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BGGCT-132
HUMAN GEOGRAPHY

Block

3

POPULATION

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BLOCK 3: POPULATION

Till now you have studied nature and scope of Human Geography, concepts in Human Geography, perspectives on human-environment relationship and human adaptation to the environment in Block-1. You have also studied peopling and racial elements, religion and believes, languages and cultural regions under Block 2 titled Space and Society. In this Block we will study various aspects related to population under four units.

Unit 9 Population Distribution and Growth: In this unit an attempt has been made to present spatio-temporal analysis of population distribution and growth and their associated factors. In the last section, a brief discussion has been made on two important theories related to population growth namely Malthusian Theory and Demographic Transition Theory.

Unit 10 Population Characteristics: As the title of the unit suggests, we will discuss various characteristics by analysing population composition. This unit highlights issues like declining sex ratio and particularly child sex ratio, ageing, demographic dividend, skill formation etc.

Unit 11 Human Migration: The initial section of the unit define migration and differentiating it from other forms of mobility. This unit has also discussed various types of migration and their basis. The next two sections discussed about determinants and consequences of migration. In the last section, spatial patterns of international migration is analysed.

Unit 12 Population and Resources: The focus of the unit is to analyse population resource relationship and the consequences emerging out of population-resource interaction. Therefore, the unit discussed concept of under population, over population and optimum population. The concluding section justify the need for sustainability and sustainable development.

We hope after studying this block, you will acquire an in-depth understanding about various concepts, issues and concerns related to population.

Our best wishes are with you in this endeavour.

UNIT 9

POPULATION DISTRIBUTION AND GROWTH

Structure

9.1 Introduction
Expected Learning Outcomes

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9.3 Growth of Population
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9.1 INTRODUCTION

We all have more or less some ideas and experiences about population. Sometimes we analyze or discuss among ourselves various issues related to population like rising numbers, crowding and congestions, female foeticides, declining sex ratio etc. We also try to analyse various consequences arising out of over population and growing numbers. You have also read about some of the issues in the subject of social sciences in different classes during your school days. You may have seen a population map of the world where some countries have more population than others. You might also be wondering why urban areas tend to have high population density. These issues related to population drew the attention of geographers when Population Geography emerged as a sub-discipline within Human Geography.

In this unit, an attempt has been made to acquaint the learner with spatial and temporal analysis of distribution and growth of population. In the last section of the unit, a brief discussion has been made on two important theories related to population growth namely Malthusian Theory and Demographic Transition Theory.

Expected Learning Outcomes

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

- describe the distribution and growth of world population over the time and space;
- analyse various factors responsible for uneven distribution and growth; and
- evaluate theories and models related to population growth and its significance.

9.2 DISTRIBUTION OF WORLD POPULATION

Population is unevenly spread all over the world. You might have also observed this in your locality. Some places have low concentration of population whereas some areas have high concentration of population. This is known as distribution of population. Do you know how do we measure this distribution? Density is one of the widely used measurement tool for analysing the distribution of population. In this section we will discuss about distribution and density of population in the world.

9.2.1 Distribution of Population Size

Have you ever thought about the reasons responsible for such uneven distribution of population in your area? Let us discuss some examples of uneven distribution of population by size or number of person in the world so that you can think about the same phenomena at the local level. In the world low concentration of population are found in deserts, dense forests, mountainous areas etc. Similarly, there are many areas like coastal and deltaic plain areas having moderate climate and fertile soil, industrialised regions, urban centers etc have high concentration of population size. Why is it so?

In simpler term, this spread of population is known as distribution of population. In other words, it refers to the geographic pattern of location of a population. What are the various factors responsible for this uneven distribution? Think about the examples you have studied so far. Try writing down the reasons/factors responsible for uneven distribution. So you would have noted that a variety of factors can cause uneven distribution. These factors can vary from area to area.

If we look at the factors responsible for the distribution of population, then all the factors may be broadly grouped under two categories: (i) **Physical factors** and (ii) **Socio-economic factors. Physical factors** include latitude and altitude, relief, climate, soil, mineral & energy resources whereas s**ocio-economic factors** include industrialisation, urbanisation, type of economy, political decision and public policies.

We have made this categorisation for our own understanding. In reality, population concentration in a particular place is determined by combinations of various physical and socio-economic factors. Therefore, it is very difficult to isolate major influence of any one factor on population distribution. Simultaneously, it is equally difficult to explain the complex interplay between various factors responsible for uneven distribution of population. As stated by Clark, our primary role as geographer is to explain this uneven distribution in terms of the influences of all the factors as an integral part of dynamic process (Clark, 1972:14).

Factors Responsible for Uneven Distribution of Population

Let us discuss both physical and socio-economic factors briefly.

A) Physical Factors: Major physical factors that are responsible for uneven distribution of population are landforms, climate and soil.

i) **Landforms:** People mostly prefer living on plain areas having gentle slopes. This is because such areas are favourable for agricultural activities, construction of roads and establishment of industries. On the other hand, the mountainous and hilly areas hinder the development of transport network and majority of land are unfavourable for agriculture and industrial development. Therefore, these areas tend to be less populated. Till now you might have realised that this is the reason for which the Ganga plains in India is one of the most densely populated areas of the world whereas the mountainous areas of the Himalayas are scarcely populated. Try to find out similar type of areas in other parts of the world and write it down in the side margin.

ii) **Climate:** An extreme climate such as very hot or cold is uncomfortable for human habitation. Areas with a moderate climate, where there is not much seasonal variation attract more people. Areas with very heavy rainfall or extreme and harsh climates have low population. Mediterranean regions were inhabited from early periods in history due to their pleasant climate. But it is very difficult to identify the bench mark for moderate climate. However, there are many exceptions. For example Java Island in Indonesia located on the equator and having hot and humid conditions is one of the densely populated areas in the world.

iii) **Soils:** Fertile soils are important for agricultural and allied activities. Therefore, areas having fertile soils have more people because these soil can support intensive agriculture. Can you name some areas in India which are thinly and thickly populated due to poor and good quality soil respectively?

B) Socio-Economic Factors: Major socio-economic factors that acts as determinants for uneven distribution of population are availability of mineral resources, industrialisation, urbanisation, socio-cultural significance and political decision. Let us discuss them one by one.

i) **Availability of Mineral Resources:** Areas with rich mineral deposits attract industries. Mining activities generate employment. So, skilled and semi–skilled workers move to these areas and make them densely populated. That is the reason for which mineral rich areas of Jharkhand, Chhattisgarh and Odisha has more population which used to be sparsely populated areas before the large scale mining activities were initiated.

ii) **Industrialisation:** Industries provide job opportunities and attract large numbers of people. These include not just factory workers but also transport operators, shopkeepers, bank employees, doctors, teachers and other service providers. The Kobe-Osaka region of Japan is thickly populated because of the presence of a number of industries. Can you think of similar type of industrial belt in India?

iii) **Urbanisation:** Cities offer better employment opportunities, educational and medical facilities, better means of transport and communication. Better civic amenities and the quality of life attract people to the cities. It leads to rural to urban migration. This is a very common phenomena in most of the developing countries including India. Mega cities of the world continue to attract large number of migrants every year.

iv) **Political Decisions:** Many times governments offer incentives to people to live in sparsely populated areas or move away from overcrowded places. Can you think of some examples from your region? Let us discuss some of the examples. The then communist ruled USSR took a decision to shift people from densely populated areas namely Moscow-Leningrad region to Siberian region. Similarly, Chinese government has also made an attempt to decongest coastal region by shifting people to interior parts of the country.

World Patterns of Distribution of Population

The unevenness of population distribution can be analysed by different criteria. The unevenness in distribution of population is evident from the fact that about 80% of the population resides in less than 20% of the land surface. This would be much clearer when we look at distribution in relation to various factors or bases. Some of the bases are as follows:

i) **On the Basis of Habitability**: The ancient Greeks used the terms ecumene and nonecumene to differentiate between habited parts of the world from what they believe as uninhabited parts of the world. Examples of such nonecumene areas as perceived by Greeks are tropical rain forest, high mountainous areas, permanent ice covered Polar and Tundra region and mid latitude deserts. It has been estimated that roughly 60% areas on the earth surface is categorised as ecumene and rest of the area is termed as nonecumene.

But, this classification has limitations. First, the distinction between ecumene and nonecumene is not sharp. There has been a gradual change of concentration of population from highly populated areas to sparsely populated and areas which where not in habited back in time or where environmentally not suitable for human habitation. Therefore, there is always a transition zone between these two extremes. Secondly, the nonecumene contains highly populated nodes or clusters such as oases, mining camps and small communities.

ii) **On the Basis of Hemisphere:** If we look at distribution of population in terms of hemisphere, about 90% of population is located in the northern hemisphere and about 10% is located in the southern hemisphere. The major factor for such contrasting distribution pattern is due to distribution of land surface. If you closely observe world political map then you will find northern hemisphere contains majority of land mass whereas southern hemisphere is dominated by water bodies.

iii) **On the Basis of Old and New World:** Similar kind of contrast is also observed if we compare the distribution in terms of Old World and New World. Do you know what the meaning of Old World and New World is? The **Old World** consists of Africa, Europe, and Asia, regarded collectively as the part of the world known to Europeans, Africans and Asians before European contact with the Americas. It is used in the context of, and contrast with, the **New World** consisting of North and South America and Oceania. Again it has been found that about 85% of the population resides in the Old World whereas rest of the population (about 15%) resides in the New World.

iv) **On the Basis of Scale of Concentration:** Another way of looking at the distribution is in terms of scale of concentration. In terms of concentration, there are certain areas classified as primary, secondary and tertiary concentration.

a) **Primary Concentration:** There are three areas classified as primary concentration. These three areas are (i) South and South-East Asia, (ii) North and North Western parts of Europe, and (iii) East-Central Parts of North America. These three clusters accounts for about seventy percent of the world's population. Let us discuss about them in detail:

Within **South and South-East Asia** region, South Asia is one of the major concentration which accounts for about half of the world's population. This region has world's two most populous countries of the world-India and China which contains about 35% of the world population. The other region is located in the eastern parts of Asia that adjoins the Pacific Ocean and penetrates towards the interior along the river basins. If you observe the

region closely, you will find that majority of the population are located along the coast and river valleys. In this region maximum population are also found in the rural areas.

Unlike South and South-East Asia, **North Western parts of Europe** are basically the areas traditionally located around the coalfields. These are the areas around which industrial revolution started in the seventeenth century. Therefore, these are predominantly urban areas.

Try to find out the reasons for high concentration in the East-Central Parts of North America and write it in the margin.

b) **Secondary Concentration:** Secondary concentrations are those areas where spread of concentration in terms of extent is less than primary concentration. Examples of secondary concentration are California in USA, eastern Brazil, the river Plate lowlands, the Nile Valley, western and southern parts of Africa and the south eastern parts of Australia. This concentration roughly covers 5-10% of the world population.

c) **Tertiary Concentration:** These are numerous small pockets of concentration scattered all over the world in terms of knots or strings. Examples of such concentrations are High Basins of Mexico, the Nile Valley etc.

v) **On the Basis of Continents and Countries**: In terms of continents, Asia has the largest share of population (about 60 per cent) followed by Africa, Latin America and Europe. The unevenness in the distribution of population is also prominent within the continents and countries. As discussed earlier, within Asia, South and South East Asia are more populous than North and West Asia. Similarly, in Europe, the North Western Europe exhibits a greater concentration than the rest of the continent. In North America major concentration is found in the eastern parts of the continent along the Atlantic coast. In Australia, major concentration of population is found in the five major cities - Sydney, Melbourne, Adelaide, Perth and Brisbane located along the coast.

According to Population Reference Bureau, World Population Data Sheet, in 2050 Asia will have largest share of population but it would decline from about 60 per cent to 57 per cent. But the major increase of population would take place in Africa i.e. 12.7 per cent to 22.4 per cent and major decline in population would take place in Europe i.e. 7.2 per cent to 4.1 per cent. As world population has risen from 2.5 billion in 1950 to 6.7 billion in 2008, the proportion living in the developing countries of Africa, Asia, and Latin America and the Caribbean has expanded from 68 per cent to more than 80 per cent. India and China, with a billion-plus each make up about 37 per cent of the total. Projections for 2050 show this shift to developing countries

continuing. The share of living in the more developed countries is projected to drop from about 18 percent in 2008 to less than 14 per cent in 2050.

9.2.2 Density of Population

Density is one way of expressing distribution. Density of population is expressed as number of persons per square kilometer. This is popularly known as **arithmetic density**. This is one of the simplest and widely used methods for showing man-land ratio. However, it can not be used for various specific planning purposes. Therefore, various types of densities are calculated for specific purposes. Some examples are agricultural density, nutritional density, room density etc. Let us discuss very briefly about them.

Nutritional or Physiological Density is the ratio between the total population and total cultivated area of a particular place. This is expressed as person per square kilometer of cultivated land.

Agricultural density is expressed in terms of agricultural population per unit of cultivated area.

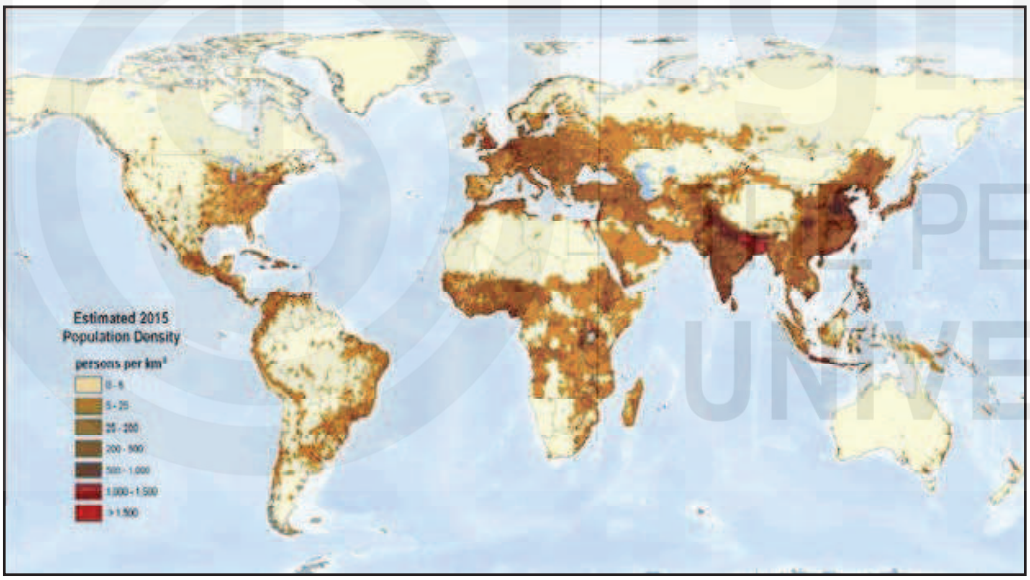


Fig. 9.1: World Patterns of Population Density.

If we analyse world density patterns it has been observed that small Asian countries namely the Chinese territory of Maccau has the world's highest population density i.e. 21,081 person per sq.km. followed by Monaco (19,256) and city state of Singapore. On the other hand larger countries of the world have quite low population density. For example, Russia has 8 persons per sq.km. while Canada has 4 persons per sq.km. The United States of America has 35 persons per sq.km. which is more than Russia and Canada but less than China and India.

SAQ 1

a) Differentiate between ecumene and non-ecumene with examples.

b) Define the term nutritional and agricultural density.

9.3 GROWTH OF POPULATION

Growth of a place is determined by fertility, mortality and migration. Population growth may be expressed in various ways. Natural Growth is the simplest expression which is the difference between birth rate and death rate whereas actual growth takes migration in to consideration.

