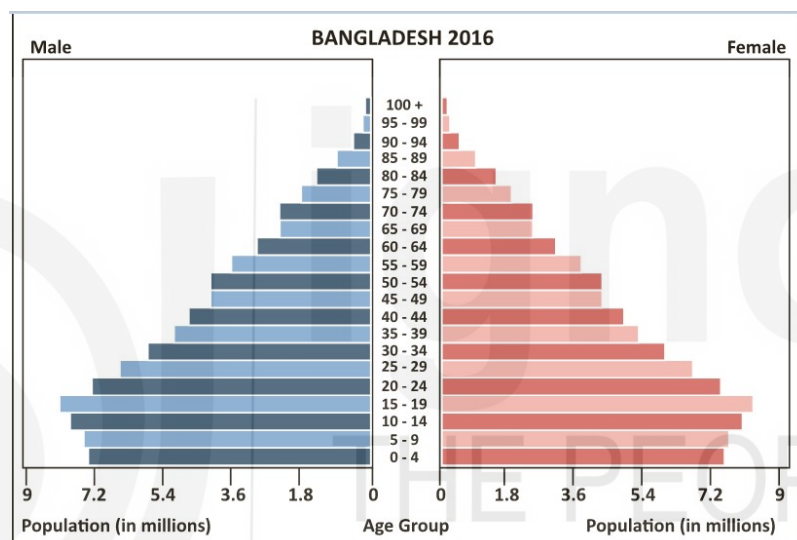


Fig. 3.5: Age-Sex Pyramid of Ethiopia, 2015.



Expansive Age - Sex pyramid

Fig. 3.6: Age-Sex Pyramid of Bangladesh, 2015.

The USA and Australia experience low fertility rate with increasing life expectancy. Hence, both these two developed countries are characterised by constrictive pyramid reflecting population ageing (Fig. 3.7 and Fig. 3.8).

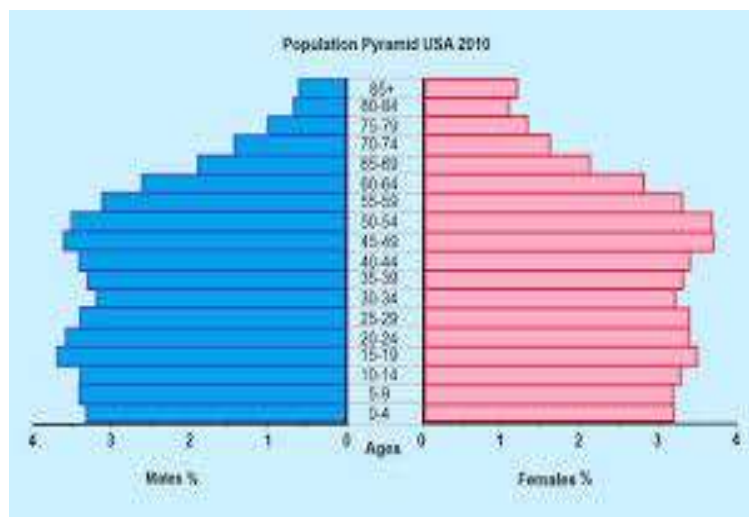


Fig. 3.7: Age-Sex Pyramid of USA, 2010.

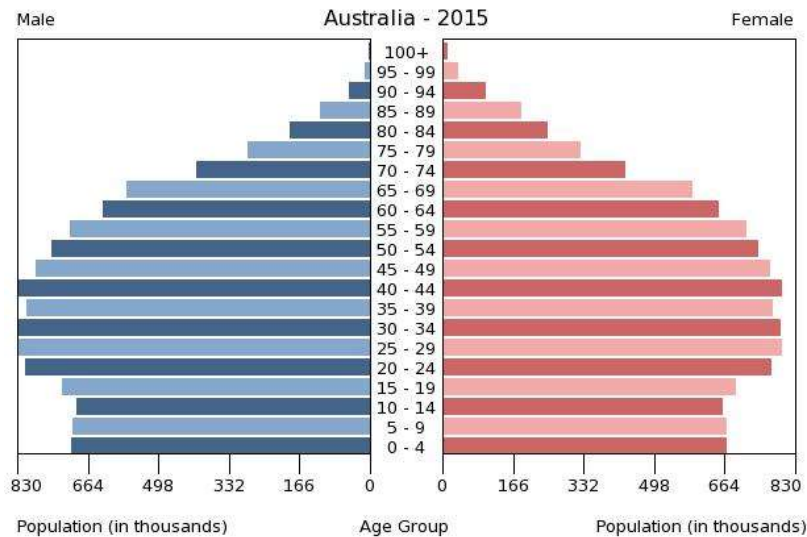


Fig. 3.8: Age-Sex Pyramid of Australia, 2015.

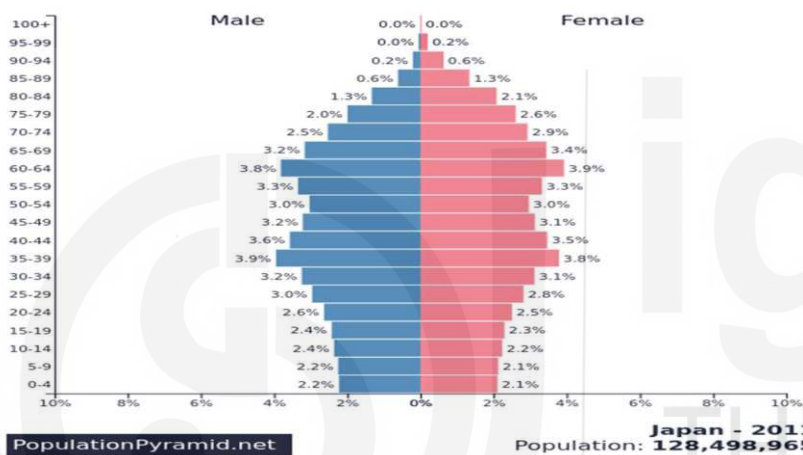


Fig. 3.9: Age-Sex Pyramid of Japan, 2011.

As Japan has completed all the stages of demographic transition, it now experiences very low fertility rate, which sometimes becomes lower than even mortality rate. Under such circumstances, its pyramid is characterised by stationary and aged population with narrow base and considerably wider middle and top (Fig. 3.9).

3.5 ECONOMIC COMPOSITION

After discussing demographic composition in the previous three sections, in this section we will discuss important economic composition namely work participation and occupational structure. Like demographic composition, attempt has been made to describe the concepts, and determinants related to work participation and occupational structure. This section will also highlight spatial pattern both at global and India level.

3.5.1 Concept and Determinants

The participation of the people of one area in economic activities greatly influences the economic development of the area and its people. Actually economic composition of population of an area refers to participation rate in economic activity or work and the type of activity or work involved in. The

people who are engaged in some economic activity constitute the workforce or manpower. The types of economic activity called occupational composition depend on diversity in availability of resources and infrastructures including human education and skill. The population census organizations of different countries are responsible for collecting the data about workforce or labour force and its occupational composition. But, there exists serious problem with respect to availability of such data for all countries for comparison due to lack of regularity in data collection, data collection at different points of time and varying definition of worker and other related aspects. In view of this, the efforts made by the United Nations towards standardisation of the concepts of various population attributes need to be appreciated.

So far manpower or workforce is concerned, it consists of the people who are engaged in economically gainful activities to produce goods and services. They are also treated as economically active population consisting of both males and females. As per this definition, the persons engaged in activities like household duties in their own house, retired personnel, inmates of institutions, students, pensioners, etc are not considered as manpower or economically active population. The magnitude of economically active population of an area can be measured in terms of work participation rate, crude activity rate, general activity rate, effective work participation rate, age-sex specific work participation rate, economic dependency ratio, etc. In India, for the purpose of understanding work participation rate, the Census of India divided the population of an area into working population (Workers) and non-working population (Non-workers). As per the Census of 1961, worker is defined as a person whose main activity is participation in any economically productive work either physically or through mental activity. At the time of 1981 Census in India, a worker can be main worker and marginal worker. The main workers are those who work for more than half of a year, i.e. more than 183 days. On the other hand, the people who are engaged in some economic activity for less than half of a year, i.e. less than 183 days are known as marginal workers.

The proportion of workforce, i.e. work participation rate of an area depends upon a variety of demographic, social and economic factors. Demographically, the total population base, birth rate, age structure, life expectancy, the migration behaviour and average size of the family are important. Among the social and economic factors, literacy and education, status of women in the society, age at marriage, general health standards, type of economy, availability of employment opportunities and levels of income are significant. Among the demographic factors, the fertility rate and associated age composition is found to be very important in determining the magnitude of workforce in an area. Accordingly, the less developed countries experiencing high fertility and rapidly growing children population record low proportion of working population. In contrast, the developed countries characterised by low fertility, low proportion of children population and ageing witness considerably high work participation rate and low economic dependency ratio. It means the areas experiencing high life expectancy contribute to the growth of working force. Again, the volume of migration, which is mostly age-selective in favour of working age population, also

influences the areas experiencing in-migration through its rising work participation rate.

The level of literacy and education influences work participation somewhat negatively. It is generally observed that the areas having high literacy rate and educational attainment witness low work participation, as the process of acquiring higher education considerably delays entry into workforce. Hence, other things remaining the same, the educationally advanced societies record lower work participation rate as compared to that of educationally backward ones. On the other hand, the status of women in a society acts positively towards increase in the participation rate. It means that the countries where the status of women is low and there is prejudices against female mobility outside, the participation of women in workforce remains very low. The age at marriage both among the males and females also influences the work participation rate. In fact, the societies where early marriage is common, the work participation becomes more due to family responsibility. The prevalence of good health condition in the population of an area influences growth of workforce. The general level of income and associated standard of living also influences work participation. Accordingly, the societies in poverty or having very poor income level compel high work participation irrespective of gender and age. In fact, the prevalence of poverty in many societies is responsible for the growth of child labour participation. On the other hand, the societies enjoying higher standard of living keep work participation rate much lower.