- **Natural Growth** = Fertility – Mortality
- **Actual Growth** = Fertility – Mortality + In Migration – Out Migration

The world population has been growing continuously since the end of the Black Death around 1400. There were also short term falls at other times due to plague, for example in the mid 17th century. The fastest rates of world population growth(above 1.8 per cent) were seen briefly during the 1950s then for a longer period during the 1960s and 1970s. According to population projections, world population will continue to grow until around 2050. The rate of growth has almost halved (less than 1.1 per cent per year during 2015-20) since its peak of 2.1 per cent per year during 1965-70, which was reached in 1963. World births have leveled off at about 137-million-per-year, since their peak at 163-million in the late 1990s, and are expected to remain constant. However, deaths are only around 56 million per year, and are expected to increase to 90 million by the year 2050. Since births outnumber deaths, the world's population is expected to reachabout 9 billion by the year 2040. The alarming fact is that we have been adding one billion populations in 12 years interval. If we look at the demographic history, it is evident that the world took about 170 years (1804-1975) to add three billion populations whereas the next three billion populations was added in the next 37 years (1975-2012) (Table 9.1).

Table 9.1: World: Growth of Population

Year	Population (Million)	No. of years to Add 1 Billion People
1804	1000 (1 Billion)	1804
1927	200 (2 Billion)	123
1960	300 (3 Billion)	33
1975	400 (4 Billion)	15
1987	500 (5 Billion)	12
1999	600 (6 Billion)	12
2012	700 (7 Billion)	13
2025	800 (8 Billion)	13
2040	900 (9 Billion)	15

If we plot these populations in Y axis and year in X axis then it has been found that growth of human population exhibits a J-shaped curve (Fig. 9.2). As you have noticed from the data given in the table, in J-shaped population growth form indicates the population grows exponentially or logarithmic form and after attaining the peak value, the population will start declining.

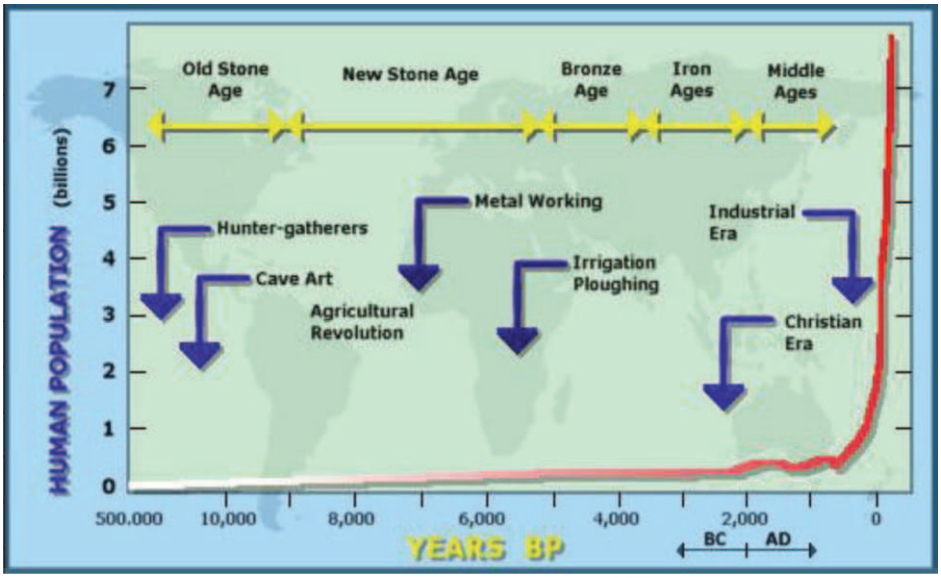


Fig. 9.2: J-shaped Growth Curve of Human population.

If we analyse critically history of growth of population, it is observed that there are three distinct phase in which there were sudden acceleration in growth of world population. These three distinct periods are (i) around 8000 BC, (ii) 1750 AD and (iii) since 1950. Do you know why? The period around 8000 BC, human being learnt the art of domestication of plant and animal. As a result of which human being started settled life and became food grower rather than being hunter or food gatherer. The year 1750 AD was significant because it is marked with agricultural revolution followed by industrial revolution in Europe. The middle of twentieth century is significant because of the reduction of death rates in the developing countries of the world due to availability of better health care facilities.

9.3.1 Growth Differentials

Like distribution, growth of population is also reported uneven pace over different regions and countries.

If we look at growth pattern in terms of developed and developing countries, till 1950, the growth rate in developed world was high in comparison to developing countries. This was due to decline in mortality and the widening gap between birth rate and death rate. The decline in mortality was due to various factors like increase in literacy, advancement in medical sciences and health facilities etc. But in developing countries, the growth rate was low because both birth rate and death rate was very high that helps in reducing growth rate. After 1950, the growth rate in developed world was very low in comparison to developing countries. This was because of remarkable decline in birth rate and death rate in developed countries, whereas in developing world, particularly in the countries with larger population base like China and India, there was a sharp decline in the death rate but birth rate remains high. In case of both the world, the population growth rate has witnessed a down ward trend during the last 30-40 years.

According to United Nations World Population Prospects 2019, the growth rate of population in the world was 1.08 per cent. If we look at the trends amongst various continents, it has been observed that Africa continued to display the highest growth rate of population of 2.52 per cent. Europe displayed a growth rate of only 0.1 per cent which is the lowest amongst the continent. If we look at other continents in terms of descending order then Africa is followed by Oceania (1.34 per cent), Asia (0.89 per cent), South America (0.85 per cent), North America (0.63 per cent) and Europe (0.1 per cent). Europe in contrast to Africa attained a zero population growth rate for the continent as a whole, where many countries have already recorded negative growth rate in their population. Both Asia and South America too have already record a significant decline in their growth rates. Most of the countries in these continent would be able to attain an average annual growth rate of about 1.4 which is considerably below the replacement level of 2.1 per cent that will help in the population stabilisation process in the near future. China, India, Brazil, Mexico were going to be the major contributors in the world's population stabilisation process in the near future. However, for a better demographic future for the world as a whole, sooner the countries of Africa and Islamic world fall in line with the large sized most populous countries of the less developed world.

SAQ 2

a) What does J-shaped growth of human population indicate?

b) Why was there a sharp difference in growth rate between developed and developing countries.

9.4 THEORIES OF POPULATION GROWTH

In this section we will discuss two important theories that explain about world population growth. These theories are Malthus theory and Demographic Transition Theory. Let us discuss these theories one by one.

9.4.1 Malthus Theory

Thomas Robert Malthus was the first economist to propose a systematic theory of population. In 1798, Malthus published *An Essay on the Principle of Population*, describing his theory related to growth of human populations. Between 1798 and 1826 Malthus published six editions of his famous treatise, updating each edition to incorporate new material, to address criticism, and to convey changes in his own perspectives on the subject.

Malthus regarded ideals of future improvement of humanity with skepticism, considering that throughout history a segment of every human population seemed relegated to poverty. He explained this phenomenon by pointing out that population growth generally preceded expansion of the population's resources, in particular the primary resource of food.

While developing his theory, Malthus proposed **two hypotheses**:

i) Food is necessary for the existence of human being; and

ii) the passion between the sexes is necessary and will remain nearly in its present state.

Based on these two hypotheses he asserted that:

i) The power of population is indefinitely greater than the power in the earth to produce subsistence for human being. Population, when unchecked, increases in a geometrical ratio whereas subsistence i.e. production of food substances increases only in an arithmetical ratio.

ii) In all societies, even those that are most vicious, the tendency to a virtuous attachment is so strong that there is a constant effort towards an increase of population. This effort constantly tends to subject the lower classes of the society to distress and to prevent any great permanent amelioration of their condition.

Do you know?

This seminal work of Malthus was in reaction to the optimism of his father and his father's associates, (notably Rousseau) regarding the future improvement of society.

Malthus argued that population was held within resource limits by two types of checks which he termed it as positive and preventive. ***Positive checks*** are those checks which raised the death rate whereas ***preventative checks*** were those which lowered the birth rate. The positive checks whereas included hunger, disease and war the preventative checks, included abortion, birth, postponement of marriage, and celibacy. In the second and subsequent editions, Malthus put more emphasis on moral restraint. By that he meant the postponement of marriage until people

could support a family, coupled with strict celibacy until that time. "He went so far as to claim that moral restraint on a wide scale was the best means–indeed, the only means–of easing the poverty of the lower classes." This plan appeared consistent with virtue, economic gain and social improvement.

Criticism

Malthus theory was severely criticised. Some of the major criticisms are as follows:

1. Malthus basic premise on passion between sexes has been questioned on the plea that the desire to have children can not be mixed with passion and desire for sex. The desire for sex is a biological instinct where as the desire to have children is a social instinct.

2. The validity of two ratios proposed by Malthus was also questioned on the basis of empirical evidences that population has rarely grown by geometric progression and similarly production of food rarely multiplied in arithmetic progression.

3. The time span of 25 years assumed by Malthus for doubling of population is also not seem to be any where near reality because it varies from country to country depending upon demographic situation of that particular country. For example, it took Mexico only 20 years to double the population whereas USA which is the adjoining country took 120 years for the same.

4. Malthus also seems to be swayed by the supremacy of positive checks like delayed marriage, moral restraints and controlled frequency of sex after marriage. It is rather strange that Malthus could not think of the use of contraceptives as an effective preventive check despite the fact that Malthus very much knew about it.

5. Malthus was severely criticised for ignoring the role of changing technology and changes in socio-economic set up of a society.

Reactions to Malthusian Theory

You might have realised till now that there were so many drawbacks in Malthus Theory. Therefore, it was obvious that his theory was severely criticised and counter arguments were proposed. In the following section we will discuss them under two broad heading: Neo-Malthusian and Marixist arguments.

Neo Malthusian Arguments: Neo-Malthusian are those who beliefs Malthus. In other words the neo-Malthusian theorists may be categorised as a splinter group. Essentially they agree with Malthus that control of population is inevitable and have pessimistic views that consider the growth of world population with fear and alarm. However, they disagree with Malthus that factors like war and famine are the key to population control and reject such simplistic notions. Instead they promote a number of ideals for example planned parenthood as a method of population control.

Marxism: Other opposition to Malthus's ideas came from the writings of Karl Marx and Friedrich Engels. Engels and Marx argued that what Malthus saw as the problem of the pressure of population on the means of production actually represented the pressure of the means of production on population. They thus viewed it in terms of their concept of the reserve army of labour. **Reserve army of labour** is a concept in Karl Marx's critique of political economy. It refers to the unemployed in capitalist society. The use of the word "army" refers to the workers being conscripted and regimented in the workplace in a hierarchy, under the command or authority of the owners of capital. In other words, the seeming excess of population that Malthus attributed to the seemingly innate disposition of the poor to reproduce beyond their means actually emerged as a product of the very dynamic of capitalist economy. Engels called Malthus's hypothesis "...the crudest, most barbarous theory that ever existed, a system of despair which struck down all those beautiful phrases about love thy neighbour and world citizenship."

9.4.2 Demographic Transition Theory

The Demographic Transition Theory explains the process of transformation of countries from high birth rates and high death rates to low birth rates and low death rates through a model (Fig. 9.3). That is why it is also known as Demographic Transition Model. This transformation took place as part of the economic development of a country from a pre-industrial economy to an industrialised economy. It is based on an interpretation by the American demographer Warren Thompson in 1929 about prior observed changes, or transitions, in birth and death rates in industrialised societies over the past two hundred years. In this model, most of the developed countries are beyond stage three of the model. Majorities of the developing countriesare either in stage 2 or stage 3. The model was based on

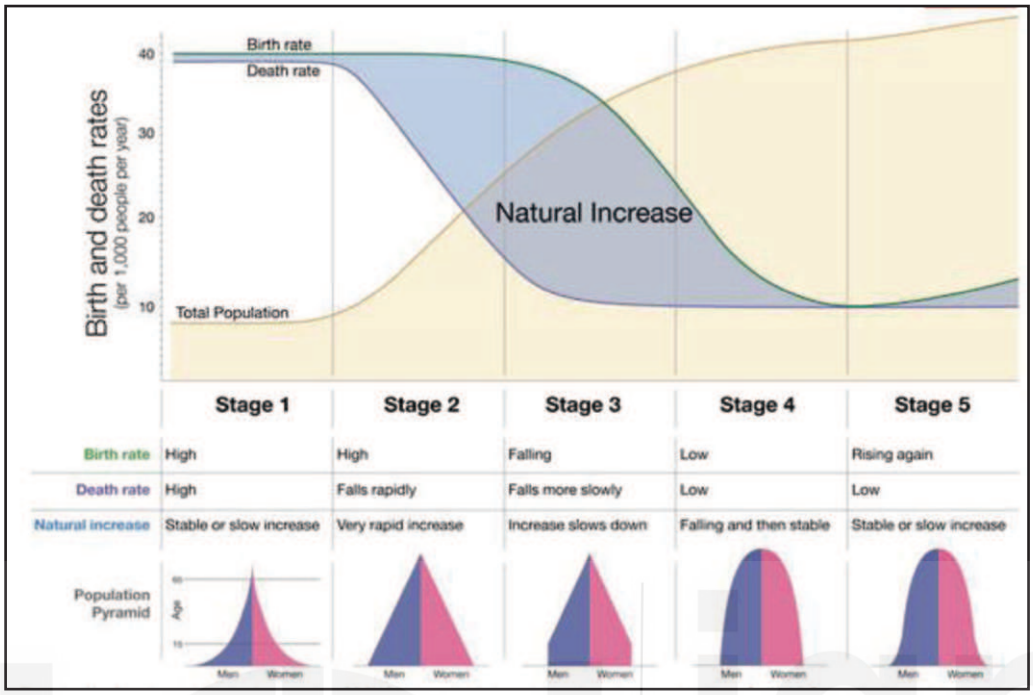


Fig. 9.3: The Demographic Transition Model.

Traditionally, transition involves four stages, but later on fifth stage was added by various theorists to explain the economic transition from manufacturing based industries into service and information based industries called deindustrialisation. These five stages are as follows:

1. **Stage one** represents pre-industrial society where death rates and birth rates are high and roughly in balance. Therefore either there is almost no growth or negligible growth. Can you find out the countries that are grouped under stage 1? (Fig. 9.4).
2. **Stage two** represents conditions of a developing country where the death rates drop rapidly due to improvements in food supply and sanitation. As a result of which there is an increase of life spans due to reduction of diseases. These changes usually come about due to improvements in farming techniques, access to technology, basic healthcare, and education. Without a corresponding fall in birth rates this produces an imbalance, and the countries in this stage experience a large increase in population. Find out from the Fig. 9.4 the countries that are in stage 2.
3. In **stage three,** birth rates fall due to access to contraception, increases in wages, urbanisation, a reduction in subsistence agriculture, an increase in the status and education of women, a reduction in the value of children's work, an increase in parental investment in the education of children and other social changes. Population growth begins to level off.

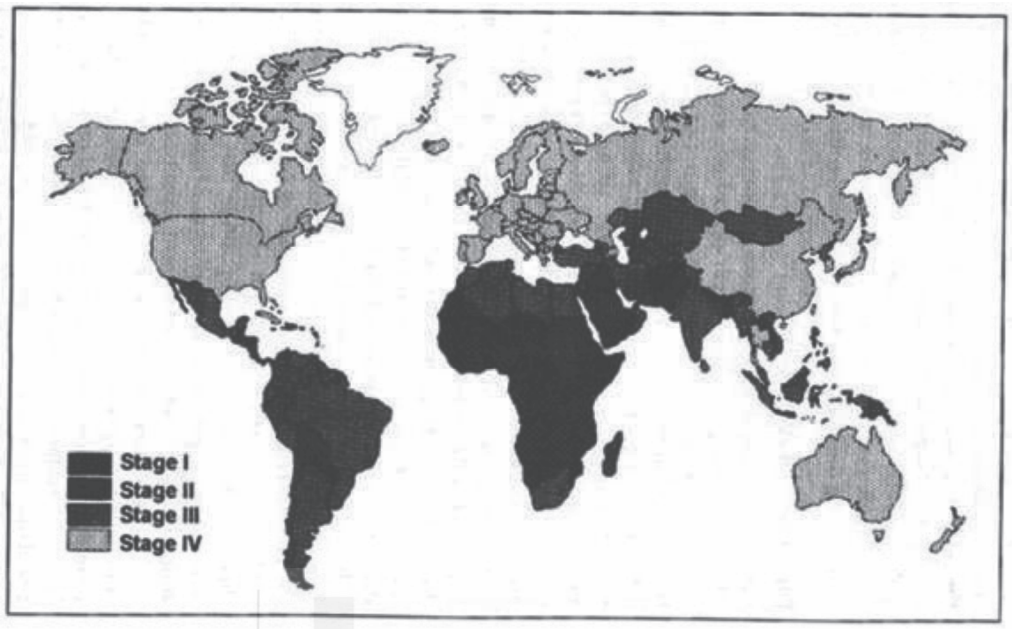


Fig. 9.4: Grouping of Countries according to Stage of Demographic Transition.

4. During **stage four** there are both low birth rates and low death rates. Birth rates may drop to well below replacement level as has happened in countries like Germany, Italy, and Japan, leading to a shrinking population, a threat to many industries that rely on population growth. As the large group born during stage two ages, it creates an economic burden on the shrinking working population. Death rates may remain consistently low or increase slightly due to increases in lifestyle diseases due to low exercise levels and high obesityand an aging population in developed countries.
5. As mentioned in the beginning of the section that the original Demographic Transition Model has just four stages. However, some theorists consider that a fifth stage is needed to represent countries that have undergone the economic transition from manufacturing based industries into service and information based industries. This is known as deindustrialisation. Countries such as United Kingdom (the earliest nation universally recognised as reaching Stage Five), Germany, Italy, Spain, Portugal, Greece, and most notably Japan, whose populations are now reproducing well below their replacement levels, are not producing enough children to replace their parents' generation.

Critical evaluation

Like all models, this is also an idealised picture of population change. Therefore, we should remember that the Demographic Transition Model is only a model and cannot necessarily predict the future. However, it gives

an indication of what the future birth and death rates may be for a country, together with the total population size. Therefore, there are limitations to it as with any model. This model makes no comment on change in population due to migration. Some of the major criticism about the model are as follows:

1. **Non-applicability to less-developed countries**: This model has a questionable applicability to developing countries, where information access is limited. For example, this model was validated primarily in Europe and North America where demographic data exists over centuries, whereas high quality demographic data for most of the developing countries did not become widely available until the mid 20th century. This model does not account for recent phenomena such as AIDS. HIV has become the leading source of mortality in these areas.
2. **Generalisation from European experience:** The model is mostly applicable for European countries in general. It also contained a hypothesis that other countries would follow the same pattern. The model assumes that countries will go through all the stages. Some countries may even skip stages. Demographic data for developing countries span about five decades, leading to questionable extrapolation of the experiences of the most developed countries.
3. **Economic development not sufficient cause to effect demographic change**: This model has also assumed that population changes are induced by industrial changes and increased wealth, without taking into account the role of social change in determining birth rates, e.g., the education of women. In recent decades more work has been done on developing the social mechanisms behind it. This model has also assumed that the birth rate is independent of the death rate. Nevertheless, demographers maintain that there is no historical evidence for society-wide fertility rates rising significantly after high mortality events. Notably, some historic populations have taken many years to replace lives such as the Black Death.

SAQ 3

Match the following countries with their stages of demographic transsition.

	Countries		Stage
A)	Afghanistan	i)	Stage II
B)	Japan	ii)	Stage III
C)	India	iii)	Stage IV
D)	Sri Lanka	iv)	Stage V

9.5 SUMMARY

In this unit, you have studied:

- Population is unevenly distributed all over the world. Population distribution can be analysed on various bases like scale of

concentration, on the basis of hemisphere, old world and new world etc.Factors responsible for the distribution of population is broadly grouped under physical and socio-economic factors.

- Density is one way of expressing distribution. Density of population is expressed as number of persons per square kilometer. This is popularly known as arithmetic density. Apart from this, various types of densities are calculated for specific purposes. Some examples are agricultural density, nutritional density, room density etc.

- Growth of a place is determined by fertility, mortality & migration. Population growth may be expressed in various ways. Natural Growth is the simplest expression which is the difference between birth rate and death rate whereas actual growth takes migration in to consideration. There are various theories related to population growth.

- In this unit we have discussed two important theories that explain about world population growth. These theories are Malthus theory and Demographic Transition Theory.

- The Demographic Transition Model is a model used to represent the process of explaining the transformation of countries from high birth rates and high death rates to low birth rates and low death rates as part of the economic development of a country from a pre-industrial economy to an industrialised economy.

- It is based on an interpretation by the American demographer Warren Thompson in 1929 about prior observed changes, or transitions, in birth and death rates in industrialised societies over the past two hundred years. Most developed countries are beyond stage three of the model; the majorities of developing countries are in stage 2 or stage 3. The model was based on the changes seen in Europe so these countries follow the Demographic Transition Model relatively well.

9.6 TERMINAL QUESTIONS

1. Why is world population not evenly distributed? Describe the factors affecting distribution of population in the world.

2. Compare trends and patterns of population growth between developed and developing countries.

3. Critically evaluate the Demographic Transition Theory.

4. What is Malthus theory? Describe the major criticism against Malthus theory.

9.7 ANSWERS

Self-Assessment Questions

1. a) The terms ecumene and non-ecumene differentiate between habited parts of the world from uninhabited parts of the world. Examples of such nonecumene areas are tropical rain forest, high mountainous areas, permanent ice covered Polar and Tundra region and mid-latitude deserts.

   b) **Nutritional Density** is the ratio between the total population and total cultivated area of a particular place. This is expressed as person per square kilometer of cultivated land.

   Agricultural density is expressed in terms of agricultural population per unit of cultivated area.

2. a) J-shaped population growth form indicates the population grows exponentially or logarithmic form and after attaining the peak value, the population will start declining.

   b) After 1950, the growth rate in developed world was very low in comparison to developing countries. This was because of remarkable decline in birth rate and death rate in developed countries, whereas in developing world, particularly in the countries with larger population base like China and India, there was a sharp decline in the death rate but birth rate remains high.

3. A - i; B - iv; C - ii; D - iii

Terminal Questions

1. Refer to Section 9.2.1
2. Refer to Section 9.3.1
3. Refer to Section 9.4.2
4. Refer to Section 9.4.1

9.8 REFERENCES AND FURTHER READING

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7. Trewartha, G. T. (1953). A Case for Population Geography, *Annals of the Association of American Geographers,* Vol. 43, pp. 71-97.

Acknowledgements:

Figure 9.1: Patterns of World Population Density

Source: https://images.populationpyramid.net/capture/?selector=%23pp-share-container&url=https%3A%2F%2Fwww.populationpyramid.net%2Fpopulation-density%2F2017%2F%3Fshare%3Dtrue

Figure 9.2: J-shaped growth curve of human population

Source:http://resilience.earth.lsa.umich.edu/units/population2/index.html

Figure 9.3: The demographic transition model

Source:https://upload.wikimedia.org/wikipedia/commons/8/8c/Demographic-TransitionOWID.png

UNIT 10

POPULATION CHARACTERISTICS

Structure

10.1 Introduction
Expected Learning Outcomes
10.2 Population Characteristics
Age-sex Composition
Sex Ratio
Age Dependency Ratio and Ageing
Demographic Dividend
10.3 Literacy and Skill Formation
10.4 Work and Occupational Structure
10.5 Summary
10.6 Terminal Questions
10.7 Answers
10.8 References and Further Reading

10.1 INTRODUCTION

In the previous unit we discussed about the distribution and growth of population all over the world. We have also discussed theories and models related to population growth. In this unit, we will discuss in detail about the population characteristics analysing population composition. Population composition reflects different types of subgroups that exist within total population of that particular geographical area. It may start from a village/ town, district, state, country or world as a whole. Various types of composition represents demographic, social and economic. Examples of demographic composition are age and sex composition. Religious, linguistic and ethnic composition represents social composition. Work and occupational structure are examples of economic attributes of composition.

You might be thinking about the necessity of studying these compositions of population. Understanding population composition enables geographers to gather important information about population dynamics. For example, knowing the composition of a population in terms of the total number of males and females, number and proportion of senior citizens and children, and number and proportion of people active in the workforce provide valuable insights in to the ways in which the population behaves now and how it might behave in the future.

Expected Learning Outcomes

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

- Identify different characteristics of population;
- describe age, sex and occupational composition; and
- explain the need for and importance of literacy and skill formation

10.2 POPULATION CHARACTERISTICS

Two of the most common variables in defining population characteristics are the age and sex composition of individuals within a given area. In this section we will discuss about age composition and sex ratio in details.

10.2.1 Age-Sex Composition

There are several ways to report age-related data such as single age return or grouping of the data in age-specific cohorts such as 0-4, 5-9, 10-14, 15-19 years and further, median age of the population and so on. Why do we report age related data in different ways? It's because such data are useful for policy purposes. Can you be able to give some concrete examples about various ways of reporting age related data and their applicability. Let us discuss some of the examples which will strengthen our understanding about it. For example, population in the age-cohort 15-59, 15-64 or 18-64 tells us about the potential population that can be economically active in terms of participation in labour market as workers whereas population below and above these ages are likely to be looked after as dependent. Men and women, boys and girls differ in terms of their share in age structure. For example, in general, women outnumber men in old ages and their widowed status puts them in vulnerable conditions. In some countries, there are more boys than can be accounted for naturally as compared to girls hinting at preferential treatment of boys.

What is a Population Pyramid?

Age and sex structure can be graphically illustrated by showing the distribution of various age groups by sex, commonly known as **population pyramids**. In other words, population pyramid depicts about the evolution of the population portrayed. In this pyramid, each age group of population is represented by a horizontal bar in which the length of the bar is proportional to the percentages of males and females in that age group. While constructing population pyramid, males are arranged to the left and females to the right of a vertical axis, which is divided either in to single years or interval of five years. The data can be in percentages or actual numbers which are to be calculated independently for males and females by dividing their number in each age cohort by the total number of respective population (see Fig. 10.2 and 10.3).

Population pyramids are of three types namely progressive, regressive, and stationary. Let us explain each type of pyramid and age sex characteristics associated with it.

i) **Stationary Population:** The word stationary refers to a condition which is not changing. In this context this means an unchanging fertility and mortality rates over a long period of time that produces a regularly tapering pyramid. A stationary population is a special example of a stable population with a zero growth rate, neither growing nor shrinking in size, and is equivalent to a life table population. By definition, stable populations have age-specific fertility and mortality rates that remain constant over time.

ii) **Progressive Population**: This kind of situation is observed in a country where increasing birth rate and high death rate is prevalent. As a result of which this demographic trend when plotted in a graph, it produces a wide base and rapidly tapering pyramid. This gives a concave look to the diagram if we join outermost point of each bar.

iii) **Regressive Population**: This is just opposite to what we described in progressive population. Can you be able to describe what regressive population is? This refers to a situation where declining birth rate and low mortality rate is being observed. This produces a narrow based pyramid. This gives a convex look to the diagram if we join outermost point of each bar.

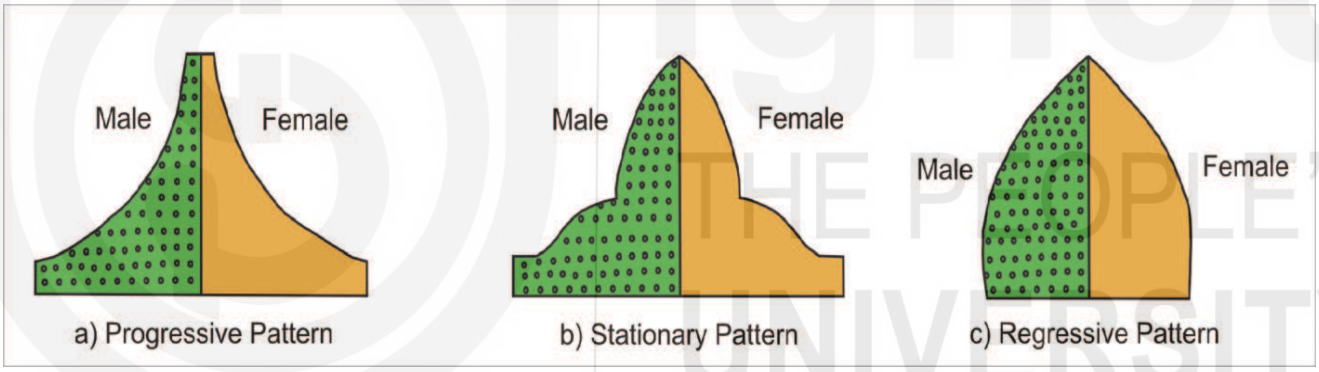


Fig. 10.1: Types of Population Pyramids.

Till know you my have realised that the difference in population growth rate between rich and poor countries affects both population size and age structure so that their pyramids assume different shapes. In a slow growing population, the number of births each year nearly balances the number of deaths. Since most of the deaths occur at older ages, the numbers of individuals in different age groups are roughly equal up to older ages. The so-called population pyramid of a slowly growing population thus resembles a column. If a population grows rapidly, each birth cohort is larger than its predecessor and the population pyramid would take a triangular shape (Cohen et al., 2003).

Let us explain this with two examples from India that represents two extreme cases i.e. progressive and regressive respectively. The following pyramids are for Kerala and Uttar Pradesh – states which differ significantly from each other in their developmental attributes. (see Fig. 10.2 and Fig. 10.3) Can you identify the type of population pyramid these two states represent?

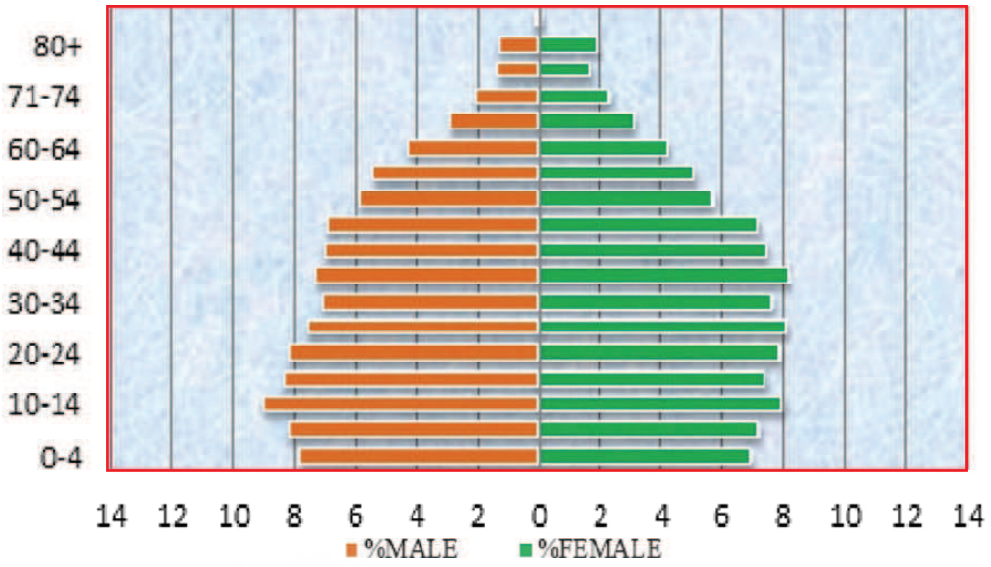


Fig. 10.2: Age-Sex Pyramid of Kerala, 2011.