3.5.2 Analysis

The economic composition of population of an area may be analysed with respect to work participation rate, economic dependency rate and occupational structure.

- a) Work Participation Rate
- b) Economic Dependency Rate
- c) Occupational Structure

It varies by space (place), gender and age. As already mentioned, work participation rate is nothing but the proportion of working population to total population, which is expressed in percentage. It is generally observed in most parts of the world that the earning of bread is primarily a male responsibility, and hence female work participation has been lower than that of male in most parts of the world (Mehta, 1967). The other factors which influence the extent of female participation in workforce include the prevailing status of women in the society, the freedom of movement, ecological compulsion, the economic exigencies, availability of suitable jobs for females and the desire among the females to take part in economic activities (Chandna, 1967). The work participation rate varies spatially from one place to another, between developed and less-developed countries, and between rural and urban areas depending on prevailing variation in demographic and socio-economic characteristics. In view of this, the work participation rate is found to be more in the less developed countries, agricultural economies and rural areas as compared to that in the developed countries, industrial economies and urban areas. Moreover, work participation rate also varies with respect to age. Generally, it is more in the adult age group of 18-65. But, due to prevalence of

higher proportion of children population, poverty and school drop-out in the less developed countries including India, the child labour participation has become quite significant, although some legal measures are introduced. On the other hand, due to higher proportion of adult population, the work participation among them remains quite high in the developed countries.

The dimension of workforce in the population of an area may be estimated through economic dependency ratio. It is defined as the proportion of non-working population to working population, which is expressed in percentage. Sometimes, it is also estimated based on data on age composition of population. Accordingly, it is defined as the proportion of children and aged population to adult population, which is expressed in percentage. In the case of economic dependency ratio, the areas where economically active working population is more, the dependency is low and as such human resource development is high.

The occupational composition refers to the type of economic activities in which the workers of a place are engaged. The pattern of occupational composition and its diversity depends on resource-base, and the type of economy, and accordingly the proportion of workers under different economic sectors like primary (primarily agro-based), secondary (primarily industry-based) and tertiary (primarily trade and service-based) varies from one place to another. Generally, there is dominance of primary sector in rural areas, and secondary and/or tertiary sectors in the urban areas. It means that the degree of occupational diversity is more in technologically advanced urban areas. As the level of urbanization is very high (more than 80 per cent) in the developed countries, the occupational diversity is also very high.

As the people across the world are involved in a large variety of occupations and the number of occupations also varies from one country to another, for the study of occupational composition in a country and to carry out international comparison in this respect, United Nations recommended a number of industrial classification schemes at different points of time. One of such schemes is given below:

1. Agriculture, forestry and fishing;
2. Mining and quarrying;
3. Manufacturing industries;
4. Electricity, gas, water and sanitary services;
5. Construction;
6. Commerce;
7. Transport, storage and communication;
8. Services; and
9. Not classified elsewhere.

With slight modifications, the Census of India adopted the following industrial classification during its 1971 and 1991 Census:

1. Cultivation;
2. Agricultural labour;
3. Livestock, forestry, fishing, hunting, plantations, orchards and allied activities;
4. Mining and quarrying;

5. Manufacturing, processing, servicing and repairs:
 - i. Household industry; and
 - ii. Other than household industry
6. Construction;
7. Trade and Commerce;
8. Transport and storage; and
9. Other services.

This nine-fold industrial classification of Census of India, which is almost similar to that of United Nations scheme, can be put under three broad economic sectors as follows:

1. Primary sector: Cultivation; Agricultural labour; Livestock, forestry, fishing, hunting, plantations, orchards and allied activities; and Mining and quarrying, i.e. (i) to (iv).
2. Secondary sector: Manufacturing, processing, servicing and repairs: Household industry, Other than household industry and Construction, i.e. (va) to (vi).
3. Tertiary sector: Trade and commerce, Transport and storage, and Other services, i.e. (vii) to (ix).

It may, however, be mentioned here that the four-fold industrial classification as introduced in 1981 Census has also been followed in 2001 and 2011 Census as follows:

- (i) Cultivators;
- (ii) Agricultural labourers;
- (iii) Household industrial workers; and
- (iv) Other workers.

On the basis of this industrial classification scheme grouping can be done for workers under Agricultural sector, i.e. (i) and (ii); and Non-agricultural sector, i.e. (iii) and (iv).

For the purpose of analysis of occupational composition of workers, the proportion of workers to total workers under each class or category in percentage is found out. This can also be found out at occupational sector level, such as primary, secondary and tertiary, or for agricultural and non-agricultural sectors. The degree of diversification in occupation in secondary and tertiary sectors or non-agricultural sector in an area is indicative of growth and dynamism in the economy. Besides, occupational mobility from one occupation to another from generation to generation or within each single individual also speaks about overall growth of the economy.

3.5.3 World Pattern of Work Participation Rate and Occupational Composition

The work participation rate is generally calculated worldwide for the population of working age group (15-64). Accordingly, it is found to be 59 per cent in the world as per estimate for 2021. But, the trend of work participation in the world since 1990 has been a declining one. The decline has been such that it was as high as 65 per cent in 1990, and thereafter it decreased to 64

per cent in 2000 and 62 per cent 2010. It, however, varies significantly among different regions of the world. It is in fact quite low in the Middle East and North Africa (45 per cent) and South Asia (48 per cent), moderate in Europe and Central Asia (58 per cent) and very high in East Asia & Pacific (67 per cent) and Sub-Saharan Africa (66 per cent). On the other hand, among the countries and territories of the world, the work participation rate varies from 31 per cent in Djibouti to as high as 85 per cent in Madagascar. The gender disparity in work participation marked by 74.2 per cent for male and 47.2 per cent for female has also been quite significant in the world. Among the countries, Qatar records the highest male work participation rate (94.7 per cent) and Moldova records the lowest (46 per cent). In the case of female work participation, it varies from as low as 5.8 per cent in Yemen to as high as 83.4 per cent in Madagascar (HDR, 2020).

Among the top 10 populous countries of the world are concerned, the work participation rate among population in age group 15+ is found to vary from as high 68 per cent in China and Indonesia to as low as 46 per cent in India as against the world average of 59 per cent (Table 3.7). Although female work participation rate is lower than the male counterparts in all countries, it is the lowest in India (20.5 per cent) and Pakistan (21.9 per cent), and highest in China (60.5 per cent), accordingly the gender disparity in work participation is very high in India and Pakistan, and very low in China, Russia, USA and Nigeria (Table 3.7). So far the proportion of skilled workers is concerned, it is strikingly high in the developed countries like USA (96.5 per cent) and Russia (96.1 per cent), and the lowest in India (21.2 per cent), followed by Bangladesh (25.8 per cent) and Pakistan (27.8 per cent). Such a low proportion of skilled workers in India, Bangladesh and Pakistan is largely associated with dominance of agricultural workers, which is as high as 49.7 per cent in India, followed by 47.5 per cent in Bangladesh and 43.5 per cent in Pakistan as against 1.6 per cent in USA and 6.7 per cent in Russia. In contrast, the proportion of workers in services is very high in USA, Brazil and Russia.

Table 3.7: Work Participation Rate, Proportion of Skilled Workers and Proportion of Workers in Agriculture and Services in Top 10 Populous Countries of the World, 2016.

Country	Work Participation Rate (As percentage of 15+ population)			Skilled Workers as percentage of Total Workforce (2019)	Agricultural Workers as Percentage of Total Workforce	Workers in Services as Percentage of Total Workforce
	Total (2021)	Female (2019)	Male (2019)			
1. China	68.0	60.5	75.3	-	2.5	47.0
2. India	46.0	20.5	76.1	21.2	49.7	28.7
3. USA	61.0	56.1	68.2	96.5	1.6	81.2
4. Indonesia	68.0	53.1	81.9	42.0	34.3	44.8
5. Pakistan	50.0	21.9	81.7	27.8	43.5	34.0
6. Brazil	58.0	54.2	74.1	65.7	14.5	76.6
7. Nigeria	54.0	47.9	57.9	41.4	-	-
8. Bangladesh	57.0	36.3	81.4	25.8	47.5	35.3

9. Russia	61.0	54.8	70.2	96.1	6.7	65.8
10. Mexico	59.0	44.2	78.5	41.6	13.4	62.4
World	59.0	47.2	74.2	47.3	26.2	50.4

(Source: <https://data.worldbank.org> and Human Development Report, UNDP, 2016 & 2020, Oxford University Press.)

SAQ 8

Which one of the following countries records the lowest female work participation rate?

(A) China (B) Bangladesh (C) Pakistan (D) Nigeria

3.5.4 Spatial Pattern of Work Participation Rate and Occupational Composition in India

It is clearly observed in the foregoing discussion that the work participation rate in India has been quite low as compared to the global average and many other countries of both developed and less-developed worlds. However, there has been slight increase in the participation rate during 1981-2011 (Table 3.8). The prevalence of significantly low work participation among the females is responsible for keeping the overall participation rate so less in the country. It is, however, encouraging to note that the rise in work participation rate is considerably higher among the females as compared to the males in the country. This is more so in the case of marginal work participation (Table 3.9). Moreover, the work participation rate has been slightly higher in the rural areas of the country as compared to its urban areas (Table 3.10).

Table 3.8: Trend of Total Work Participation Rate in India, 1981-2011

Census Year	Total Work Participation Rate (in per cent)		
	Person	Male	Female
1981	35.7	51.1	19.2
1991	37.1	51.1	22.1
2001	39.1	51.8	25.6
2011	39.8	53.2	25.6

(Source: Census of India, 1981, 1991, 2001 and 2011, India, PCA.)

Table 3.9: Trend of Marginal Work Participation Rate in India, 1981-2011

Census Year	Marginal Work Participation Rate (in per cent)		
	Person	Male	Female
1981	3.2	1.0	5.6
1991	3.3	0.6	6.3
2001	8.8	6.7	11.0
2011	9.9	9.4	10.3

(Source: Census of India, 1981, 1991, 2001 and 2011, India, PCA.)