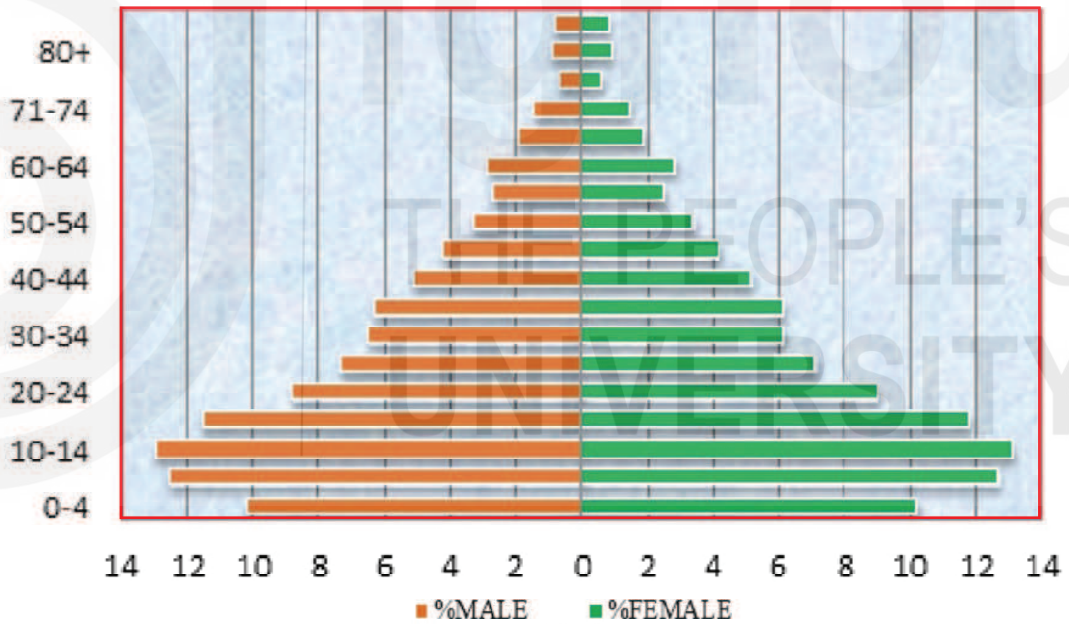


Fig. 10.3 Age-Sex Pyramid of Uttar Pradesh, 2011.

Uttar Pradesh has typical age pyramid which is characterised by a broad base and a tapering top indicating high fertility and high mortality levels whereas Kerala has more uniformly distributed age structure with marked share of aged population, women outnumbering men at older ages. These pyramids reflect varying age and sex patterns – net outcome of fertility, mortality and longevity rates in these states.

SAQ 1

a) What is a population pyramid?

b) Differentiate between progressive and regressive population pyramid.

10.2.2 Sex Ratio

Sex composition of the human population is one of the basic demographic characteristics. One of the ways we can look at this composition is through sex ratio. Do you know this ratio is not uniformly estimated all over the world?

You might also be thinking that why do we calculate such ratio? We have tried to address such questions and many more in the following section.

A. Sex Ratio

Sex ratio can be defined as a simple count of the number of males and females in the population. The overall sex ratio and the temporal changes that occur therein tells us about underlying socio-economic processes as also how the males and females are being treated in a society at a given point of time.

In most of the countries, world over, sex ratios are indicated in terms of males vs. females for a standard unit of population, usually 100 persons. The way to calculate the ratio is:

$$\frac{\text{Number of males}}{\text{Number of females}} \text{ X } 100$$

Some countries such as India, however, calculate the ratio of females per 1000 males. In such a case it is

$$\frac{\text{Number of males}}{\text{Number of females}} \text{ X } 1000$$

Sex ratios can be obtained for population as a whole, and specific age-groups such as working age population and so on.

Overall sex ratios get affected by a complex intermixing of various factors. Let us discuss some of the factors in brief.

- **Male selective out migration** in a given region may result in a sex ratio whereby women may outnumber men in a given region and vice versa if there is male in-migration.
- **Differential mortality rates for females** likewise can tilt the sex ratios in favour of males.

Although there is wide variation in sex ratios of countries in the world, the sex ratio of almost all populations in the world shows more females than males as a result of increased life expectancy favourable to females. To cite a few examples as per the 2013 data, the male/female ratio is 99 in Australia and Sweden, 97 in England and USA. Asian population is the exception in that most countries therein have more males than females. For example, this ratio is as high as 107 for India, 108 for China, 116 for Bhutan. The world's average is 102 (http://www.unfpa.org/gender/docs/Sex_Ratio_by_ Country_ in_ 2013.pdf).

Initially, the huge gap was observed between the number of males and females. This was mostly due to higher mortality amongst girls at younger ages and high maternal mortality that had been unfavourable to women in particular during the past century. But in more contemporary context, in

many countries of Asia, the sex ratio at birth (SRB) has been tilting towards boys essentially through sex-selective abortion of female foetuses, neglect towards girl children and also partially via infanticide due to a strong preference for sons. The permutation and combination of these factors may vary over the country. India is case in point. While some pockets have traditionally been known for practicing infanticide, there are regions where girl children are particularly neglected. Ironically sex selective abortions seem to be rising with more urbanisation and spread of education.

We will discuss on SRB in subsequent sections.

SAQ 2

State factors responsible for overall sex ratio of a place.

B. Child Sex Ratio

As mentioned in the previous section, SRB is a matter of concern in Asia in general and India in specific.

At conception there are more male foetuses so that slightly more boys than girls are born. The normal sex ratio at birth thus is somewhere in between 104-106 baby boys born for every 100 baby girls, subject to local biological variations. A SRB of 105 is generally taken as normal. World over, this ratio tends to 'improve' in favour of girls after birth as boys show somewhat higher mortality rates within one year of the birth. If gender discrimination against one particular group is totally absent, the values of the child sex ratio should fall below 105. However, The SRBs are marked by large inter and intra—country variations. To cite a few examples, USA and UK's SRB is 105 baby boys to 100 baby girls; the corresponding figures are 106 for Australia, Canada, Denmark and Germany. But in Asia as a whole, the child sex ratio instead recorded a slight increase over the past half century – from 105 in the mid-1950s to 108 in 2005, the latter a value clearly above standard levels. More detailed data show that this overall increase in the proportion of boys among children is chiefly the consequence of increasing distortion observed in East and South Asia.

As per the World Fact Book published by CIA, China and India had SRB of 112, a severe imbalance with male babies outnumbering baby girls. Detailed figures for China and India show that the child sex ratio in these countries has long been above normal values, as seen in the data from the 1950s and 1960s. But in addition to this legacy, the situation worsened in these countries from the early 1980s onwards. This was the case especially for China, where, by 1990, the sex ratio among children had already reached the record value of 110. Along with China, several Caucasian countries had a child sex ratio above 115 in 2005, while countries outside of Asia usually record values of 101-105 (Guilmoto, undated).

It is the distorted SRB combined with general neglect towards girls which has in fact offset the opposite progress in sex ratio as observed among adults as improvements in mortality among adults have particularly

benefited the female population. What have recently changed in Asia are the overall age patterns of sex discrimination: sex discrimination used to be more evenly distributed over the lifespan, but there is now a deep change affecting the new generations at the bottom of the age pyramid. India is a case in point.

Child-Sex Ratio in India

Let us look at India at a greater detail. In India, the ratio has risen considerably in the recent past. As per the data in the Sample Registration System (SRS), SRB in the 1980s were generally close to 110. As of three years average for 2005-2007, the SRB at the national level was 111 boys to 100 girls as per the SRS. Data and indirect estimates from different sources such as Census, SRS and National Family Health Surveys differ on SRB, but there is a general consensus that the SRB has progressively become more masculine in the early 1990s, declined somewhat and risen again after 2000. The average conceals a large regional variation – for the same reference years, the SRB varies from 104.4 in Kerala to 119.5 in Punjab. In general, the north-western part of India always had higher SRBs as compared to other parts of India. Rising SRBs are relatively more recent phenomena in Himachal Pradesh, Maharashtra, Gujarat and Jammu and Kashmir (Kulkarni, 2007). Although southern states are relatively better off, it can be seen that the north-south differentials are being rapidly obliterated.

AS far as the child (0-6) sex ratio (CSR) is concerned, it is to be noted that India calculates the sex ratio by counting the number of girls per 1000 boys. As pointed out earlier, the sex ratio at birth is normally 105 boys per 100 girls (with variation in the range 103-107). Converted into Indian convention of females per 1000 males, this works out to 952 girls per 1000 boys (100x1000/105) rounded to 950. If there is no sex differential in mortality during early childhood, the ratio for the age group should also be near 950.

As opposed to the overall sex ratio which has shown slight improvement, the situation is progressively worsening as far as the child sex ratio is concerned. It is defined as the ratio of girls to boys in the 0-6 years of age group. Declining CSR had primarily caught the attention across the country during the last two decades, particularly since 1991 census that had published the population under 7 for the first time. Given the preference for boys in general, a CSR of 950 girls to 1000 boys is seen as acceptable in the Indian context. In 1991, there were 945 girls to 1000 boys for India as a whole which has dramatically dropped to 927 in the 2001 Census. The 2001 census not only saw a sharp decline of 18 points at the national level with child sex ratio of 927, some pockets of the country particularly the north-west had recorded CSR of 850 and below with some of the prosperous states such as Punjab (-77), Haryana (-60), and Gujarat (-45) occupying the top positions in terms of declining number of girls over the decade. The urbanized Delhi (-47) and Chandigarh (- 54) were no better. Although the rate at which the

proportion of girls is declining seems to have slowed down during the decade 2001-2011, it is still below the critical threshold of 950. Moreover, the worst affected states in 2001 – Haryana, Himachal Pradesh, Punjab along with Delhi and Chandigarh have improved their CSR in 2011. That said, a majority of districts in Haryana and Punjab continue to remain in the dubious category of CSR of 850 and below. More importantly, several districts in Andhra Pradesh, Jammu and Kashmir, Maharashtra, Rajasthan and Uttar Pradesh are now showing worsening CSRs. In a nutshell, while the old pattern of dismal CSR is almost stagnant or show some reversal in the CSRs over the decades, there are newer areas where CSRs are falling with alarming alacrity. It is no longer specific communities or regions that are characterized by low CSRs.

The rural-urban situation is rather disturbing. The urban child sex ratios are invariably lower than the rural; post 1991, the decline in urban CSR is particularly sharper than the rural CSR. However, the recent CSR count shows that the rural CSRs are fast catching up with their urban counterparts.

In initial stages, selective undercount of girls, fewer abortions and retention of male foetuses with improved reproductive health-care facilities and reducing mortality differentials were often cited as the reasons for fewer numbers of girls being born as compared to boys in the population. However, the CSRs were becoming too skewed in favour of boys to be explained by these factors. Now, the widespread awareness about the availability of and access to the technology that makes it possible to detect the sex of the unborn child (amniocentesis) is seen as a major contributing factor having an unbalancing impact on the sex ratios at birth (SRB) which eventually reflect in CSRs.

SAQ 3

Why is Child Sex Ratio skewed in favour of boys?

10.2.3 Age Dependency Ratio and Ageing

Do you know the relevance and utility of calculating age-dependency ratios? These are the measures for understanding the age structure of the population. They relate to the number of individuals that are likely to be "dependent" on the support of others for their daily living – youths and the elderly – to the number of those individuals who are capable of providing such support – the working population. The definition of dependent population varies across the countries. It can be conceived as below 15 and above 60 years of age, as is a common practice in India. Alternatively, given the longer years that people live now and as per the country specifications regarding who are considered as youth, the dependent population can be below 15 and above 65 years of age. In some cases, the dependent population is seen as consisting of those below 18 and above 65 years of age. ***The age-dependency ratio is calculated as the ratio of the dependent population to the working population,***

whichever way the working population is defined. These ratios are presented as number of dependants per 100 persons.

According to the World Bank data for 2012, which took the dependent population as the excluding 15-64 years of age, the age-dependency ratio expressed as the proportion of dependents per 100 working-age population varied from around 3 in Bahrain, Kuwait, 4 in Saudi Arabia and Uganda 5 to 39 in Japan, 32 in Germany, 29 in Sweden, indicative of the aging population in the latter countries.

As far as India is concerned, the available data from the Sample Registration System show that there has been a gradual decline in the share of population in the age-group 0-15 from 41.2 to 38.1 per cent during 1971 to 1981 and 36.3 to 29.5 per cent during 1991 to 2011. At the national level, about 30.9 per cent of rural and 25.5 per cent of urban population belongs to this category. The rural variation ranges from 23.3 per cent in Kerala to 37.9 per cent in Bihar. The corresponding urban figures are 20.2 per cent in Jammu and Kashmir and West Bengal 31.7 per cent in Bihar. Longer lives mean added numbers to the elderly population. The proportion of elderly persons aged 60 and above in the population of India increased from 5.63 per cent in 1961 to 6.58 per cent in 1991 and to 7.5 per cent in 2001. The corresponding figure for 2011 is 8.0 per cent. The proportion is likely to reach 12 per cent in 2031 and 17 per cent in 2051 (Rajan 2006). Women outdo men in this regard – their percentage is 8.4 as compared to men which account for 7.7 per cent. Kerala, Tamil Nadu and Himachal Pradesh with 12.6, 10.5 and 10.4 per cent top the list of major states. Delhi is at the bottom with 5.9 of its population in the age-group 60 and above.

It cannot be denied that increased life expectancy encapsulate a whole range of improved parameters of health and well-being. However, there are several issues associated with aging which require sensitive handling. A high dependency ratio implies burden on the working population because it has not only to provide for the pension, financial support and social security benefits of the non-working population, either directly through family support or indirectly through taxation, health – physical as well as emotional (including a sense of deprivation and loneliness) pose major concerns. Treating old people as a pool of experienced citizens rather than a burden is another issue which requires attention. Ageing has a gender dimension that can no longer be ignored. For example, women's longer life-spans compared to men, combined with the fact that men tend to marry women younger than themselves, mean that the widows will outnumber widowers in general. Given the male-dominated societal structure in India, with a few exceptions, women in India largely rely on the male members of the household for economic resources and social status. Thus in case of widowhoods, a large percentage of older women are at risk of dependency, isolation, and/or dire poverty and neglect.

SAQ 4

What is dependency ratio?

10.2.4 Demographic Dividend

Have you ever heard this term? This has been discussed in our country for a long time. It has been argued that India should reap the benefits of demographic dividend. Let us discuss about the concept of demographic dividend in general and in the context of India in specific.

The demographic transition is one of the most remarkable developments to have taken place in the twentieth century. The principal features of the transition are from a regime of high mortality and fertility to one of low mortality and fertility. Though in most cases the transition begins with sustained mortality decline along with sustained decline in fertility, the timing and pace has varied across world's regions as well as over populations within regions. In Europe, for example, substantial mortality decline and some fertility decline began as early as in the nineteenth century, for the developing world, the transition began in the twentieth century. In India, the process can be said to have begun after the second decade of the last century.

In addition to the obvious effect on population size, the age-structures change through the transition, populations begin to age and over time, the share of the elderly rises substantially at the cost of the share of the young. Sometime during the process, with fewer births each year, a country's young dependent population grows smaller in relation to the working-age population. The share of the working age population increases providing for limited time 'a window of opportunity ' for rapid economic growth. This has been termed as the 'demographic dividend'; it accrues in populations that experience rapid fertility declines – a phenomenon which has been observed in East Asian populations. India has just begun to gain this benefit (Kulkarni, 2011).

As compared to the developed world, most of which are experiencing aging populations, it is in the context of emerging economies in the developing world that we usually talk about the progressively increasing working age population. As per the World Bank Mundi Index, Japan has about quarter of its population in 65 plus age group, Denmark, France and Switzerland accounts for little over 17 per cent in this age cohort as compared to China (9 per cent), Sri Lanka (8 per cent), and India (6 per cent). Japanese population over the age of 65 is expected to increase to 40 per cent by 2055. Japan's working age population, i.e., those in 15-64 age group accounts for 52.7 per cent of its population. This percentage is as high as 73.5 in China and about 68 per cent in Australia and Canada.

As far as India is concerned, for decades together the successive census figures in the country provided no respite from ever increasing population. However, the last two decades have shown that the country is now moving towards the final stages of demographic transition in which the mortality rate falls while the birth rate remains high, and later the birth rate falls as mortality remains low. The death rate has steadily declined in the country since the 1920s. The pace of decline in total fertility rate (TFR) - births per women throughout her reproductive span which is the age cohort of 15-49

years - has quickened in the country in recent years. The TFR has declined by roughly 1.5 per cent per year from 6.0 in 1966 to 3.6 in 1992 and to 1.7 per cent per year during 1992–2008 with TFR reaching 2.6 births per woman by 2008. According to the latest available data for 2011, India's TFR now stands at 2.4. It is anticipated that the median age of an Indian citizen will be 29 years in 2020, in comparison to 48 for Japan and 37 for China.

There are, however, significant regional variation with Bihar on one hand (3.6) and Tamil Nadu and West Bengal on the other (1.7). The replacement level of TFR leading to population stabilization, considered to be two children per women, has been achieved by Jammu and Kashmir, Karnataka (1.9), Andhra Pradesh, Delhi, Himachal Pradesh, Kerala, Maharashtra and Punjab (1.8) (RGI, 2013).

The proportion of economically active population (15-59 years of age) has increased from 53.4 to 56.3 per cent during 1971 to 1981 and 57.7 to 62.5 per cent during 1991 to 2011. If another 5 years are added to this cohort, the population in the age-group 15-64 is estimated to reach 68 per cent of the total population by 2035 (United Nations, 2011). In 2011, amongst major states, Bihar has the lowest percentage (55.8 per cent) while Andhra Pradesh topped the list with 66.6 per cent of their population in the age group of 15-59 (RGI, 2013).

A decline in working age population has implications for any country's potential to economic growth. Changing demographic structures implies potentially more workers, particularly in the productive age groups with associated increase in incomes, savings and capital per worker leading to growth. Also, because demographic change is associated with fertility declines, the transition period is likely to be accompanied by greater female participation in the labour force.

Although there is a general appreciation of the existence of such demographic opportunity, whether a country will be able to harness such an opportunity as the dividend is open to debate and is of considerable interest. Many scholars argue that there is nothing automatic about the links between demographic change and economic growth; whether the demographic change in population would act as a dividend or a liability is determined by the overall policy environment towards youth and their employability in the labour market. The recent data on employment, for example suggest that the absorption of the Indian youth into the labour force is not as high as one would expect, partly because of poor educational/skill and health attainment etc. These issues need to be attended to in order to take advantage of the opportunity for growth that the demographic dividend is supposed to usher in.

SAQ 5

What is demographic dividend?

10.3 LITERACY AND SKILL FORMATION

One of the positive indicators for measuring population characteristics of a society is knowledge level. One of the major parameters widely used for measuring knowledge is literacy. Today, it has been acknowledged that being mere literate would not help much. If we want to take advantage of knowledge economy then we have to move from literacy to skill formation. In this section, we will discuss about both literacy and skill formation both at global as well as national level.

The need to educate and develop young people's skills has become urgent as the countries around the world are grappling with financial and other challenges as the economies become knowledge-based. The working age population requires skills in order to be gainfully employed and participate fully in a given society. As pointed out earlier, young people are more numerous than ever. Globally, the population aged 15 to 24 reached over 1.2 billion in 2010. Jobs are not being created fast enough to meet the needs of this large youth population. Around one in eight people aged 15 to 24 is unemployed; young people are about three times as likely as adults to be unemployed. With a possibility of further increase in youth unemployment along with the prospect of remaining without secure work makes it eminent to pay attention to literacy, education and skill formation.

Literacy i.e., ability to read and write is the foundation stone for subsequent education and skill formation. Apart from its intrinsic value, literacy is intricately linked with other developmental parameters such as poverty reduction, fertility monitoring and so on. It is a key indicator for socio-economic progress of any country.

According to UNESCO's *Global Monitoring Report on Education for All (2006)*, South and West Asia has the lowest regional adult literacy rate (58.6 per cent), followed by sub-Saharan Africa (59.7 per cent), and the Arab States (62.7 per cent). Countries with the lowest literacy rates in the world are Burkina Faso (12.8 per cent), Niger (14.4 per cent) and Mali (19 per cent). The report shows a clear connection between illiteracy and countries in severe poverty, and between illiteracy and prejudice against women.

According to data released for 2013 by the UNESCO Institute for Statistics (UIS), literacy rates for adults and youth continue to rise. Young women aged 15-24 are making the strongest gains, but still they lag behind young men. In 2011, 87 per cent of female youth had basic literacy skills, compared to 92 per cent of males. Despite these gains, however, 774 million adults (15 years and older) still cannot read or write – two-thirds of them (493 million) are women. Among youth, 123 million are illiterate of which 76 million are female. Even though the size of the global illiterate population is shrinking, the female proportion has remained virtually steady at 63 to 64 per cent (UIS, 2013).

Table 10.1: Global Literacy Rates for Adults and Youth, 2011

Adult literacy rate, total	84.1%
Adult literacy rate, male	88.6%
Adult literacy rate, female	79.9%
Adult illiterate population, total	773.5 million
Adult illiterate population, female share	63.8%
Youth literacy rate, total	89.5%
Youth literacy rate, male	92.2%
Youth literacy rate, female	86.8%
Youth illiterate population, total	123.2 million
Youth illiterate population, female share	61.3%

Source: UNESCO Institute for Statistics, September 2013

As per the 2011 Census, 73 per cent of India's population was literate. Although it is quite an achievement, the level is still below the world' average literacy rate of 84 per cent; the 2011 Census indicated a 2001–2011 decadal literacy growth of about 9 per cent which is slower than the growth seen during the previous decade. Also, despite a decline in the absolute numbers of illiterates for the first time in 2011, India continues to contain world' largest illiterate population.

2015 is the target year for Education for All and the Millennium Development Goals. By then about two thirds of adults and three-quarters of youth in sub-Saharan Africa are expected to be able to read and write. Central Asia, Central and Eastern Europe, East Asia and the Pacific, and Latin America and the Caribbean are likely to gain near universal youth literacy. In the Arab States and South and West Asia, approximately nine out of ten young adults between the ages of 15 and 24 years are projected to be literate. Adult literacy rates are estimated to continue to rise in the coming years but are expected to remain below the youth literacy rate in nearly all regions. The global adult literacy rate is estimated to reach 86 per cent by 2015 and the youth literacy rate 92 per cent (UIS 2013).

Table 10.2: Literacy in India

	2001			2011		
	Total	Rural	Urban	Total	Rural	Urban
Literacy	64.8	58.7	79.9	73.0	67.8	84.1
Male literacy	75.3	70.7	86.3	80.9	77.2	88.8
Female literacy	53.7	46.1	72.9	64.6	57.9	79.1

Source: Census of India, 2011

Significantly, the female literacy level saw a significant jump as compared to males. The female literacy in 2001 was 53.7 per cent which has gone to 64.6 per cent in 2011. The male literacy, in comparison, rose from 75.3 to 80.9 per cent. Among the major states, Kerala continues to occupy the top most position with 95.1 per cent while Uttar Pradesh is at the bottom (75.1 per cent).

Literacy is considered to be a stock variable. That is to say, it covers the entire literate population, young, adults and old who might have acquired literacy in the past. Gross enrolment ratios which is a flow variable tell us about the contemporary situation in educational attainment. The entire spectrum of educational attainment can be grouped under primary, secondary and tertiary education. Primary and secondary education is self-explanatory - Primary education is the first stage of compulsory education although the precise nomenclature used may differ across countries. For example, in North America, this stage of education is usually known as elementary education. Secondary education follows primary education. The post-secondary stage of education - also referred to as third stage, third level - is known as tertiary education and includes universities as well as institutions that teach specific capacities of higher graduate and post-graduate learning such as colleges, technical training institutes, community colleges, nursing schools, research laboratories, centers of excellence, and distance learning centers. Tertiary education generally culminates in the receipt of certificates, diplomas or academic degrees, or The following Table provides Gross Enrolment Ratios for Primary, Secondary and Tertiary education. Gross enrolment ratio is the ratio of total enrolment (regardless of age) to the population of the age group that officially corresponds to the level of education shown. A ratio of more than 100 thus indicates over-age students.

It is to be noted that the data are not strictly comparable because of inclusion/ exclusion of certain faculties still the drop-out at the tertiary level is quite clear.

Table 10.3: Gross Enrolment Ratios for Primary, Secondary and Tertiary Education

Countries	Primary	Secondary	Tertiary
India	118	60	16.2
China	111	81	25.9
Australia	104	96	94.8
Japan	103	102	59.0
United states	102	96	94.8
Sri Lanka	99	87	15.5

Source: Human Development Report 2013

SAQ 6

What are stock and flow variables of literacy?

10.4 WORK AND OCCUPATIONAL STRUCTURE

Till now, we have discussed demographic and social composition that reflects population characteristics of a society or country. In this section, we shall dwell upon economic characteristic. Do you know what the various ways of measuring economic characteristic are? Occupational Structure is one of the widely used methods for understanding economic composition.

There is no standardized definition of work across the countries. Thus defining what constitutes work and how it is counted in the formal data gathering is quite a debatable issue. And yet by and large, work is primarily defined as ***participation in any economically productive activity with or without compensation, wages or profit.*** Such participation may be physical and/or mental in nature including supervision and direction given to other workers. Do you know there are quite a few activities which are undertaken within home premises and outside which do not directly come under the purview of economically productive activities? Can you suggest some of the activities which are not considered as work? Some of the examples are free collection of fuel, fodder or collection of minor forest products such as edibles, medicinal plants etc. If such activities are attributed for money, their contribution, particularly in poor households can be significant. Despite debates around expanding the boundaries of what is work in the formal accounting, most of the countries continue to count work within the economically gainful limits.

Workers can be grouped as principal, main, permanent workers or as subsidiary, marginal, seasonal, temporary workers depending upon the reference period during which such work has been carried out. However, the classification is not based on any standard universally applicable criteria. Work can be carried out in formal and informal economy, generally coterminous with organized and unorganized sectors.

The International Labour Organization (ILO) defines informal economy as all economic activities by workers and economic units that are, in law or in practice, not covered or insufficiently covered by formal arrangements. In simpler terms, the workers here are outside the protective labour laws or legislation. The formal economy, on the other hand covers work where the terms of employment are regular and where people have assured employment. It is registered, follows government rules and regulations. In short it has some formal processes and procedures.

The workers are categorised as main or marginal depending upon the duration. The main workers are those who had worked for the major part of the year preceding the date of enumeration i.e. for 183 days (six months) and more during the last year. All those who had worked any time in the year preceding the date of enumeration, but did not work for a major part the year i.e. for less than 183 days or six months were termed as marginal workers. The 2011 Census further classifies the marginal workers in two categories: those who worked for three months or less and those who worked between three to six months.

The occupational structure is shaped by various factors: the structure of the economy (the relative weight of different industries); technology and

bureaucracy (the distribution of technological skills and administrative responsibility); the labour-market (which determines the pay and conditions attached to occupations); and by status and prestige (influenced by occupational closure life-style, and social values). It is difficult to attach causal primacy to any one of these factors; moreover, their role in shaping the occupational structure changes over time, as society changes. For example, during the early phase of European industrialization, the dominance of manufacturing made for a preponderance of manual occupations, while in recent times the shrinking of this sector, together with the growth in services, has made for an expansion of white-collar occupations. The distinction between manual and non-manual occupations has also become blurred.

The occupational structure is described and analysed by means of various classificatory schemes, which group similar occupations together according to specific criteria such as skill, employment status, or function. Such classifications are also used as a basis for the empirical analysis of economic and social class.

There are two main sources of information on work status of the Indian population: Census and the National Sample Survey Organisation (NSSO). While Census is a decadal exercise, the NSSO conducts Employment and Unemployment surveys every four years, which are known as thick rounds covering larger samples. Census is the full coverage whereas the NSS, as the name suggests, is based on samples. While Census's main task is population count, the information available on work through it is limited albeit one can go to smaller units such as the villages. The NSS on the other hand provides a much larger repertoire of information. Besides, the NSS captures work in a better way than the Census because of the way it takes into consideration the reference period and counts work in usual, weekly and daily statuses. The usual status approach does not capture changes in the activity pattern caused by seasonal fluctuations whereas the current weekly and current daily status approaches are expected to reflect the overall effect caused by intermittent changes in the activity pattern during the year. The latter reflects even the changes that take place during a week.

The concept of work in Indian census was introduced since 1961 census, but the reference period was changed and the concept of main activity was introduced in 1971. The 1971 census did record the marginal category of workforce. Thus the figures of 1961 and 1971 censuses were not comparable. On the other hand, we find that since 1981 the census definition of work remains unchanged, but more efforts have been made to enumerate female workforce in later censuses. In the 1981 census, attempt was made to get a detailed profile of the working characteristics of the population. Also, usual status of the work was given emphasis instead of the current status of the work. A question was to divide the population who have worked any time and not worked at all during the last year. Those who have worked any time in the last one year were categorised as workers, and those who did not work at all were classified as non-workers. This type of classification of population into workers and non-workers

category was followed in latter censuses as well. The categories into main and marginal workers were introduced from the 1981 census onwards.

In both the Census and the NSS, the information on work is based on the respondents' reporting. Moreover, what is 'economically productive work' is quite a debatable concept. For example, there are activities such as free collection of fuel, fodder and edibles which, when imputed for money, can be seen as 'economically productive work'. There are many such examples. However, what constitutes work and what is not is influenced by socially driven perception, particularly as it relates to women whose primary location is often seen as within the confines of home.

Here we use the NSS data for an overview of the workforce participation and characteristics because a) this is the latest data set available b) the focus is on employment and unemployment per se and 3) information is more detailed. The workers' data, available for 2011 Census, is limited. According to the latest information available through the Census 2011 NSS 68th Report covering 2011-2012, there is an overall decline in workforce participation rates as compared to 2005-05 for those in the working age group (15-59 years of age), both men and women – the decline being significantly higher for rural women as compared to urban counterparts. Some scholars argue that this decline is mainly due to rising participation in education among young women; others have been pessimistic and suggest the decline, particularly for women is because of stagnating agricultural situation and slowdown of economic growth in the country.

Workers can be broadly divided in agricultural, secondary and tertiary sectors. Out of the total workers, about 49 per cent, 24 per cent and 27 per cent were engaged in agricultural sector, secondary sector and tertiary sector, respectively. In rural areas, nearly 59 per cent of the male workers and nearly 75 per cent of the female workers were engaged in the agricultural sector. Among the male workers, 22 per cent and 19 per cent were engaged in secondary and tertiary sectors, respectively. The corresponding proportions for female workers were 17 per cent and 8 per cent, respectively. In urban areas, nearly 59 per cent of male workers and 55 per cent of the female workers were engaged in the tertiary sector. The secondary sector employed nearly 35 per cent of the male and 34 per cent of the female workers. The share of urban workforce in agricultural sector was nearly 6 per cent for male workers and 11 per cent for female workers.

Agricultural employment during the years 2009-10 and 2011-12, fell by about 13 million in absolute terms, the fastest decline in such employment. The share of agriculture in total employment was 60 per cent in 1999-2000 which came down to 53 per cent in the 10 year period, by 2009-10. In 2011-12, the share of agriculture in total employment stood at 49 per cent, a four-percentage-point fall within two years. The fall in agricultural employment is matched by agriculture's declining share in Gross Domestic Product (GDP) over the years. The 2011 census also shows a decline in agricultural workers. More importantly, the data show the shift from cultivators to agricultural labourers indicative of increasing landlessness amongst the farmers.

There is thus a shift in employment out of agriculture towards industry and services with accompanied increase in industrial as well as services employment in 2011-12. While the break up between manufacturing and non-manufacturing sector employment is not given for 2011-12, it is expected that it is mostly in the construction sector. The rise in regular and salaried employment highlighted by this latest NSS round is also noteworthy - regular wage/salaried employment is considered to be better in terms of work conditions and some measure of social security. However, one needs to ask the question in which arena this regular salaried work has increased. For example, one of the most talked about phenomenon of recent increase in salaried employment has been that of women as domestic maids, a sector which despite being classified as 'salaried' segment remains outside the protective labour laws and legislation.

The NSS divides workers in three main categories: self-employed, regular wage/salaried and casual labour. The most significant feature of India's labour market in recent years has been the overwhelming concentration of workers in self-employed category. As per 2011-12 data, the share of self-employed was 52 per cent; regular wage/salaried employees and casual labour were 18 per cent and 30 per cent, respectively. In the rural areas, the shares of self-employed, regular wage/salaried employees and casual labour were 56 per cent, 9 per cent and 35 per cent, respectively. In the urban areas, the shares of self-employed and regular wage/salaried employees were 42 per cent and 43 per cent, respectively and the rest (15 per cent) were casual labours.

Men and women continue to fare differently in terms of job opportunities. As far as the male/female workers are concerned, the shares of self-employment in total workforce were 55 per cent for rural males, 59 per cent for rural females, 42 per cent for urban males, 43 per cent for urban females. The corresponding shares of casual labour were 36 per cent, 35 per cent, 15 per cent and 14 per cent for rural males, rural females, urban males and urban females, respectively. The relatively higher as well as increasing percentages of workers in self-employment point towards limited job opportunities in the formal labour market. Also, some of the work catering to the formal labour market is now being carried out informally at home-based units.