Table 3.10: Work Participation and Occupational Composition in Rural and Urban Areas of India, 2011

Total/Rural/Urban	Work Participation	Occupational Composition (As percentage of total main workers)
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	Rate (%)	Cultivators	Agricultural Labourers	Household Industry	Others
Total	39.8	26.4	23.7	3.4	46.5
Rural	41.8	37.7	32.9	2.9	26.5
Urban	35.3	2.6	4.4	4.3	88.7

(Source: Census of India, 2011, India, PCA.)

So far the spatial variation in work participation rate among the states and union territories of the country is concerned, it is found to be as high as 51.8 per cent in Himachal Pradesh and as low as 29 per cent in Lakshadweep (Table 3.11). Such a marked variation in work participation across the country is largely associated with resource base, economic opportunity, level of urbanization and women's status. Accordingly, work participation is considerably low in highly urbanised areas like NCT of Delhi, Chandigarh, etc.

In the case of occupational composition, India as a whole records around 50 per cent workers engaged in agricultural sector. However, there exists marked spatial variation in occupational composition across the country. Among the states and union territories in the country, there is dominance of workforce in agricultural sector (above 50 per cent) in Bihar, Chhattisgarh, Madhya Pradesh, Andhra Pradesh, Rajasthan, Uttar Pradesh, Nagaland, Arunachal Pradesh, Manipur, Mizoram, Meghalaya and Odisha (Table 3.11). On the other hand, the non-agricultural workforce

highly dominates (above 80 per cent) in Chandigarh, NCT of Delhi, Daman & Diu, Dadra & Nagar Haveli, Goa, Lakshadweep, Kerala, Puducherry and Andaman & Nicobar Islands (Table 3.11). As these areas are associated with high level of urbanization, the degree of occupational diversity in non-agricultural sector is found to be very high, and as such the degree of resource mobilisation and economic development has also been remarkably high.

Table 3:11: Work Participation Rate and Occupational Composition at State/Union Territory Level in India, 2011

S. No.	States/Union Territories	Work Participation Rate (in percentage)	Occupational Composition (As percentage of total main workers)			
			Cultivators	Agricultural Labourers	Household Industry	Others
1.	Jammu & Kashmir	34.4	21.4	6.0	2.9	69.7
2.	Himachal Pradesh	51.8	44.5	3.3	1.5	50.7
3.	Punjab	35.6	21.3	13.8	3.5	61.4
4.	Chandigarh	38.2	0.5	0.3	1.3	97.9
5.	Uttarakhand	38.3	36.4	8.6	2.6	52.4
6.	Haryana	35.1	27.9	12.7	2.8	56.6
7.	NCT of Delhi	33.2	0.5	0.5	3.1	95.9
8.	Rajasthan	43.5	46.7	10.4	2.3	40.6
9.	Uttar Pradesh	32.9	34.8	21.8	5.5	37.9
10.	Bihar	33.3	25.3	44.6	3.6	26.5
11.	Sikkim	50.4	35.8	5.2	1.2	57.8
12.	Arunachal Pradesh	42.4	51.8	4.2	1.1	42.9

13.	Nagaland	49.2	56.7	3.2	1.2	38.9
14.	Manipur	45.6	47.9	4.6	4.7	42.8
15.	Mizoram	44.3	48.7	6.3	1.3	43.7
16.	Tripura	39.9	22.9	18.7	1.7	56.7
17.	Meghalaya	39.9	44.6	12.4	1.2	41.8
18.	Assam	38.3	36.1	10.3	2.8	50.8
19.	West Bengal	38.0	16.5	22.8	5.9	54.8
20.	Jharkhand	39.7	29.3	18.1	3.8	48.8
21.	Odisha	41.7	30.6	22.6	4.1	42.7
22.	Chhattisgarh	47.6	36.8	30.4	1.8	31.0
23.	Madhya Pradesh	43.4	36.1	29.2	2.8	31.9
24.	Gujarat	40.9	23.3	22.0	1.2	53.5
25.	Daman & Diu	49.8	1.4	0.4	0.4	97.8
26.	Dadra & Nagar Haveli	45.7	17.4	4.7	1.2	76.7
27.	Maharashtra	43.9	26.2	25.2	2.2	46.4
28.	Andhra Pradesh	46.6	18.4	39.9	3.5	38.2
29.	Karnataka	45.6	25.8	21.8	2.9	49.5
30.	Goa	39.5	5.2	2.2	2.2	90.4
31.	Lakshadweep	29.0	0.0	0.0	0.8	99.2
32.	Kerala	34.7	5.8	9.8	2.1	82.1
33.	Tamil Nadu	45.5	13.7	25.8	4.0	56.5
34.	Puducherry	35.6	2.6	12.7	1.6	83.1
35.	Andaman & Nicobar Islands	40.0	10.3	2.1	1.1	86.5
India		39.8	26.4	23.7	3.4	46.5

3.6 SUMMARY

In this unit you have studied:

- Being basically determined by fertility, mortality and migration, the age structure of any population influences the growth of population, employment pattern, age at marriage and education in any area. Most of the less developed countries of Africa, Asia and Latin America being characterised by high fertility witness large proportions of population in 0-14 age group. On the other hand, most of the countries of Europe and North America, record an age composition with low proportion of young population and relatively high proportions of adult and old age population.
- Age composition of population and its underlying characteristics can be understood through analysis of age grouping, age indices, age pyramid and median age of population. Among the age indices, dependency ratio and ageing index are popular.
- Globally the proportions of population are found to be 26 per cent in the age group 0-14, 64 per cent in 15-64 and 10 per cent in 65 and above as per 2021 estimate. Among the continents, the proportion of population in children age group (0-14) is found to be the highest in Africa (40 per cent) and lowest in Europe (16 per cent). Although there has been considerable decline in the proportion of population in age group 0-14 during 1975-2021 in the world, it has been quite slow in Africa and quite fast in Asia. It is

observed that in view of very high proportion of population in 65 and above age group in Japan, the values of both dependency ratio are found to be very high. On the other hand, Niger of Africa witnesses very high dependency ratio due to its very high proportion of population in 0-14 age group, and very low ageing index value owing to its very low proportion of population in 65 and above age group.

- Due to considerably high fertility and low life expectancy there is prevalence of high proportion of population in age group 0-14 and very low proportion of 65 and above population in India. However, there exists marked spatial variation in age composition of population among the states and union territories of the country depending on spatial variation in fertility behaviour, mortality behaviour, life expectancy, age-selective migration and rural-urban migration. The variation in age composition is also visible between rural and urban areas of the country. This phenomenon is clearly observed in the case of proportion of population in age group 0-14, which is found to be 32.8 per cent in the rural areas as against 26.2 per cent in the urban areas. This has resulted in higher dependency ratio in the rural areas (62.3%) as compared to that in urban areas (45.6%).
- Sex composition of population, which is measured in terms of sex ratio (number of females per thousand males) is found to vary significantly from one area to another depending on sex ratio at birth, sex ratio at death and sex ratio of migrants. As migration largely due to economic reason is mostly male selective, the areas experiencing in-migration witness excess of males in the population. This phenomenon is more prominent in the large urban areas and cities witnessing large-scale rural-urban migration.

It is observed that the sex ratio is high in the countries of Europe, North America and South America, and low in the countries of Asia and Africa. The low sex ratio in most parts of Asia and Africa could be largely due to excess of birth of males and prevailing high incidence of female child mortality.

There exists marked spatial variation in sex ratio in India as influenced by male-selective migration, rural-urban differential and prevailing variations in socio-economic characteristics with respect to ethno-religious and caste-based diversities and locational specifics. In view of male-selective rural-urban migration more particularly in the large urban areas of the country, the urban sex ratio in the country as per 2011 Census (929) remains lower than rural sex ratio (949).

- The participation of the people of an area in economic activities, which depends upon a variety of demographic, social and economic factors, greatly influences the economic development of the area and its people. Accordingly, the less developed countries experiencing high fertility and rapidly growing children population record low proportion of working population. In contrast, the developed countries characterised by low fertility, low proportion of children population and ageing witness considerably high work participation rate and low economic dependency ratio. In fact, the prevalence of poverty in many societies is responsible for the growth of child labour participation. On the other hand, the societies enjoying higher standard of living keep work participation rate much lower.

- The work participation rate, which is generally calculated worldwide for the population of working age group (15-64). Accordingly, it is found to be 59 per cent in the world as per estimate for 2021. It, however, varies significantly among different regions of the world. It is in fact quite low in the Middle East and North Africa (45 per cent) and South Asia (48 per cent), moderate in Europe and Central Asia (58 per cent) and very high in East Asia & Pacific (67 per cent) and Sub-Saharan Africa (66 per cent). Among the countries, Qatar records the highest male work participation rate (94.7 per cent) and Moldova records the lowest (46 per cent). In the case of female work participation, it varies from as low as 5.8 per cent in Yemen to as high as 83.4 per cent in Madagascar.

So far the proportion of skilled workers is concerned, it is strikingly high in the developed countries like USA (96.5 per cent) and Russia (96.1 per cent), and the lowest in India (21.2 per cent), followed by Bangladesh (25.8 per cent) and Pakistan (27.8 per cent). Such a low proportion of skilled workers in India, Bangladesh and Pakistan are largely associated with dominance of agricultural workers. In contrast, the proportion of workers in services is very high in USA, Brazil and Russia.

- The prevalence of significantly low work participation among the females is responsible for keeping the overall participation rate so less in India. It is, however, encouraging to note that the females witnessed faster growth of work participation as compared to the males in the country. Moreover, the work participation rate has been slightly higher in the rural areas of the country as compared to its urban areas.