SAQ 7

Define work. Name any four activities which are not considered as work.

10.5 SUMMARY

In this unit, you have studied:

- Sex ratios can be obtained for population as a whole, and specific age-groups such as working age population and so on. Overall sex ratios get affected by a complex intermixing of various factors: Male selective out migration and Differential mortality rates for females.
- The age-dependency ratio is calculated as the ratio of the dependent population to the working population, whichever way the working

population is defined. These ratios are presented as number of dependants per 100 persons.

- Age and sex structure can be graphically illustrated by showing the distribution of various age groups by sex is commonly known as population pyramid. Population pyramids are of three types namely progressive, regressive and stationery.
- The share of the working age population increases providing for limited time 'a window of opportunity ' for rapid economic growth. This has been termed as the 'demographic dividend'; it accrues in populations that experience rapid fertility declines – a phenomenon which has been observed in East Asian populations. India has just begun to gain this benefit.
- Literacy i.e., ability to read and write is the foundation stone for subsequent education and skill formation.
- Work is primarily defined as participation in any economically productive activity with or without compensation, wages or profit.

10.6 TERMINAL QUESTIONS

1. Explain the age, sex and associated factors responsible for progressive, regressive and stationary population pyramid.
2. Describe in detail spatio-temporal patterns of Child Sex Ratio in India.
3. Why is it necessary to develop skill amongst youth and working population?
4. Analyse trends and patterns of occupational structure of India.

10.7 ANSWERS

Self-Assessment Question

1. a) Age and sex structure can be graphically illustrated by showing the distribution of various age groups by sex, commonly known as population pyramids.
   b) Progressive Population is observed in a country where increasing birth rate and high death rate is prevalent. As a result of which this demographic trend when plotted in a graph, it produces a wide base and rapidly tapering pyramid. Regressive Population is just opposite. This refers to a situation where declining birth rate and low mortality rate is being observed. This produces a narrow based pyramid.
2. Overall sex ratios get affected by a complex intermixing of factors like Male selective out migration and Differential mortality rates for females.
3. Selective undercount of girls, fewer abortions and retention of male foetuses with improved reproductive health-care facilities and reducing mortality differentials were often cited as the reasons for fewer numbers of girls being born as compared to boys in the population.
4. The dependency ratio is calculated as the ratio of the dependent population to the working population, whichever the way working population is defined. These ratios are presented as number of dependants per 100 persons.

5. With fewer births each year, a country's young dependent population grows smaller in relation to the working-age population. The share of the working age population increases providing for limited time 'a window of opportunity ' for rapid economic growth. This has been termed as the 'demographic dividend';
6. Literacy is considered to be a stock variable. That is to say, it covers the entire literate population, young, adults and old who might have acquired literacy in the past. Gross enrolment ratios which is a flow variable tell us about the contemporary situation in educational attainment.
7. Work is primarily defined as participation in any economically productive activity with or without compensation, wages or profit. Some of the examples of activities which are not considered as work are free collection of fuel, fodder or collection of minor forest products such as edibles, medicinal plants etc.

Terminal Questions

1. Refer to Section 10.2.1
2. Refer to Section 10.2.2 B
3. Refer to Section 10.3
4. Refer to Section 10.4

10.8 REFERENCES AND FURTHER READING

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UNIT 11

HUMAN MIGRATION

Structure

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Expected Learning Outcomes
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11.1 INTRODUCTION

In Unit 9, you have learnt that population growth has three components: birth rate, death rate, and migration. In this unit, our focus will be on human migration. Surely you have come across examples of human migration in your own life. Think about them and write them down in the margin.

In school, you must have read in your Social Sciences text book about the early humans who were basically wanderers. Settled life began during the Neolithic age when human beings started farming. You will read about this in more detail in Block 4 of this course which is on human settlements. Human history has many examples of migration. Several human groups came to India through the ages and settled down here. You have read about this in the unit on peopling of Indian subcontinent far back in time. But relatively in recent times French, Portugese and Parsi people came to India choose to settle down in Pondicherry, Goa and Mumbai. On the other hand, a large number of Indians went as traders to South East Asian Countries such as Indonesia and Malaysia and settled down in those countries. In fact, migration of people has distributed and redistributed populations throughout history. Much of the fascinating diversity of humans on our planet results from the almost constant movement of human beings in search of new places to live.

Thus, human migration is a phenomenon which we need to study in more detail. No doubt migration is a form of mobility. However, it is different from several other forms of mobility. We have defined many other terms such as circulation, commuting, transhumance etc. These terms are often confused with migration. Therefore, we begin this unit by defining migration in Sec. 11.2. We also distinguish between migration and other forms of mobility. In Sec. 11.3, we explain various types of migration. You may like to know why people migrate. We answer this question in Sec. 11.4, which explains factors that cause migration, namely, economic, social, environmental and demographic factors. We discuss the consequences of migration in Sec.11.5. Finally, in Sec. 11.6, we analyse the patterns of international migration both in historical as well as in present day context.

We advise you not to read the unit as a story. As you study each concept, think about what you have learnt. Try to find out similar incidents and situations you have either experienced or read about. If not, then try to look for them while studying this unit. It will help you in understanding the concept of migration in a better way. You will learn in this unit people tend to migrate in search of better opportunities and resources. Therefore, in the next unit, you will study the relationship between population and resources.

Expected Learning Outcomes

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

- define migration and differentiate it from other forms of mobility;
- identify various types of migration and their basis;
- explain determinants of migration;
- outline consequences of migration; and
- analyse spatial patterns of international migration.

11.2 MIGRATION AND MOBILITY

In this section, we will study some definitions of migration. Although migration is also a form of mobility, it is different from many other forms of mobility. Therefore, in this section we will also explain the difference between migration and other forms of mobility.

11.2.1 Definitions of Migration

Social scientists generally agree that:

"Migration is movement of population involving a change of permanent residence of substantial duration".

According to Multi-lingual Demographic Dictionary (p.113):

"The distinguishing characteristic of migration is that it involves a change in usual place of residence and implies movement across an administrative boundary."

If we consider the above mentioned definitions, then ***migrants are those who leave their erstwhile residence and administrative area and move to another residence under a new administrative area.***

According to Census of India***, when a person is enumerated in census at a different place than his / her place of birth, she / he is considered a migrant.***

Migration involves mobility. But, can we term all forms of mobility as migration? The answer is, we cannot. There is a difference between migration and mobility. Mobility is more of a general term. It refers to all types of movements of people. It includes both permanent and temporary movements. While explaining about migration, you should also know that what is not migration? We use terms like **circulation, commuting and transhumance** to indicate various forms of mobility. These terms cannot be categorized as migration in technical sense. Similarly, **refugees and internally displaced persons** are not migrants. Therefore, you must learn the meaning of each of these terms and their difference from migration. We have explained each form of mobility and its meaning with suitable examples in Table 11.1.

Table 11.1: Forms of Mobility and their Meaning

Sr. No.	Forms of Mobility	Meaning
1	**Circulation**	It encompasses a variety of movements that are usually short-term, repetitive or cyclical in character. The common feature of such movement is the lack of any declared intention of a permanent or long lasting change in residence. **Example**: Children leave for school in the morning, stay at day care centre in the afternoon and return home in the evening.
2	**Commuting**	It refers to the movement of individuals from their place of residence to place of work and back daily, weekly or monthly. **Example**: People coming from nearby villages and towns to major cities, namely Mumbai, Delhi, Kolkata, Chennai etc on a daily basis.
3	**Transhumance**	It refers to the seasonal movement of people up and down the hills along with their herds. **Examples**: Gaddis of Himachal Pradesh and Bakarwals of Jammu and Kashmir in India.

4	**Internally Displaced Persons**	These are the individuals or groups compelled to leave their homes to escape from situations like armed conflict, violence, human rights abuse or disaster. As the name suggests, they are residing within their country of nationality. **Example**: Kashmiri Pandits in India
5	**Refugees**	Individuals or groups who, owing to fear of being persecuted for reasons of race, religion, nationality, membership in a particular group or political opinion, are outside the country of nationality and are unable or unwilling to return. **Examples**: Tibetans, Chakmas of Bangladesh, and Tamils of Sri Lanka staying in different parts of India



Fig. 11.1: Forms of Mobility.

You may now like to pause and check whether you have understood the terms related to migration and other forms of mobility.

SAQ 1

a) Identify each form of mobility shown in Fig. 11.1.

b) Which of the following is an example of migration in technical sense?

i) Movement of Raikas to Madhya Pradesh along with their herds

ii) Daily movement of people from Meerut to Delhi for work

iii) Movement of people from Odisha and Bihar to Mumbai in search of job

iv) Household help leaves for work, after working in two to three houses returns back home.

11.3 TYPES OF MIGRATION

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

Migration can be classified into many types on the basis of the origin of migration, time, distance etc. The classifications on various bases are given in Table 11.2.

Table 11.2: Migration – Basis of Classification and Types

Sl. No	Basis	Types of Migration
1.	**Source or Origin**	• Immigration • Emigration
2.	**Choice**	• Forced • Voluntary
3.	**Political and Administrative Territory**	• Internal • International
4.	**Time**	• Seasonal or Temporary • Permanent
5.	**Distance**	• Short • Medium • Long
6.	**Streams**	• Rural – Rural • Rural – Urban • Urban –Rural • Urban - Urban

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

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

These classifications will become far clearer to you, once we discuss each type of migration, in brief:

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

ii) **Forced and Voluntary Migration:** People can either choose to move or be forced to move. When a government forces a large group of people is forced out of a region, usually based on ethnicity or religion, it is known as involuntaryor forced migration. Contrary to this, if person moves out of a region based on his or her choice, it is known as **voluntary** migration. Jews migration from Germany during World war is an example of forced migration. Migration of engineers and doctors from India to USA, Canada and West European countries is an example of voluntary migration.

iii) **Internal and International:** When people migrate within the same country, it is called **internal** migration. When migration involves crossing the boundary of a given country, it is called **international** migration. For example, if a person migrates from Chennai to Mumbai, it is internal migration. On the other hand, it is another person migrates from Chennai to Singapore, it is **international** migration.

iv) **Seasonal or Temporary and Permanent:** The process of migration for a given period of time is known as seasonal or temporary migration. As mentioned above, labour migration from the state of Bihar, Jharkhand, Odisha and Uttar Pradesh to different parts of India is an example of seasonal migration. This seasonal migration is mainly in search of jobs in the agricultural and industrial sectors of states like Punjab, Haryana, Gujarat, Maharashtra etc. On the other

hand, when a person decides to settle permanently in a different place than his/her place of birth, it is permanent migration.

v) **Short, Medium and Long distance Migration:** As the name suggests, this classification is based on distance. We explain below the classification given by the Census of India. It not only involves distance but also certain administrative jurisdiction where the actual distance is not exactly reflected according to its category.

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

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

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

Table 11.3: Definitions of Short, Medium and Long Distance Migration according to Census of India

Type	Definitions
Short Distance	Within the same district but different police station/ local administrative area
Medium Distance	Within the same state but different districts
Long Distance	Between two states within a country or between two different countries.

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

a) Rural - Rural migration;

b) Rural - Urban migration;

c) Urban - Urban migration; and

d) Urban - Rural migration.

SAQ 2

a) Select the correct option from the alternatives in the statements given below

(i) Migration from Imphal to Kolkata in search of better work opportunities is an example of **medium/long distance migration**.

(ii) People fled from Cuba during the communist regime in anticipation of political persecution. This is an example of **forced/ voluntary migration.**

(iii) An Italian migrant living in London is an **emigrant/immigrant** in England.

b) Match the following

Streams of Migration	**Example**
(A) Rural - Rural migration	(i) Migration from Chennai to Mumbai
(B) Rural - Urban migration	(ii) Bhubaneswar to village Chandanpur
(C) Urban - Urban migration	(iii) Village -Samar Gopalpur to Delhi
(D) Urban - Rural migration	(iv) Village Anchery to Village Andoor

11.4 DETERMINANTS OF MIGRATION

Till now we have discussed about the concept and types of migration. In this section, we will discuss about various determinants of migration.

In simple terms, determinants refer to the broad factors or reasons responsible for migration. Why do people migrate? Think about the examples you have studied so far. Try writing down the reasons/factors

why people in those migrated. So you would have noted that a variety of factors can cause migration. These factors can vary from area to area and perhaps from person to person. It has been observed in various research studies that the process of migration is not a simple but a complex phenomenon. But generally we say migration is a two way process. What this means is that there are certain factors which compel an individual to leave the place of residence or source region. Simultaneously, there are certain factors that attract an individual to place of destination. These factors are popularly known as **push** and **pull factors**.

- **Push factors** are those factors which compel an individual to leave the place of residence.
- **Pull factors** are those factors which attract an individual to the place of destination.

Some of the push and pull factors are listed below. The below given factors are only indicative but not exhaustive in nature.

Table 11.4 : Selected Examples of Push and Pull Factors

Factors	Examples of Factors
Push Factors	Lack of employment opportunities, population – resource imbalances, poverty, acquisition of land (specifically agricultural land) for establishing developmental project like industries, construction of roads, bridges, canal, dam etc., unpredictable climate, natural disaster prone areas, marriage, social insecurity, religious intolerance, civil strife, inter-ethnic conflicts, political unrest, war, terrorism, etc.
Pull Factors	Better employment opportunities, discovery of important natural resources, establishment of new industries, higher wages, attractive living conditions, opportunities for economic advancement, peaceful social, political and industrial environment, etc.

The factors which are listed above as push and pull factors can also be classified into four broad categories: economic, social, demographic and environmental factors. In many text books of geography, demography and population studies, you will find the first three factors. In some books, political factor is considered separately from social factors. But, in this unit, we include political factors under the category of social factor. In recent times environmental changes have emerged as a major reason for migration. You might have read or heard about 'environmental refugees'. Therefore, the environmental factors are also considered as determinants or drivers of migration in many texts. We now discuss each factor in detail with a few examples.

11.4.1 Economic Factors

You will agree that economic factors play an important role in the movement of population. The volume and the direction of migration

depend on the economic conditions. For example, in a developing country, the availability of agricultural land and the size of landholdings may induce migration. Farmers with low land holding or landless villagers tend to migrate to other villages or cities to earn their living. The depressed economic conditions of the people and their state of poverty lead to out-migration. The economic prosperity has a high employment potential and leads to in-migration. In developing countries, like India, agricultural development is progressing fast. These factors induce people to migrate to the agriculturally developed areas such as the state of Punjab and Haryana, which have a high demand for labour. This demand for labour is fulfilled by cheap labour from the states of Uttar Pradesh and Bihar. The availability of better means of transport and communication also encourage people to migrate to longer distances. For example, we find labour from Odisha, Bihar in Tamil Nadu and Kerala.

11.4.2 Social Factors

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

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

You might have read in the news paper or might have watched in television about the large scale migration that has taken place in Syria. Do you know the reasons? This is due to outbreak of civil war since 2011. Can you find out examples of similar type of situations that led to migration? Therefore we can say that displacement, or forced migration, many a times triggered by the breakdown of governance structures, political repression or the emergence of violent conflict.

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

11.4.3 Demographic Factors

What do we mean by demographic factor? Yes, demographic factors are those socio-economic characteristics of a population expressed statistically such as age, sex, growth rate, education and income level, occupation etc. Now, can you correlate these factors with migration? Let us analyse some of the demographic factors and their associations with migration.

For example, age of the migrant is an important demographic factor. Young people have a far greater desire to out-migrate than the elderly people. Why do they move? It is due to many factors like employment, education, improving quality of life etc. High rate of natural increase of population is another reason for out-migration. The growth rate of population, among other things, determines the extent of population pressure in a given geographical area. The movement of European population across the Atlantic is an example. This was due to the gap in the potential for economic development. In contemporary India, redistribution of population is partly related to disparities in regional development. As noted earlier, large-scale out-migration from the thickly populated parts of Bihar and east Uttar Pradesh is largely due to the diminishing land resources in the native villages.