So far the spatial variation in work participation rate is concerned it is found to be as high as 51.8 per cent in Himachal Pradesh and as low as 29 per cent in Lakshadweep. In the case of occupational composition, India as a whole records around 50 per cent workers engaged in agricultural sector. Among the states and union territories in the country, there is dominance of workforce in agricultural sector (above 50 per cent) in Bihar, Chhattisgarh, Madhya Pradesh, Andhra Pradesh, Rajasthan, Uttar Pradesh, Nagaland, Arunachal Pradesh, Manipur, Mizoram, Meghalaya and Odisha. On the other hand, the non-agricultural workforce highly dominates (above 80 per cent) in Chandigarh, NCT of Delhi, Daman & Diu, Dadra & Nagar Haveli, Goa, Lakshadweep, Kerala, Puducherry and Andaman & Nicobar Islands. As these areas are associated with high level of urbanization, the degree of occupational diversity in non-agricultural sector is found to be very high, and as such the degree of resource mobilisation and economic development has also been remarkably high.

3.7 TERMINAL QUESTIONS

1. With appropriate illustrations discuss the patterns of age composition of population in different parts of the world.
2. With reference to broad age groups of population, present a picture of spatial patterns of age composition of population in India.
3. Define dependency ratio and ageing index of population, and discuss their spatial pattern in the world and associated implications.

4. Mention the factors influencing variation in sex ratio and present a regional picture of sex ratio in the world.
5. What are the causes behind variation in sex ratio in India? Present a reasoned picture of spatial patterns of sex ratio in different spatial contexts.
6. Discuss the factors determining work participation in different parts of the world.
7. Is there any gender differential in work participation in the world? Present a picture of male and female work participation in different parts of the world.
8. What is occupational structure and occupational diversity? With supporting data present a spatial pattern of occupational composition in India.

3.8 ANSWERS

Self-Assessment Questions (SAQ)

1. The distribution of population with respect to age is called age structure of population. Its variation is basically determined by fertility, mortality and migration.
2. a) The broad age groups of population are 0-14 (children group), 15-59 or 15-64 (adult group) and 60 and above or 65 and above (old group). It reflects prevailing fertility pattern, life expectancy, availability of workforce and future growth pattern of population.
b) While dependency ratio refers to the ratio of children and elderly population to adult population, ageing index means the ratio of elderly population to children population. Both are generally expressed in percentage.
3. (a) Egypt (b) Japan
4. (D) Kenya
5. (B) Himachal Pradesh
6. (C) Brazil
7. (A) Punjab
8. (C) Pakistan

Terminal Question

1. Refer to Section 3.2.1 and 3.2.3 with reference to Table 3.1 and 3.2.
2. Refer to Section 3.2.4 with reference to Table 3.3.
3. Refer to Section 3.2.2 with reference to Table 3.2.
4. Refer to Section 3.3.1 and 3.3.2 with reference to Table 3.4 and 3.5.
5. Refer to Section 3.3.1 and 3.3.3 with reference to Table 3.6.
6. Refer to Section 3.5.1 and 3.5.2.
7. Refer to Section 3.5.3 with reference to Table 3.7.
8. Refer to Section 3.5.2 and 3.5.4 with reference to Table 3.11.

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THE PEOPLE'S
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UNIT 4

SOCIO-CULTURAL COMPOSITION

Structure

- | | |
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| 4.1 Introduction
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4.1 INTRODUCTION

Population scientists and population geographers have evinced much interest in the socio-cultural context of population dynamics as they have been found to have significant influence on other attributes of population such as fertility, mortality, growth or migration and many other demographic phenomena. You have already studied population distribution and growth in unit-2 of this block. You have also studied demographic and economic composition in the previous unit i.e. unit-3. The socio-cultural composition of the population such as ethnicity, culture, religion, caste and literacy etc. directly or indirectly influence other demographic characteristics of the population. Completely homogenous population is a rarity confined to geographically isolate small communities. Most people of the world display extraordinary diversity in their culture, language and religious affiliation, caste attachments and the levels of literacy attainment. These attributes of the population constitute a major thrust of all population analysis. Population geography too is concerned with these aspects as these attributes are unevenly distributed over space and time and with a focus on their unique regional patterns at different spatial scales- international, national, rural, urban etc. It is widely acknowledged that the success or failure of the population policies around the world is largely

dependent upon the incorporation of many of the crucial socio-cultural information. Socio-cultural attributes of the population composition are many and varied and it will not be possible to include all of them in this chapter. Only the most significant among them are considered here which include religious affiliation of the people, tribe and caste composition and literacy status and attainment- all of which vary significantly across countries and different regions within these countries. These attributes will be discussed more specifically with reference to India.

Expected Learning Outcomes

After studying this unit, you should be able to:

- Describe concept, determinants and spatial patterns of religion;
- Discuss concept, determinants and spatial patterns of caste and tribe composition; and
- Explain concept, determinants and spatial patterns of sources of literacy and levels of educational attainments.

4.2 RELIGION

India presents baffling diversity in the religious composition of her population. Almost all important religious faiths of the world have their followers in India's population albeit in varying proportion. Being the traditional land of Hinduism, the Hindus account for an overwhelming 79.8 percent of India's population. There are however significant proportion of the followers of other religious faiths and persuasions including Islam, Christianity, Sikhism, Buddhism, Jainism and Zoroastrianism, making the religious composition of India's population highly complex. Besides, there are tribal forms of religion too practiced by the tribal communities living in different parts of the country.

4.2.1 Concept

Diversity in religious persuasion has been one of the most traditional aspects of population composition. Most people identify themselves with one or the other religious faiths which has played a very important role in the history of human civilization occupying a central place in human life defining distinct attitudes to life. Although regarded a matter of personal faith, religious identity has been one of the most persistent factors in the social sphere engendering community feeling, social solidarity with the followers of a faith and development of common code of social conduct leading to divergences in socio-cultural practices among the followers of different faiths. These aspects of religion then impact behaviour of populations belonging to different religions affecting most demographic parameters. Moreover, followers of different religious faiths tend to cluster and concentrate over space creating distinct regions of religious landscapes.

4.2.2 Global Patterns

About 85 percent of world's population identify with one or the other religions. The remaining 15 percent is unaffiliated to any religion. Major religions with which people identify themselves are Christianity, Islam, Hinduism, Buddhism,

folk religions, Judaism, the unaffiliated and the other minor religions. Table 4.1 presents each religion's total estimated population for 2020:

Table 4.1: Religious Composition of World Population

Religion	Population
Christianity	2.38 billion
Islam	1.91 billion
Hinduism	1.16 billion
Buddhism	507 million
Folk Religions	430 million
Other Religions	61 million
Judaism	14.6 million
Unaffiliated	1.19 billion

(Source: <https://worldpopulationreview.com/country-rankings/religion-by-country>)

World's largest religion is Christianity followed by Islam and Hinduism. The folk religion refers to traditional African religions and Chinese folk religions, and both Native American and Australian aboriginal religions. 'Other religions' include smaller faiths such as Shintoism, Taoism, Sikhism, and Jainism. Significantly however nearly 1.2 billion people worldwide are those who are nonreligious or have atheist beliefs classified as 'unaffiliated' to any of the religions.

The present spatial pattern in distribution of these religious groups in different parts of the world reveal extreme regional concentration of various religious groups which in several ways reflect centuries of diffusion of some of the major religious groups. Though the religious affiliation of world's population is diverse, it is evident from table 1 that over 80 percent of the population belong to only three religious faiths namely Christianity, Islam and Hinduism.

People of Christian faith display largest areal spread including the Americas, Europe, Eurasia, Southern Africa and Australia. This religion finds its followers in all the continents with great spatial contiguity. Though confined to fewer continents, and much spatially restricted, Islam is a dominant religious faith in a contiguous belt across North Africa, the neighbouring Middle East and in Pakistan as well as in South East Asia and in Bangladesh in South Asia. The spatial contiguity in Muslim dominance in all these regions is broken by India which has the largest followers of Hinduism despite the presence of a sizeable number of Muslims constituting the largest religious minority in the country. Vast majority of the followers of Hinduism are confined to India alone. Buddhists are largely restricted to a few countries in Southeast Asia namely Myanmar, Thailand, Laos, Vietnam and Cambodia. Besides Bhutan, Sri Lanka and Mongolia are representing as outliers to this contiguous Buddhist belt. The Chinese religious realm is characterized by a mixture of traditional religions such as Taoism, Confucianism and Buddhism though a majority of the population in this country is unaffiliated to any religion. There are six countries where a majority of the population is unaffiliated to any religion. These are: Czech Republic, North Korea, Estonia, Japan, Hong Kong and China.

The diffusion of Christianity over most part of the globe is attributed to migration and missionary activities while the diffusion of Islam has taken place through conquering of territories and by large-scale conversion of people from other faiths.

4.2.3 Religious Composition of India's Population

The population of India displays a high degree of religious diversity in certain regions. As has been stated earlier, India is the traditional homeland of the Hindus who constitute an overwhelming 79.8 percent of the total population of the country as per the 2011 census counts. The numerical strength of the Hindu population however is not uniform across different regions of the country depending upon the extent of representation by population of other religious faiths of both indigenous (Indic) as well as faiths introduced from outside (extra-Indic). The former group includes followers of Buddhism, Jainism, Sikhism and a host of tribal forms of religions and the latter includes followers of Islam, Christianity and Zoroastrianism- religions which originated in West Asia and diffused into the country over a long period of time. The Muslim population which accounts for 14.23 percent of the population in 2011 constitutes the largest religious minority followed by the Christians who account for 2.3 percent of the total population. The Sikhs account for 1.72 percent of the population of India followed by the Buddhists (0.70%) and the Jains (0.37%).

The relative strength of different religious groups has not remained uniform over time. The Hindu population which accounted for 84.99 percent of the total population in 1951 has been consistently falling over the years with a corresponding increase in Muslim population which accounted for 9.93 percent (1951 Census) around the time India got independence. In the year 2011, the Hindus and Muslims accounted for 79.8 percent and 14.23 percent of the population respectively revealing higher rate of population growth experienced by the Muslim population compared to the population of other religious faiths. Relatively higher population growth among the Muslim population has been attributed to their poverty, lower literacy level and other such factors. However, recent data from the Census and National Family Survey reveals drastic decline in the growth rates among the Muslim population indicating a trend towards greater stabilization in their population in the near future. For example, the Muslim growth rate of population experienced a drastic decline in during 2001-2011 decade declined to 24.6 percent compared to 29.3 percent in the preceding decade. The decline in the growth rate in the Hindu population during the same period is much less dramatic as it fell from 19.9 percent to 16.8 percent. The relative share of population among the other religious groups has remained by and large unaltered over the period with the possible exception of the Buddhists who accounted for 0.7 percent of the population.

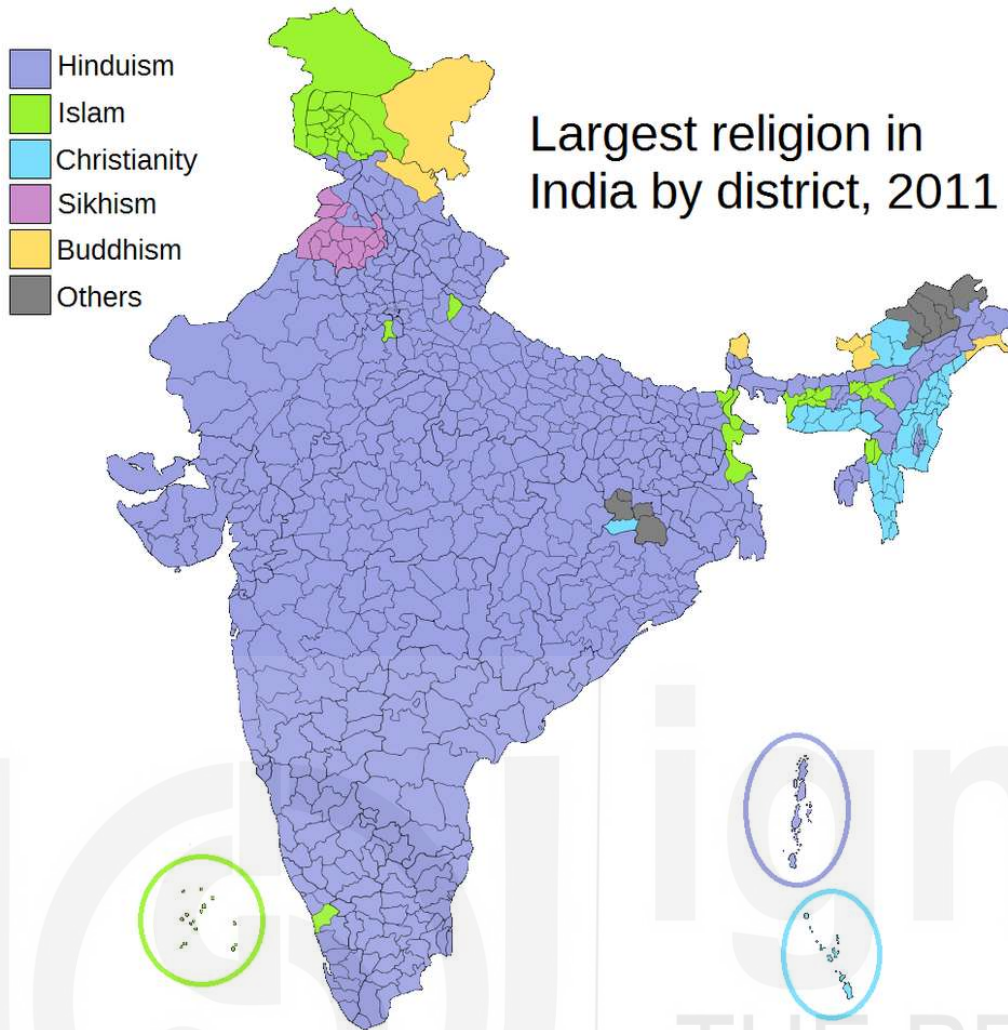


Fig. 4.1: India: Spatial Variation in Religious Composition.

(Source: Census of India, 2011)

4.2.4 Spatial Pattern in Religious Composition of India's Population

Despite the fact that the Hindus constitute overwhelming proportion of India's population, the spatial distribution of different religious groups brings out interesting patterns in the religious composition of India's population. As expected, fig.4.1 reveals that the Hindu population is numerically dominant in the population in vast majority of districts of India except some mostly located in the periphery of the country, such as in the North eastern States including parts of West Bengal adjacent to Bangladesh, Jammu and Kashmir, Punjab, some districts in Kerala, a few districts in Chotnagpur plateau and the islands located in Bay of Bengal and Arabian sea. It is in these areas the numerical superiority of the Hindu population has been greatly diluted by the presence of people of other religious faiths. Thus the geographical periphery of the country is characterized by a greater diversity in religious composition of her population compared to the interior where the population composition is marked by Hindus vastly outnumbering followers of other religious faiths. The hilly districts of the Northeast display a high degree of religious diversity in their population, largely due to the presence of Christian population who constitute majority in the states of Mizoram, Nagaland, and Meghalaya as well

as in the hilly districts of Manipur and some districts in Arunachal Pradesh where they account for over 50 percent of the population. Muslims constitute a majority in a few districts of Brahmaputra and Barak valleys of Assam as well as in the districts of west Bengal adjacent to Bangladesh. Muslims constitute a majority in many districts of Jammu and Kashmir and over 45 percent of Ladakh's population. The Muslim community has a large presence in the population of Kerala and constitutes over 50 percent of the population in Malapuram district. The people of Lakshadweep islands are overwhelmingly Muslim in their population composition. Besides a few districts in the Western Gangetic plains are Muslim dominated.

The Buddhists account for a majority or a very large share of the population in a few districts spread over Ladakh, North Sikkim, extreme West and East Arunachal Pradesh. Though widely distributed over the country, the Sikh population is largely concentrated in most districts of Punjab where they constitute over 50 percent of the population and have significant presence in adjacent districts in Haryana and Rajasthan. The Jains are numerically insignificant but are largely concentrated in the states of Rajasthan, Gujarat and Maharashtra. Zoroastrians- known as the Parsi community in India are numerically insignificant and are mostly found in Maharashtra and is a community experiencing decline in their total population over the years.

An interesting characteristic of the demography of the religious groups in India as per 2011 census refers to a greater urban composition of the population belonging to religious minorities in India, particularly the Jains (80%), Buddhists (43%) Muslims and Christians (40% each). In contrast Sikhs are largely rural in their population composition.

The religious composition of India's population underwent significant changes in the wake of partition of the country in 1947 that witnessed massive exodus of Muslim population in North India and counter balanced by the migration of Hindus and Sikhs from West and East Pakistan.

SAQ I

- a) What are the folk religions?
 - b) Name the four religious minorities in India that have greater urban composition of the population.
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4.3 CASTE AND TRIBE COMPOSITION

India's population is characterised by extremely diverse ethnic and cultural elements. Ethnic differences are based primarily on account of differences in language affiliation and religious persuasions of her people. Caste as a factor in social and cultural differentiation is unique to India and is largely a feature of the Hindu religious group which constitutes an overwhelming 79.8 percent of her population. Features of caste system find their way into other religious groups too. Many of the social and cultural characteristics of India's population are also shared by the peoples living in Pakistan, Bangladesh, Nepal, Bhutan, and Sri Lanka.

Constituting over 8 percent of the population, the ethnic diversity of India's population gets further accentuated with the presence of a legion of tribal communities. They are mainly identified as 'scheduled tribes' by the government who are believed to be the 'original' inhabitants of the country. By and large rural in their composition, these tribes are generally concentrated in the hilly, mountainous and other geographically inaccessible tracts of the country constituting a significant share of the socially and economically marginalised sections of India's population.

4.3.1 Concept

The ethnic component is represented by a legion of caste groups and tribal communities present in the population of India adding to the diversity to India's population composition. A fundamental attribute of India's social structure, caste had and continues to have powerful influence on almost all aspects of social and economic life and exercises its influence on the demographic parameters through intersectionalities of sex, gender, class, religion and the like. Inherited caste identities have to a great extent determined social and economic status and are generally perceived to be a factor in the persistence of caste based inequality and discrimination. Of particular significance are the Scheduled Castes who have been historically disadvantaged due to their position at the bottom of the caste hierarchy and suffering from deprivation, poverty and marginalization. Likewise, the tribal communities in India too constitute bulk of India's deprived and marginalized sections who have historically lived in geographically inaccessible areas represented by the mountains and hills, the forested tracts and the arid and marshy lands that provided little scope for full grown agrarian development and have hence suffered from varying degrees of isolation from the thrust of development in the colonial period and after. Together, the Scheduled castes and the Scheduled Tribes constitute a large chunk of the marginalized population which has necessitated the extension of affirmative action in order to improve their lot as enshrined in the constitution of India. Article 46 of the Indian constitution states that "the State shall promote with special care the educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and shall protect them from social injustice and all forms of exploitation." Articles 341 and 342 of the Constitution define as to who would be Scheduled Castes and Scheduled Tribes with respect to any State or Union Territory.

4.3.2 The Scheduled Castes of India: Aspects of Demography and Spatial Distribution

Discontinuation of enumeration of Caste particulars by Indian Census prevents a detailed analysis of caste composition of population. The only time caste data was collected dates back to 1931 Census operation after which no such data is available. Successive Census enumeration in the post-Independence period has eschewed information on individual caste groups as a matter of policy except for the Scheduled castes. The following section presents aspects of demography and distribution of the scheduled castes only.

Accounting for 16.64 percent the scheduled castes in 2011 constituted a significant proportion of India's population. At the national level, one out of every six persons is a scheduled caste revealing the numerical importance of these groups in the population composition of the country. They are distributed throughout India constituting varying proportion of the population in different geographical regions of the country. However, they are not a homogenous category as there are 1284 (as on 2017) castes listed as scheduled castes distributed in different states and union territories of India. These communities are overwhelmingly rural in their population composition as 79.8 percent of the scheduled caste population living in rural areas in 2011. This is not surprising considering their overwhelming dependence on agriculture and/or rural crafts and services generally considered 'polluting' or 'unclean'. The degree of landlessness is also much higher among this segment of population which compels them to take up agricultural wage earning as a major occupation. In the urban areas, they are largely employed as industrial workers and in service sector.