11.4.4 Environmental Factors

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

i) **Sudden onset of hazard events**, for example, floods, cyclones, landslides, volcanic eruptions, earthquakes and tsunamis etc.

ii) **Environmental degradation and/or slow onset hazard events**, for example, drought.

iii) **Armed (environmental) conflict/violence**, for example, conflict over shrinking natural resources.

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

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

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

Let us now recapitulate the examples discussed in this section under various factors of migration. If you know more examples then write it down in the side margin.

Table 11.5: Selected Examples of Economic, Social, Demographic and Environmental Factors

Factors	Examples
Economic	low land holding or landlessness, depressed economic conditions, Lack of employment opportunities, opportunities for economic advancement etc
Social	Marriage, socio-economic status, information network, cultural contacts, and desire for social upliftment, breakdown of governance structures, political repression or the emergence of violent conflict, public policies etc.
Demographic	Age, sex, growth rate, education, income level, occupation etc.
Environmental	Natural hazard and disaster namely floods, droughts cyclones, landslides, volcanic eruptions, earthquakes and tsunamis, seal level rise, coastal erosion etc.

You may now like to pause and check whether you have understood various determinants of migration which we have discussed in this section.

SAQ 3

Select the correct option from the alternatives in the statements given below:

i. Migration from Jharkhand to Delhi in search of better work opportunities is an example of **economic/social** factors of migration.

ii. People fled from Cuba during the communist regime in anticipation of political persecution. This is an example of **Social/environmental** factors of migration.

iii. People from Sahel region of Africa migrate to the neighboring countries due severe drought and famine is an example of **economic/ environmental** factors of migration.

iv. Migration of Nursing professionals from Kerala to different parts of India is an example of **demographic/economic** factors of migration.

As mentioned earlier in the unit, that migration is a two way process. Therefore, it brings changes in the source and destination region of migration. The changes may be positive and negative only or both. In the following section we will discuss about these changes as consequences of migration.

11.5 CONSEQUENCES OF MIGRATION

Studying about consequences of migration is equally significant like analyzing determinants of migration. As we have classified determinants of migration into four broad categories, similarly, we have also classified all the consequences in to four categories namely economic, social, demographic and environmental. If we keenly observe, you will find that both the source regions as well as destinations undergo quantitative and qualitative change. By quantitative change we mean that the change in demographic attributes like numbers, density, growth, compositions like age, sex, occupation, literacy etc. Similarly qualitative aspects include adaptation in the new environment, effects on quality of life etc.

11.5.1 Economic Consequences

There are positive as well as negative economic consequences of migrations. Major **positive consequence is t**he remittances sent by migrants to their homes help in the growth of economy of the region. This money is mainly used by the family for repayment of debts, medical treatment, marriages, children's education, purchasing agricultural inputs, construction of houses, etc. Similarly remittances from the Indian migrants staying outside the country are one of the major sources of foreign exchange in India. States such as Punjab, Kerala and Tamil Nadu receive very large amount of money from their family members who stays out of the country. Similar situation happens within the country also. Migration of people from Uttar Pradesh, Bihar, to the rural areas of Punjab, Haryana, has resulted in the success of green revolution and agricultural development in Punjab and Haryana. They also form major workforce in different industries in different parts of the country.

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

i) Unregulated migration to the metropolitan cities of India has caused overcrowding and put severe stress on existing infrastructure. As a result of this, number of population in slums is increasing in major cities like Mumbai, Delhi, Kolkata, Chennai etc.

ii) The under-development gets even worse due to out-migration of skilled and working population. Villages in underdeveloped parts of India are left with old and young age group population or females looking after these dependant family members.

11.5.2 Social Consequences

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

i) Migrants act as agents of social change. The new ideas related to new technologies, family planning, girl's education, etc. get spread from urban to rural areas through them.

ii) Migration also leads to intermixing of people from diverse cultures and results in the evolution of composite culture.

iii) The mind set of people changes.

Like economic consequences, social consequences has some negative side also. Some of the **negative consequences** are as follows:

i) It also causes anonymity, which creates social vacuum and sense of dejection among individuals.

ii) Continued feeling of dejection may motivate people to fall in the trap of antisocial activities like crime and drug abuse.

iii) Migration affects the women more. In the rural areas, male selective out migration leaving their wives behind puts extra physical as well mental pressure on the women which increases their vulnerability.

11.5.3 Demographic Consequences

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

i) Migration leads to the redistribution of the population within a country.

iii) Rural-urban migration is one of the important factors contributing to the population growth of cities.

Some of the **negative consequences** are as follows:

i) It results in imbalances in sex composition due to selective male migration. Large cities have adverse sex ratio as compared to rural areas due to high male immigration.

ii) Rural areas face shortage of skilled people because most of skilled and semi-skilled people migrate to urban areas.

11.5.4 Environmental Consequences

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

i) Overcrowding of people due to rural-urban migration has put pressure on the existing social and physical infrastructure in the urban areas.

ii) This ultimately leads to unplanned growth of urban settlement and formation of slums shanty colonies.

iii) Apart from this, due to over-exploitation of natural resources, cities are facing the acute problem of depletion of ground water, air pollution, and disposal of sewage and management of solid wastes.

Now, let us pause and perform this activity and answer the questions given in SAQ 4. This will give you a fair amount of idea about whether you have understood various consequences of migration which we have discussed in this section.

SAQ 4

Identify the types of consequences described in the below given statements:

i) Tension and conflict between migrant community and native people in a city.

ii) Villagers flee to nearby safer areas due to sea water inundation.

iii) Overall development of a city due to migration of technical manpower and establishment of various professional institution and industries.

iv) Imbalanced working population in the remote villages due to migration of youth adult male members to various cities in search of Job.

Till now we have discussed the terms related to migration and other forms of mobility, types of migration and determinants and consequences of migration. In the following section we will discuss about the spatial patterns emerged out of this migration both historically as well as in present times. We will also briefly describe associated factors responsible for such patterns.

11.6 SPATIAL PATTERNS OF INTERNATIONAL MIGRATION

In India, if you visit Pondicherry, you will find French settlements. Similarly, in Goa you will find descendants of Portuguese. In Mumbai there are thousands of Jews and in Kolkata there is a township known as China Town. Have you ever thought how these people came to India? Why did they come to India? Some of them were explorers and traders. The French and Portuguese established there colonies in some parts while the entire Indian sub-continent remained colony of British Empire for about 200 years. In fact, most of the Europeans travelled to different continents all over the world and established the colonies. Later on they brought mostly Asians and Africans to work as indentured labour in their colonies. That is how population was redistributed all over the world during the day of European imperialism.

In this section, we will discuss about spatial patterns of international migration only. We won't discuss internal migration because it would vary from country to country. As far as internal migration in India is concerned, we will have a detailed discussion about this in the course on Geography of India.

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

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

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

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

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

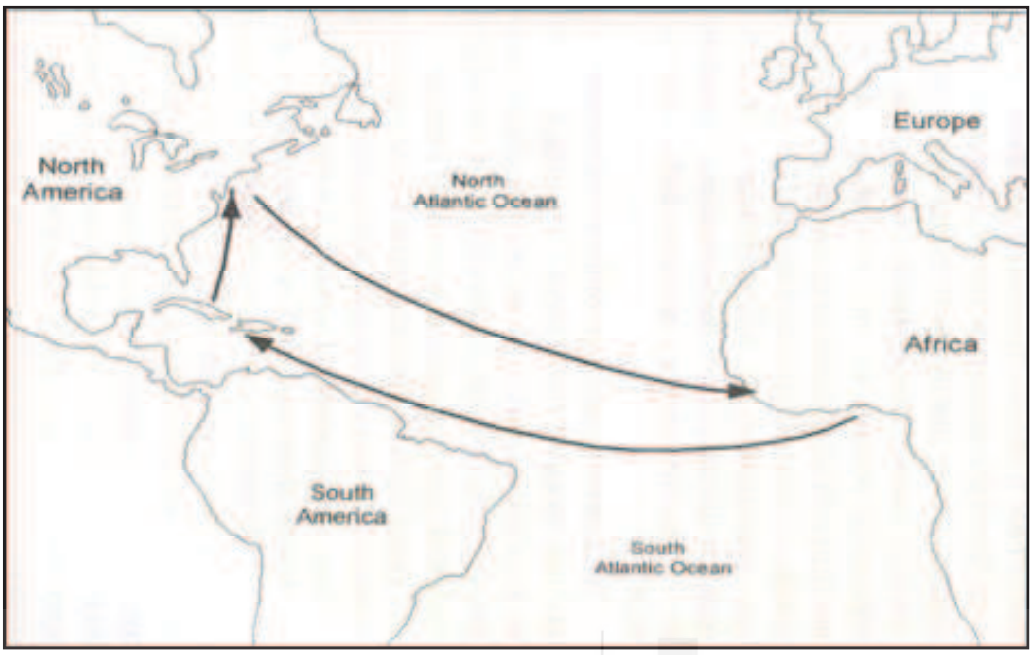


Fig. 11.2: Triangular Slave Trade initiated by the British.

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

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

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

ii) The second stream of migration was by African and Asian generated by European intervention for their colonial interest.

Please refer to the Fig. 11.3 which will help you in understanding spatial patterns of migration during modern times. Can you find out the major streams of migration that was originated from India?

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

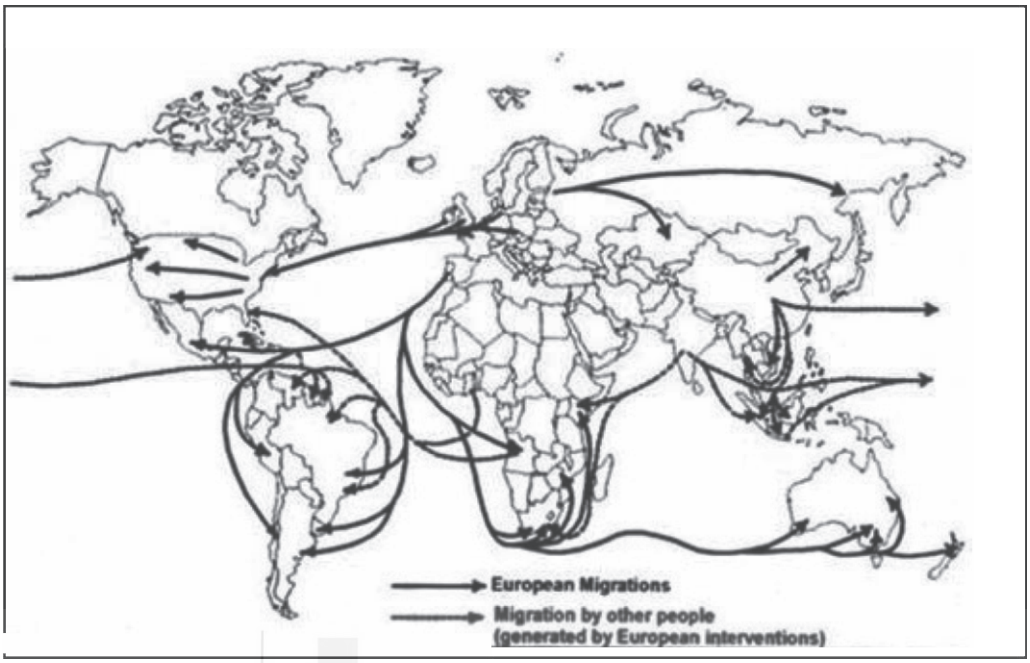


Fig. 11.3: Major Human Migration during Modern Times.

In Asia, many countries got their independence after the end of colonial rule. As you know, India was divided in to two independent nations-India and Pakistan- in the year 1947. During this period, nearly 17 million populations migrated from one part of the sub-continent to another. Similarly, creation of an independent state of Israel in West Asia brought thousands of Israelis from all over the world and thousands of Arab forced to leave the country due to Arab-Israeli conflict.

According to 2013 data provided by Department of Economic and Social Affairs, United Nations, the top ten countries that receive immigrants and send emigrants are given below:

Table 11.6: The Top Ten Countries that Receive Immigrants and send emigrants

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

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

Do you find any pattern? Yes, receiving countries are from developed world representing North America, Europe, Australia and West Asia where as sending countries are mostly from developing world representing South and South East Asia and Central America. The second pattern is Europe, Russian Federation and United Kingdom are the countries which found their place in top ten countries of both the sending and receiving countries.

SAQ 5

a) Name the two streams of migration from Europe that took place during seventeenth century.

b) Explain the 'triangular slave trade'.

11.7 SUMMARY

In this unit, you have studied:

- Migration refers to 'movement of population involving a change of permanent residence of substantial duration'. There is a difference between migration and mobility. Mobility is more of a general term that refers to all types of movements of people. Therefore, circulation, commuting, transhumance are not categorized as migration and refugees and internally displaced person are not categorized as migrant.
- Migration can be classified into many types on the basis of source of origin, choice, political and administrative territory, time, distance, streams of migration etc.
- Migration is a two way processes. There are certain factors which compel an individual to leave the place of residence or source region and simultaneously, there are certain factors that attract an individual to place of destination. These factors are popularly known as push and pull factors.
- The factors which are listed under push and pull factors can also be classified into four broad categories: economic, social, demographic and environmental factors. Similarly, consequences of migration are also classified in to the same four categories.
- As a result of migration, both the source regions as well as destinations undergo quantitative and qualitative change. By quantitative change we mean that the change in demographic attributes like numbers, density, growth, compositions like age, sex, occupation, literacy etc. Similarly qualitative aspects include adaptation in the new environment, effect on quality of life etc.
- International migration can be looked at in two different ways. One is in a simple chronological manner and second way of looking at it is

forced and voluntary migration separately. Major human migration can be grouped under two categories. The first major stream of migration was exclusively by Europeans. The second stream of migration was by African and Asian generated by European intervention for their colonial interest.

11.8 TERMINAL QUESTIONS

1. Define migration. Classify migration into various types and mention their basis. Explain in brief about each type of migration.

2. Explain economic and demographic determinants and consequences of migration with suitable examples.

3. Analyse spatial patterns of international migration that occurred since 17th Century.

11.9 ANSWERS

Self-Assessment Question

1. a) (i) Commuting (ii) Transhumance (iii) Refugee (iv) Circulation

   b) iii

2. a) (i) long distance migration; (ii) forced migration; (iii) immigrant

   b) A- (iv); B- (iii); C- (i); D- (ii)

3. i) economic; (ii) social; (iii) environmental; (iv) demographic

4. i) social; (ii) environmental; (iii) economic (iv) demographic

5. a) First stream of migration was towards the sparsely populated areas of tropical and sub-tropical coastlands which were easily accessible. The second stream of migration was towards sparsely populated temperate grassland areas.

   b) At first stage, British ships carried slaves and gold from Africa to the Caribbean Islands. In the next stage, the same ships carried molasses, sugar and gold coin from the Caribbean to North American colonies. In the last and final stage the ships returned to Africa with iron bars, used as currency in Africa, and rum.

Terminal Questions

1. Refer to Section 11.2 and 11.3
2. Refer to Section 11.4.1 and 11.4.3 for economic and demographic determinants of migration and 11.5.1 and 11.5.3 for respective consequences of migration.
3. Refer to Section 11.6.