The Scheduled caste population increased from 64.4 million in 1961 to 201.3 million in 2011. The share of the Scheduled caste population is steadily increasing over the years. They constituted 14.67 percent of the total population of India in 1961 which increased to 16.48 percent by the year 1991. Their share in the population marginally increased to 16.64 percent in 2011 census count. The increasing share of Scheduled Caste population is attributed to faster natural growth as well as additions of more castes to the list of Scheduled Castes over the years. Additions of 20 communities to the category of Scheduled castes has resulted in an increase in their number from 1221 in 2001 to 1241 in 2011. The additions however are only a marginal factor in the increase of their share in the total population. Higher rate of growth is the main factor pushing the relative share of the Scheduled Caste in India's population. This is evident from the fact that the growth rate of the Scheduled caste population has been significantly higher than the overall. For example, the scheduled caste population increased by 20.84 percent in the 2001-2011 decade compared to only 17.07 percent increase registered by the overall population in the same period.

Though a vast majority of the Scheduled Caste communities still lives in rural areas, their share in urban areas is steadily increasing in the recent times. In 2001, around one fifth (20.4%) of them lived in urban areas which increased to 23.6 per cent by the year 2011. More than three-fourths of India's SCs are still living in rural areas, but the number of Scheduled Castes living in urban areas has experienced over 40 percent increase. This increase is attributed to accelerated migration of these groups from the rural to urban areas mostly in search of employment opportunities in the latter. According to R.C. Chandna, much of this movement is taking place to rapidly growing industrial/urban centers.

The spatial distribution of the Scheduled Castes displays striking variation in population composition of India's population in different states and union territories and geographical regions. At a broad level, the Scheduled caste population displays a strong tendency of clustering in the alluvial plains of the country. These areas with a high concentration of Scheduled caste population include the plains of the North and the coastal plains. It is in these areas they

constitute a significant proportion of the population. In sharp contrast, their share in the total population falls dramatically in areas characterized by rugged terrain, generally unsuitable to intensive agriculture. Such areas include the central Vindhyas spread over parts of Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Chhattisgarh, Chotanagpur plateau, Odisha highlands, and the North East. The population of these areas has a low concentration of Scheduled Caste population. In some of these areas such as Nagaland, Arunachal Pradesh, the Scheduled castes are conspicuous by their absence. They are also completely absent in the population of the two islands.

Table 4.2: India: Scheduled Caste population, 2011

State/UTs	% SCs to Total Population	Rank
Andhra Pradesh	16.41	12
Arunachal Pradesh	0.00	-
Assam	7.15	20
Bihar	15.91	13
Chhattisgarh	12.82	15
Goa	1.74	23
Gujarat	6.74	21
Haryana	20.17	5
Himachal Pradesh	25.19	2
Jammu & Kashmir	7.38	19
Jharkhand	12.08	16
Karnataka	17.15	11
Kerala	9.10	18
Madhya Pradesh	15.62	14
Maharashtra	11.81	17
Manipur	3.41	22
Meghalaya	0.58	24
Mizoram	0.11	25
Nagaland	0.00	-
Odisha	17.13	10
Punjab	31.94	1
Rajasthan	17.83	8.5
Sikkim	4.63	23
Tamil Nadu	20.01	6
Tripura	17.83	8.5
Uttar Pradesh	20.70	4
Uttarakhand	18.76	7
West Bengal	23.51	3
Union Territories		
A & N Islands	0.00	-
Chandigarh	18.86	1
D & N Haveli	1.80	5
Daman & Diu	2.52	4
NCT of Delhi	16.75	2
Lakshadweep	0.00	-
Puducherry	15.73	3

The inter-state comparison of the proportion of the scheduled caste in the total population of these states and union territories reveal striking contrasts (table-2). The Scheduled caste population constitutes nearly a third (31.94%) of Punjab's population. Their concentration in the total population varies between 20-25 percent in Himachal Pradesh, West Bengal, Uttar Pradesh, Haryana and Tamilnadu. All these states except Tamilnadu are located in the Northern plains. Even Tamilnadu in the peninsular plateau region has much of its area lying in the vast delta formed by the Kaveri River. About 15-20 percent of the population consists of Scheduled castes in the states of Uttarakhand, Rajasthan, Bihar, and Madhya Pradesh as well as in Odisha and Andhra Pradesh in the eastern coast and Karnataka in the peninsular interior. The union territories of Chandigarh, NCT of Delhi and Puducherry too have similar proportion of Scheduled Castes in their population.

Concentration of Scheduled Castes thins out in the remaining states of India as its proportion falls much below the national average. Only Chhattisgarh, Jharkhand and Maharashtra record 10-13 percent of their population consisting of Scheduled Castes while it ranges between 5-10 percent in Kerala, Jammu and Kashmir, Assam and Gujarat displaying low concentration of Scheduled castes their population. The population composition of states like Manipur, Goa, Meghalaya, and Mizoram and Union Territories such as Dadra and Nagar Haveli as well as Daman and Diu have negligible share of their population classified as Scheduled Castes.

Around half of all Scheduled caste population is confined to just four states namely Uttar Pradesh (20.5%), West Bengal (10.7%) and Bihar (8.2%) in the Northern plains and Tamil Nadu (7.2%) in the Kaveri Delta. The spatial pattern in the concentration of Scheduled Caste population thus reveals positive association with areas that support intensive cultivation and is negatively associated with areas dominantly inhabited by Scheduled Tribes. The history of conversion of castes belonging to lower rungs of caste hierarchy to other religions too has reduced their proportion in the population in some areas, particularly in areas of Muslim concentration.

4.3.2 The Scheduled Tribes of India: Aspects of Demography and Spatial Distribution

Indian Population subsumes within itself a legion of tribal communities adding to its ethnic diversity. Along with the Scheduled Castes, the tribal communities too are among the poorest and marginalized sections of India's population. Due to their social and economic backwardness, article 366 (25) of the Indian Constitution defines them as Scheduled Tribes to include such tribes or tribal communities or part of or groups within such tribes or tribal communities as are deemed under Article 342. The Census of India regularly publishes data on different demographic and social aspects of the Scheduled Tribes. They are ethnically, economically, socially and culturally most heterogeneous. Though they constitute only 8.6 percent of the population, the extent of ethnic diversity found among them is extraordinary with 705 communities identified as Scheduled Tribes in the year 2011. Of these, as many as 75 communities have been classified as Particularly Vulnerable Tribal Groups.

The proportion of the Scheduled tribes in country's total population is steadily increasing over the years. They constituted 7.83 percent of the country's population in 1981 which increased to 7.95 percent in 1991, 8.2 percent in 2001 and 8.6 percent in 2011- registering an increase of nearly one percent in their share. This is largely due to relatively higher growth rate in their population as well as addition to the list of Scheduled Tribes in these decades. The rate of growth experienced by these communities was the highest during 1971-81c decade (35.8%), and declined thereafter in line with other constituents of the population but remains much higher than the growth rate in the total and the scheduled caste population. For example, the Scheduled tribes population increased by 23.7 percent compared to 20.8 percent among the Scheduled Castes and 17.7 percent among the general population in the 2001-2011 decade. Although largely rural in their population composition, the Scheduled tribes are increasing at a much faster rate in the urban areas than other segments of the population. They registered 49.7 percent increase in their urban population during the decade preceding 2011 which is far more than the Scheduled Castes and the general population. As per 2011 Census, 11.3 percent of India's rural population consisted of the Scheduled tribes as against only 2.8 percent of the urban population. The recent rise in the urban Scheduled Tribe population is indicative of an increased pace of rural to urban migration among these communities who continue as largely rural in their composition. Of the total tribal population, 11 percent lived in urban areas in 2011 compared to only 7 percent in 2001.

Table 4.3: India: Scheduled Caste Population, 2011

State/UTs	% STs in State Population	% ST to Total ST of India
Andhra Pradesh	5.3	2.5
Arunachal Pradesh	68.8	0.9
Assam	12.4	3.7
Bihar	1.3	1.3
Chhattisgarh	30.6	7.5
Goa	10.2	0.1
Gujarat	14.8	8.5
Haryana	0.0	0.0
Himachal Pradesh	5.7	0.4
Jammu & Kashmir	11.9	1.4
Jharkhand	26.2	8.3
Karnataka	7.0	4.1
Kerala	1.5	0.5
Madhya Pradesh	21.1	14.7
Maharashtra	9.4	10.1
Manipur	40.9	1.1
Meghalaya	86.1	2.4
Mizoram	94.4	1.0
Nagaland	86.1	2.4
Odisha	22.8	9.2
Punjab	0.0	0.0
Rajasthan	13.5	8.8
Sikkim	33.8	0.2
Tamil Nadu	1.1	0.8
Tripura	31.8	1.1
Uttar Pradesh	0.6	1.1

Uttarakhand	2.9	0.3
West Bengal	5.8	5.1
Union Territories		
A & N Islands	7.5	Negligible
Chandigarh	0.0	0.0
D & N Haveli	52.0	0.2
Daman & Diu	6.3	Negligible
NCT of Delhi	0.0	0.0
Lakshadweep	94.8	0.1
Puducherry	0.0	0.0

(Source: Census of India, 2011, Office of the Registrar General, India)

The spatial distribution of the scheduled Tribe population is marked by great degree of clustering and concentration. This unevenness in the spatial distribution has resulted in large variation in the ethnic composition of India's population in different areas of the country. At a broad level, the Scheduled Tribes display a much higher level of concentration in the population of the areas characterized by rugged topography in contrast to the areas with open relief where their share in the population is low to negligible or in certain cases completely absent. This is evident from the distribution of the Scheduled Tribes in different states and union territories of India (see table-3). For example, the scheduled tribes constitute a very high share of the population in the Northeastern states including Mizoram, Nagaland, Meghalaya and Arunachal Pradesh- all of which are mountainous and plateau in their relief. The Tribes account for an overwhelming 85-95 percent of the total population of these states. The population of Arunachal Pradesh in this region consists of over 68 percent Scheduled Tribes. The dominance of this segment of population however is much reduced in population of Manipur and Tripura where they account for 40.9 and 31.8 percent respectively. About one third of Sikkim's population too is tribal. The Brahmaputra valley largely represented by Assam however has less concentration of the Scheduled tribes accounting for only 12.4 percent of the state's total population. With some exceptions, the North Eastern region displays an ethnic composition of the population largely reflecting a tribal ethos unlike the rest of the country. With over 96 percent of the population consisting of the Scheduled Tribes, the Lakshadweep Island is predominantly tribal in its population composition. Another Union territory where a majority of its population consists of the Scheduled Tribes is Dadra and Nagar Haveli.

The Scheduled Tribes however constitute a small proportion of the population in Uttarakhand and Himachal Pradesh despite characterized by rugged topography associated with the Himalayan terrain.

Although the concentration of tribes is not as high as it is in the North east, they constitute a sizeable component of the population in the mid-Indian region of India consisting of Chhattisgarh, Odisha, Jharkhand, Madhya Pradesh, Gujarat, Maharashtra, Rajasthan and Goa where their population varies between 9 and 32 percent of the total population. This region emerges as a second pocket where the ethnic composition of the population has a large presence of the Scheduled Tribe component. Of these, Chhattisgarh, Odisha, Jharkhand and Madhya Pradesh have a high share of Scheduled Tribe population ranging from one third to one fifth of the population of these

states. The northern union territories of Jammu and Kashmir and Ladakh too have a significant proportion of the Scheduled tribes.

On the other hand the tribes constitute a small or even negligible proportion of the population of the states located in areas of open relief, the river valleys and plains with rich agricultural base. The ethnic composition of the population in these areas is characterized by a negligible influence of the tribal component. For example, the Scheduled Tribes are conspicuous by their absence in the population of Punjab, Haryana, Chandigarh and Delhi in the North and Pondicherry in the South. Moreover, Scheduled Tribes account for a negligible share of the population of Uttar Pradesh (0.6%), and an insignificant component of the population of Bihar (1.3%) and West Bengal (5.8%), all located in the Indo-Gangetic plain.

The Scheduled Tribes are far less in the population composition of the states located in the southern plateau region. With the exception of Karnataka where the Scheduled tribes constitute 7 percent of the state's population, their proportion falls below 5 percent in the remaining states in the region. Their proportion is as low as under 2 percent in Tamil Nadu and Kerala.

Regardless of their share in the total population in the total population in different states and union territories of India, it is interesting to note that bulk of the tribal population is concentrated in just 6 major states of India located in the mid Indian region accounting for nearly 60 percent of the total Scheduled Tribe population of the country (Table-3). These states are Rajasthan (8.8%), Gujarat (8.5%), Maharashtra (10.1%), Madhya Pradesh (14.7%), Chhattisgarh (7.5%) and Odisha (9.2%). In contrast, the states in the North Eastern region together support only 12.6 percent of all the Scheduled Tribes of India. It is evident that the numerical strength of the Scheduled Tribes is rather small in the North East where they constitute majority or highly important component in the total population. On the other hand, the Scheduled Tribes do not constitute majority in the population composition of the states located in the mid-Indian region, but their numerical strength is much larger. This is due to extreme clustering of the Scheduled Tribe population in the mid-Indian region in some pockets revealed from their share in the total population at district level. In many districts located in this region and elsewhere, they are a dominant category regardless of their share in the total pupation of the respective states. For example certain districts in Jharkhand, Odisha, Madhya Pradesh, Chhatisgarh, Gujarat and Himachal Pradesh as well as in Union Territories of Dadra and Nagar Haveli and in Andaman and Nicobar Islands, the Scheduled tribe constitute over half of the population of these districts.

An important dimension of the composition of the Tribal population in the country relates to an inverse relationship between the Scheduled Tribes and the Scheduled Castes, displaying a clear spatial dichotomy in their spatial distribution. This mutual exclusivity in the concentration pattern of the two ethnic categories, according to A Ahmad, is an important attribute reflecting their past association with two different modes of the economy practiced by them. The spatial pattern in the distribution of the Scheduled Tribe population is by and large negatively correlated with Muslims but positively associated with the Christian population.

SAQ 2

- a) According to 2011 Census, name the two states of India where Scheduled Tribe population were not found.
- b) What does mutual exclusivity in the concentration pattern of the two ethnic categories reflect?

4.4 LITERACY AND LEVELS OF EDUCATIONAL ATTAINMENTS

Spread of literacy and education is generally considered as a measure of social and economic progress with its powerful influence on many demographic parameters including growth, fertility, mortality and migration etc. Literacy composition of the population therefore constitutes an important aspect of population composition.

4.4.1 Concept

Undoubtedly the level of literacy and education is very important quality of a population. Education has been widely recognized as an essential prerequisite for progress and development of an individual, population, community or nation. Besides, literacy and education affect and often influence several other demographic behaviours including fertility, mortality, migration, and economic composition of the population while being itself influenced by the levels of socio-economic development as well as religious and ethnic composition of a population.

Commonly defined as the 'ability to read and write a simple message in any language', the term literacy has been used to include counting skills too. According to UNESCO, literacy is "now understood as a means of identification, understanding, interpretation, creation, and communication in an increasingly digital, text-mediated, information-rich and fast-changing world". The concept of literacy however varies across countries depending on their socio cultural context, levels of development and exposure to modern, formal institutions of learning. Due to extreme diversity in defining literacy and education, and for the purpose of comparison, minimum level of literacy skills is often considered as a satisfactory basis. While some countries insist on a minimum length of schooling as a prerequisite for distinguishing a literate person from an illiterate, it has found few takers particularly in those countries which have a more recent history of exposure to mass literacy. The population Commission of the United Nations therefore accepts 'ability to both read and write a simple message with understanding in any language' as a sufficient basis for classifying a person as literate.

With each and every country making strenuous efforts to promote literacy to its population, the literate component of the population is constantly rising. Despite this in the year 2021 there are still 773 million youth and adults according to UNESCO, who cannot read and write and nearly two thirds of

them are women. Significantly there are 250 million children who have failed to acquire basic literacy skills.

The world has nevertheless changed from a largely illiterate society to consisting of majority of literates in most countries in the last few decades- a process which is known as literacy transition. According to RC Chandna, this transition from largely illiterate population to higher literacy rates among the people began in the industrial nations of Western Europe to diffuse to other parts of the world. The countries of the world can be placed at different categories of this literacy transition depending upon the degree of success achieved by them in attaining literacy and education. There are nations which have achieved full literacy for all its population and have thus completed the transition. In the second category are included countries which are in the midst of the transition registering substantial increase in the literate component of their population. There are also some other countries, though far fewer in number, where the population largely consists of the illiterates and where the transition is yet to take off. The countries which have completely eliminated illiteracy include both the old and new industrialized countries in North America, countries in Europe; Japan, Australia, New Zealand and Argentina. The countries where the transition is underway include those where exposure to mass literacy is of more recent origin, more specifically a post World War phenomenon. These countries are characterized by ethnally diverse large populations and had a colonial past. They are mostly agricultural with industrialization and urbanization taking place at a slow pace. Prominent in this category of transition are countries like China, India, Pakistan, Bangladesh, Indonesia, Brazil, Mexico, Iran etc. The countries where the population largely consists of the illiterates and the transition is at its initial stage include most African nations and the Islamic world of the West Asia. In the latter, the extent of female illiteracy is exceedingly high which has been a major factor in the low overall literacy rate achieved by these countries.

Due to the differential pace of the literacy transition, there is glaring inter-country disparity in attainment of literacy. The intra-national differences in literacy rate in less developed countries with moderate or low level of literacy too is equally staggering due to wide differences in literacy rates observed among diverse population sub-groups such as between the males and females, between rural and urban areas and across ethnic groups. In countries that have not achieved full literacy status, it is common to notice lower literacy rates among the females and those residing in rural areas.

4.4.2 Determinants

Factors affecting literacy are many and complex. However the important factors determining the levels of literacy can be classified under the following heads: historical, economic, degree of urbanization, Socio-cultural and government policies.

The countries and regions which came under colonial rule generally display lower level of literacy owing to the fact that the colonial powers were rarely interested in the social development of the countries held by them as colonies. Likewise areas under prolonged feudal rule are characterized by lower literacy rates. In contrast, countries and regions which experienced

early industrialization benefited from investing in literacy and education for skill development was essential for industrialization. In contrast, the need for literacy and formal education was not a felt need in traditional, dominantly agricultural economies limiting the scope of literacy development in such countries. Urbanization is often cited as a powerful force influencing literacy. One of the most powerful determinants of literacy is whether one lives in an urban or rural environment. The rural urban disparity in literacy rates tend to be greater in countries with poor overall literacy rate. Higher rate of literacy in urban areas are largely due to better access to formal schooling and concentration of varied educational institutions.

Socio-cultural factors play a significant role as determinants of literacy. Religion, Language, gender discrimination etc. is but a few important social and cultural factors which have played important role in the past and in the present in differentiating responses to literacy development world over. Although there are striking differences in the literacy attainment levels among the people belonging to diverse faiths, gaps in educational attainment are partly a function of where religious groups are concentrated throughout the world- whether they are concentrated in developed or developing regions of the world. Moreover, important differences in educational attainment are seen among religious groups living in the same region, and even the same country. The medium of instruction in a language other than the mother tongue has been widely found to be a constraining factor in literacy development. Patriarchal values discriminating women and a lower status assigned to them too impede their access to literacy and education. Restrictions imposed on women's mobility and prejudices against female education in some societies makes acquiring of literacy skills it purely a male prerogative and brings down the literacy rates to a great extent.

Differences in standard of living, improvement in transport and communication are other factors which are often found to be important determinants of literacy.

One of the most important determinants in spread of literacy has been and continues to be the policies and programmes adopted by the Governments of respective countries. Policies like right to education, free and compulsory education, adult literacy programmes, provision of schools within a short distance, mid-day meals schemes etc. have played a positive role in improving literacy rates wherever practiced.

4.4.3 Spatial Patterns with Special Reference to India

At the time of its Independence, only a small proportion of the population was literate. The 1951 Census enumerated only 18.33 percent of the population who were able to read and write. The male female disparity in literate rate was staggering with only 8.86 percent female literacy rate as against 27.16 percent males who were literate. The literacy gap between the two sexes was a staggering 18.30 percent. The proportion of literate population in the country has substantially improved since then, but the male female gap in literacy attainment has seen an upward trend indicating that literacy development among the female segment is lagging behind their male counterparts. In 2001, the overall literacy stood at 65.38 percent with a literacy gap of 21.69

percent between the males and females. The gap however has declined to 16.68 percent in 2011 revealing faster growth in female literacy rate in the first decade of the present century.

The overall literacy rate of India however has shown remarkable increase as evident from the fact that over 74 percent of the country's population is literate as per 2011 census. The male literacy rate is much higher at 82.14 percent compared to females who still lag behind with a literacy rate of 65.46 percent. The rural urban disparity in literacy composition is equally glaring. While 84.11 percent of the urban population is literate, the rural population lags behind with 67.77 percent literates among them.

The aggregate literacy composition of the population of India however conceals significant variation at lower aggregate levels, such as among the states and union territories or across different geographic regions.

Table 4.4: India: % Literate Population, 2011.

State/UTs	Total	Male	Female	Male-Female gap	% Change from 2001
Kerala	94.00	96.11	92.07	4.04	3.14
Lakshadweep	91.85	95.56	87.95	7.61	5.19
Mizoram	91.33	93.35	89.27	4.08	2.53
Goa	88.70	92.65	84.66	7.99	6.69
Tripura	87.22	91.53	82.73	8.80	14.03
Daman and Diu	87.10	91.54	79.55	11.99	8.92
Andaman and Nicobar Islands	86.63	90.27	82.43	7.84	5.33
Delhi	86.21	90.94	80.76	10.18	4.54
Chandigarh	86.05	89.99	81.19	8.80	4.11
Puducherry	85.85	91.26	80.67	10.59	4.61
Himachal Pradesh	82.80	89.53	75.93	13.60	6.32
Maharashtra	82.34	88.38	75.87	12.51	5.46
Sikkim	81.42	86.55	75.61	10.94	12.61
Tamil Nadu	80.09	86.77	73.44	13.33	6.64
Nagaland	79.55	82.75	76.11	6.64	12.96
Uttarakhand	78.82	87.40	70.01	17.39	7.2
Gujarat	78.03	85.75	69.68	16.07	8.89
Manipur	76.94	83.58	70.26	13.32	10.33
West Bengal	76.26	81.69	70.54	11.15	7.62
Dadra and Nagar Haveli	76.24	85.17	64.32	20.85	18.61
Punjab	75.84	80.44	70.73	9.71	6.19
Haryana	75.55	84.06	65.94	18.12	7.64
Karnataka	75.36	82.47	68.08	14.39	8.72
Meghalaya	74.43	75.95	72.89	3.06	11.87
Orissa	72.87	81.59	64.01	17.58	9.79
Assam	72.19	77.85	66.27	11.58	8.94
Chhattisgarh	70.28	80.27	60.24	20.03	5.62
Madhya Pradesh	69.32	78.73	59.24	19.49	5.58
Uttar Pradesh	67.68	77.28	57.18	20.10	11.41
Jammu and Kashmir	67.16	76.75	56.43	20.32	11.64
Andhra Pradesh	67.02	74.88	59.15	15.75	6.55
Jharkhand	66.41	76.84	55.42	21.42	12.85

Rajasthan	66.11	79.19	52.12	27.07	5.7
Arunachal Pradesh	65.38	72.55	57.70	14.85	11.04
Bihar	61.80	71.20	51.50	19.70	14.8

(Source: Census of India, 2011, Office of the Registrar General, India)

The level of literacy achieved by the different states and union territories of India as revealed from 2011 census reveals remarkable spatial disparity (Table 4). This is evident from the fact that the level of literacy ranges from low of 61.80 percent in Bihar to a high of 94 percent in Kerala. Only three state/union territories of India in the year 2011 namely Kerala, Lakshadweep and Mizoram located far away from each other have over 90 percent literate in their population and are declared fully literate.

In a large number of states distributed in diverse geographic regions, the share of the literate population is high constituting 80 to 90 percent of the population. These states include Maharashtra and Goa in the West to Tripura and Sikkim in the North East; Himachal in the North and Tamilnadu in the South. The Union territories of Delhi and Chandigarh in the North; Daman and Diu in the West, Puducherry in the South and the island territory of the Andaman Nicobar Island too are included in this category of High literacy level. The fact that the states and union territories with very high or high share of literate population are widely dispersed over diverse geographic regions of the country, points to the operation of complex factors responsible for high literacy levels in these states/union territories.

States and union territories with 70 to 80 percent literate population represent moderate level of literacy attainment. They are also geographically diverse and include most states in the Northeast; West Bengal, Odisha and Chhatisgarh in the East; Uttarakhand, Punjab and Haryana in the North, Gujarat and the union territory of Dadra and Nagar Haveli in the West; and Karnataka in the South.

The proportion of the illiterate segment in the population is relatively high in a few but large states namely Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar and Jharkhand forming a contiguous belt of low literacy. The North eastern state of Arunachal Pradesh, the northern union territories of Jammu and Kashmir and the southern state of Andhra Pradesh (including Telangana) constitute outliers to this belt. The proportion of literates in these states ranges between 60-70 percent.

The spatial pattern in the level of literacy in 2011 reveals that the states and union territories with higher literacy rates are non-contiguous, but majority of the states in the category of lowest literacy levels are more contiguous and confined to the northern region of the country. A cursory glance of Table 4 reveals a striking correspondence between lower literacy level and wider male female disparity in the attainment of literacy. Thus, high level of illiteracy in can easily be attributed to low level of literacy among the women in these states. Another interesting fact relates to faster increase in the literate share in the population of many states with lower literacy level in the preceding decade holding promise of greater convergence in the spatial pattern of literacy in near future

SAQ 3

- a) Define literacy given by UNESCO.
- b) Name any three factors that determine the levels of literacy.
-

4.5 SUMMARY

In this unit you have studied:

- The socio-cultural composition of the population of India is complex and varied and is a result of various historical, economic and demographic forces differentiated by geography as revealed from its distinct regional manifestation. The different components of this composition as described in this unit are not to be treated separately; they are indeed inter-related and intertwined in the regional structure of the country. The social and cultural composition, like many other demographic characteristics, is extremely dynamic and hence represents a pattern that gets modified over time and space.
- About 85 percent of world's population identify with one or the other religions. The remaining 15 percent is unaffiliated to any religion. Major religions with which people identify themselves are Christianity, Islam, Hinduism, Buddhism, folk religions, Judaism, the unaffiliated and the other minor religions. The Muslim population which accounts for 14.23 percent of the population in 2011 constitutes the largest religious minority followed by the Christians who account for 2.3 percent of the total population. The Sikhs account for 1.72 percent of the population of India followed by the Buddhists (0.70%) and the Jains (0.37%).
- Accounting for 16.64 percent the scheduled castes in 2011 constituted a significant proportion of India's population. The inter-state comparison of the proportion of the scheduled caste in the total population of these states and union territories reveal striking contrasts. The Scheduled Caste population constitutes nearly a third (31.94%) of Punjab's population. Their concentration in the total population varies between 20-25 percent in Himachal Pradesh, West Bengal, Uttar Pradesh, Haryana and Tamilnadu.
- Due to their social and economic backwardness, article 366 (25) of the Indian Constitution defines them as Scheduled Tribes. The proportion of the Scheduled tribes in country's total population is steadily increasing over the years. They constituted 7.83 percent of the country's population in 1981 which increased to 7.95 percent in 1991, 8.2 percent in 2001 and 8.6 percent in 2011- registering an increase of nearly one percent in their share.
- Literacy is commonly defined as the 'ability to read and write a simple message in any language', the term literacy has been used to include counting skills too. The level of literacy achieved by the different states and union territories of India as revealed from 2011 census reveals remarkable spatial disparity. This is evident from the fact that the level of literacy ranges from low of 61.80 percent in Bihar to a high of 94 percent in Kerala. Only three state/union territories of India in the year 2011 namely Kerala, Lakshadweep and Mizoram located far away from each other have over 90 percent literate in their population and are declared fully literate.

4.6 TERMINAL QUESTIONS

1. Describe spatial patterns of religious composition of India's population
2. Explain demography and spatial distribution of the Scheduled Castes of India.
3. Analyse demography and spatial distribution of the Scheduled Tribes of India.
4. Discuss concept and determinants of literacy.

4.7 ANSWERS

Self Assessment Questions (SAQ)

1. a) The folk religion refers to traditional African religions and Chinese folk religions, and both Native American and Australian aboriginal religions.
b) Jains, Buddhists, Muslims and Christians
2. a) Punjab and Haryana
b) It reflects their past association with two different modes of the economy practiced by them.
3. a) According to UNESCO, literacy is "now understood as a means of identification, understanding, interpretation, creation, and communication in an increasingly digital, text-mediated, information-rich and fast-changing world"
b) Historical, economic, degree of urbanization, Socio-cultural and government policies.

Terminal Questions

1. Refer to Section 4.2.
2. Refer to Section 4.3.1
3. Refer to Section 4.3.2
4. Refer to Section 4.4.

4.8 REFERENCES AND FURTHER READING

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