11.10 REFERENCES AND FURTHER READING

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Acknowledgements:

Figure 11.1: Various forms of mobility

Source: (a)https://www.hindustantimes.com/mumbai-news/soon-an-app-to-inform-you-about-local-train-disruptions-in-mumbai/story-muKVp07VZAViYwIlhEx0BO.html

(b)https://www.tribuneindia.com/news/gaddi-shepherds-in-dilemma-as-wool-shearers-go-on-strike/656844.html

(c)http://www.internationalaffairs.org.au/australianoutlook/international-community-response-rohingya/

(d) https://pixabay.com/photos/kathmandu-nepal-street-vendor-2383304/

Figure 11.2: Triangular slave trade initiated by the british

Source:http://cdn.yourarticlelibrary.com/wp-content/uploads/2014/11/clip_image00274.jpg

Figure 11.3: Major human migration during modern times

Source:http://cdn.yourarticlelibrary.com/wp-content/uploads/2014/11/clip_image00442.jpg

UNIT 12

POPULATION AND RESOURCES

Structure

12.1 Introduction
Expected Learning Outcomes
12.2 Meaning and Concept of Resource
12.3 Population and Resource
Size of Population
12.4 Population, Resource and Sustainable Development
Population-Resource Relationship
Need for Sustainability and Sustainable Development
12.5 Summary
12.6 Terminal Question
12.7 Answers
12.8 References and Further Reading

12.1 INTRODUCTION

Do you know that every day between dawn and dusk you use innumerable resources without knowing that you are using them? Some of these resources that you are using are for free, like air, while for other resources someone is paying for you, like drinking water, for which your parents might be paying to municipal bodies as water charges. Some of you, especially in the villages may find it unusual that your urban friends are paying for water that you can drink for free from well, tap or directly from the river. You must have seen food being cooked in your houses. Do you remember the source of energy used for cooking at your home? It can vary from dried grass to crop residual to cow-dung cake, to coal, to kerosene stove, to electric heater to gas oven. Do you know that all these sources are called resources and humans have learnt to use them progressively with time? Time is one of the determinants in identifying the resource, as our collective knowledge depends on the time in which we live. Imagine the man of Palaeolithic period; can he consider uranium as a resource? Imagine a much simpler example; can people of your grandparents' generation imagine that humans will have to pay to breathe? Certainly not! The point is that the nature of resources change over time. From the examples above, two things are clear-one that all the gifts of nature that you use are resources. The other is that while some of these resources are free, for others we have to pay.

In this unit, we will discuss about meaning and concept of resources in Section 12.2. In the following section i.e. Section 12.3 we will analyse nature of population change and it's

relationship with natural resources. We will also explain the concept of under population, Over populate and optimums populations. The concluding section justify the need for sustainability and sustainable development.

Expected Learning Outcomes

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

- describe meaning and concept of resources;
- analyse nature of population change and its dynamic relationship with natural resources;
- explain the concepts of under population, over population and optimum population; and
- justify the need for sustainability and sustainable development.

12.2 MEANING AND CONCEPT OF RESOURCE

As you know, all the stuff that human's use in one way or the other is referred to as 'resources'. This means, that the concept of resource is primarily based on the utilitarian value of nature, for the species known as humans. The concept of 'utilitarianism' as propounded by John Stuart Mill talks about the fulfillment of human needs. It is in this background Karl Zimmerman noted that **'resources are not they become**'. Until any neutral stuff is not used by humans, it is not considered as a resource. The stage of being used is largely determined by the level of technology available and accessible to the set of human beings that can put the neutral stuff to use. Let us take the example of fossil fuel. Till the time it was not known that oil could be used as a source of energy, it was not a resource. It was only after the potential of the oil as a source of energy was known, this became a resource. A similar example can be taken in the case of uranium or sea waves which are now being used as resources. An opposite example could be of the storms, which have tremendous amount of energy but are not considered as resource as humans still do not know how to use the energy generated by different kinds of storms. Role of technology remains central to conceptualization of resources. When humans learnt to use stones for the purpose of killing animals to eat, stones became resources used for making arms. Similarly when properties of *quinine* were known, it became resource to be used in pharmaceutical industry to produce medicines for malaria. Research and development therefore play a significant role in defining boundaries of current resources as well as potential resources. Can we deny the role of humans in identifying plants which can be used as staple food grains or pulses? Humans started eating plants much before we came to know the nutritional value of these plants for our health. Similarly, there can be infinite examples of the role of humans in identifying the neutral stuff as resources for the meaningful use of human beings. However, the role of

technology cannot be denied in identifying resources. It can be taken as the collective human wisdom of a particular time that has resulted in the dynamic relationship between humans and nature and role of technology in defining the nature and types of resources.

Resources are anything that satisfies human wants, while anything that can satisfy human wants in future is also put in category of potential resource. Stocks are stores of resources, which are currently unused. Reasons for stocks not being used could be that people are unaware of them (knowledge limitation), don't have the ability to obtain them (technological limitation) or they don't see the need to use them yet (socio-cultural situation). When stocks are translated into resources to satisfy human wants, the region's resource pool generally increases, allowing it to better support its population.

There are generally two types of resources. First, there are natural resources such as oil, gas, minerals and water. Within natural resources, there are renewable resources such as wind, solar energy and hydroelectricity and non-renewable resources such as coal, oil and natural gas. Renewable resources can become non-renewable if over-exploitation occurs. It is not so much the amount of natural resource as the means to tap on these stocks of resources.

Secondly, there are human resources, which is the population. It is important to look at the quality and quantity of human resources. In order to increase aggregate supply and the productive capacity of the economy, it is important to improve the quality of the workforce, increase the size of the workforce or both. Singapore has focused much on supply-side policies such as education and retraining to improve the productivity of their workforce as they have little natural resources.

Resource distribution varies greatly between countries and between regions within countries. Some countries like the USA have high levels of both natural and human resources, others like Mozambique have good natural resources but poor human resources, and countries like Japan, Singapore and Hong Kong have little to none natural resources but high levels of human resource.

Natural resources are those which are obtained directly from nature and can include a range of things like air, water, stone, animals, plants, water and so on. Broadly speaking, scholars have classified resources in different categories or classes on the basis of distinctive characteristics of matter. Natural resources are further classified in 'renewable' and non-renewable'. They are also known as 'fund' and 'flow' resources. 'Fund' resources are known as 'stock' resources that are liable to exhaust one day and therefore put in the category of non-renewable resources like minerals, and fossil fuel. On the other hand resources like sunlight, flowing water, wind, air are resources that are available in all parts of the world with very precarious exception. They therefore are known as renewable resources or also termed as ubiquities. In recent past though the quality of these ubiquities are also changing to the extent that it is not unheard of to find an operational 'oxygen park', where people pay and breath in clean air.

Therefore, the otherwise free resources are becoming chargeable and hence it is difficult to call them ubiquities.

Do you know why such situations have been emerging? This is due to the complex interaction between population and resrources. We will discuss about this in the following section. Before that let us pause and check whether you have understood the concept and classification of resources by performing this small exercise given below.

SAQ 1

a) Describe in brief the meaning of resources.

b) Identify the basis of classification of resources and their types

12.3 POPULATION AND RESOURCE

Let us consider some of the global and local instances which have occurred during last few decades. There have been famines reported from Ethiopia and other African countries. The TFR (Total Fertility Rate) in Ethiopia was reported as 6.7 in 1984 and a simplistic relationship suggests that due to high rise of population there was scarcity of food. There have been deaths from hunger in India too, especially in the states, which are relatively less developed like that of Odisha. The question is that do you think India produces less amount of food and cannot feed its population? You might also ponder over as to whether human population is a resource or a resource user only?

Human population is in a continuous process of change. Population change can be described using words, statistics, and graphs. Two common statistical measures of population change are the Crude Birth rate (CBR) and the Crude Death Rate (CDR). CBR and CDR are usually expressed as the number of births or deaths per 1000 people in a given population, which allows geographers to compare population dynamics in countries with different population sizes. Movement from one region to another is another important factor determining size of human population at regional levels. The movement of human population is incumbent upon distribution of natural resources, level of technological know-how and socio-economic and political processes.

With advancement in economic conditions, the death rate has declined and the world has witnessed a substantially high growth rate of population. In the year 1900, there were approximately 1.6 billion people living on Earth. One hundred years later, the world population totalled just over 6 billion people. The world population is already over 7 billion and is projected to reach about 9 billion before 2050. The increase in the size of the human population in the last half-century is unprecedented. Estimating future demand for food, water and energy – an increasing population will put additional strain on the country's infrastructure and resources, such as healthcare, education etc. This may in turn be used to decide whether or not to implement anti-natal policies.

Humans earn their livelihood by using various means and natural resources found in the natural environment. With the increase in population, the use of means and resources also increases. Further, if we misuse natural resources, the environment gets destroyed. Thus, the balance between population and the environment is also disturbed. If not taken care of it is difficult for the creatures and natural vegetation to survive under such disturbed environment. Various problems such as pollution, soil erosion, and landslide are consequences of the continuous degradation in the environment. As a result, natural calamities such as floods, landslides, excessive rain, drought, etc. increase. The environment is polluted due to wrong activities of humans leading to various kinds of diseases that harm humans and other creatures and make life difficult in general.

The more a population grows the greater resources it will need and the more it will use them. However, there is a limit to this incremental growth, since you cannot keep increasing the use of resources because they themselves are limited. If a population uses all of its resources it is supposed to eventually decrease in number because it cannot live without them. This was the cause, according to certain studies, of the destruction of some populations of the past who lived on isolated islands (which of course have more limited resources). Resources are limited and we have no other planet to move to if we run out of food, water and energy and other resources. The concept in simple is called carrying capacity of the earth. **Carrying capacity** is the population size the environment can sustain indefinitely, given the resources available in the environment, which can change over time due to changes in food availability, water supply and environmental conditions. Contrary to the concept of carrying capacity is the concept of unequal distribution of resources across sections of society. It is relevant to quote Mahatma Gandhi saying **"world has enough to fulfil the needs of all but not enough to fulfil the greed of even one"**. A range of scholars and thinkers since 18th century have deliberated on the relationship between human population and natural resource base of the earth. Probably, it was Thomas Robert Malthus who for the first time gave a systematic analysis of population and resources, followed by Karl Marx, who had a radically different perspective than Malthus.

12.3.1 Size of Population

The increase in population did not occur evenly in different places, nor were the consequences of this growth the same in every place. The reason for this variation lies in the distribution of natural and human resources over the earth surface and the level of technological know-how that allows human population to create new resources and increase the productivity of existing resources. You must be thinking how population can be a resource in itself and at the same time be a problem to resource and quality of resource. Size of population is always measured in different ways of which at least two are very simple. The first is the total population and the second is the number of people per unit area or density of population.

You would have by now a question in your mind that what is an ideal size of population? Is it possible to have uniform population density everywhere on the earth? What would be the factor that would determine the size and density of population in different regions that the earth can support? Is all population growth is bad? And if so, why is it that in most cultures fertility is worshiped in one or the other form? Why some part of the world in the 20th century has shown concerned about population decline? What type of relation exists between resource and population? How with change in technology can sustain more population? The following section is an attempt to answer these questions that have come in your mind.

Concept of optimum population is a dynamic concept. The first beginnings of this concept may be traced to the writings of a German professor, Karl Winkelblech (1810-1865), who while describing population theory and policy, classified nations into three categories according to the size of their population: (1) Under-populated nations; (2) Over-populated nations; and (3) Nations with normal populations, meaning a size favourable to the greatest possible productivity. The other notable contributors to this theory are Dalton, West, Cannan and Robbins. This theory attempts to define an economically ideal size of population for a country. The optimum means the best and the most desirable size of a country's population. Given the natural resources, capital and technical knowledge, the size of population, which maximizes the per capita income, is called the optimum population. In the worlds of Dalton "Optimum population is that which gives the maximum income per head". The optimum population theory is based on three important concepts: i) Under population ii)Over population and iii) Optimum population. Let us discuss all the three concepts briefly.

i) Under Population

If the population of a country is not sufficient to utilize its natural resources efficiently, then the country is said to be under-populated. In this case, an increase in the growth of population will bring into the operation of the law of increasing returns. In case of under-population, more quantity cannot be produced, and so production will suffer. Further, due to the shortage of labour force, specialization is not feasible. In the absence of specialization, economies of large-scale production cannot be reaped.

ii) Over Population

If the population of a country is too big in relation to its natural resources, then the country is said to be over-populated. Over population means that the existing capital and natural resources are shared by more human being than they actually can be based on the normative availability. The dangers of over population are three: Firstly, the existing resources are not sufficient to provide gainful employment to all. Secondly, due to excessive population, the average productivity will fall. The possibility of disguised unemployment is inevitable. Thirdly, the standard of living will be affected.

iii) Optimum Population

Edwin Cannan (1861- 1935), an English Economist, has been given the credit for defining what later came to be known as the concept of

"Optimum Population."A situation where there is maximum utilization of resources available, achieving the highest standard of living overall possible. Cannan used the term "optimum population" as synonymous with the best possible population, and clarified this in the following words, "At any given time, the population which can exist on a given extent of land, consistent with the greatest productiveness of industry at that time, is definite." The concept of optimum population has been interpreted in several ways, "to mean the size of the population which results in the highest per capita income, the highest productivity as measured in different manners, or the highest level of other less well-defined economic indicators, such as economic welfare, level of living, real income and, in some cases, employment."

Optimum is not a fixed and rigid number, but a moving one. Given the amount of natural and capital resources and the state of technology, there will be a definite size of population at which per capita real income is maximum. But the amount of capital, natural resources and the state of technology are subject to changes. When the technology improves or the new resources are discovered, the optimum level of population will also change.

The concept of the economic optimum was considered as being restrictive, and scholars included the total well-being, health, and longevity of a nation, the ideal family size, and the conservation of natural resources, power, defence and other spiritual, cultural and aesthetic factors in considering the size of optimum population. According to most writers, however, the economic optimum was the main consideration in the optimum population theory, and gradually the idea of a population of optimum size for maximum production was accepted. Later developments, however, provoked a critical re-examination of this theory.

This theory has been criticized on several grounds. Several writers have challenged its practical applicability by expressing doubts whether optimum population in the sense of an optimum point can ever be determined. Actually, very few attempts have been made to determine the optimum population of any country. For example, an American demographer put the optimum population size for the United States of America at 120 million. Alfred Survey worked out a figure of between 50 and 75 million for France.

Some, critics of this theory have challenged the very concept of optimum population, which is essentially a static concept. According to these critics, the theory is based on the assumption of a ceteris paribus condition for all other factors such as technology, resources, social structure, external trade, etc. Such an assumption is, of course, highly unrealistic.

SAQ 2

What is under population, over population and optimum population?

12.4 POPULATION, RESOURCE AND SUSTAINABLE DEVELOPMENT

As global population rose spectacularly in the 20th century, theoretical debates over the extent and causes of the population problem expanded. In 1968, as world population hovered above 3 billion, Paul Ehrlich authored the book *The Population Bomb,* a widely read publication that sold several million copies in the United States alone. Ehrlich, a biologist, maintained that the rate of population growth was outstripping agricultural growth and the capacity for renewal of Earth's resources. Given current rates of natural increase, Ehrlich predicted "certain" demographic disaster in response to eventual food shortages and disease. In the opening to his book, he wrote: "The battle to feed all of humanity is over" and later stated that, "In the 1970s and 1980s hundreds of millions of people will starve to death in spite of any crash programs" (Ehrlich 1968). Institutional responses such as the Club of Rome came up with similar theories, like the Meadows Model or the Limits to Growth theory. It was devised in the context of spiralling oil prices in the early 1970s, emphasizing people's dependence on oil and finite resources. Let us discuss the view expressed by Ehrlich on population – resource realationship and their critics.

12.4.1 Population - Resource Relationship

Resources are dependent on technology. It is the level of technology that determine accessibility and quantum of availability of resources to the existing population as a whole. In the 1970s, Julian Simon published two central pieces that served to galvanize the population debate: *The Economics of Population Growth* (1977) followed by *The Ultimate Resource* (1981). Simon argued that the relationship between population growth and economic growth was not as simple as Ehrlich believed, and that the extent to which population pressure impacted resources was overstated. In 1980, Julian Simon and Paul Ehrlich engaged in a very public debate that underscored their disparate standpoints on population and resource scarcity. The debate went on to the extent that Simon invited Ehrlich and his colleagues to select and purchase five non-government controlled resources worth a total of $1000 whose value would be measured over time. Ehrlich's team selected chromium, copper, nickel, tin and tungsten as the commodities and then chose 1990 as the payoff date. This deal meant that if the price of the resource bundle rose, this implied that the resource had become scarcer and Simon therefore would be forced to pay the difference. If the price of the bundle had dropped, this would signify greater abundance, and Simon would receive the monetary difference.

It so happened that between 1980 and 1990, the world's population grew by more than 800 million, the largest increase in one decade, causing many to believe that the value of the bundle would rise due to population pressure and corresponding resource scarcity. Yet in September 1990, the inflation adjusted price of all five metals had fallen, forcing Ehrlich to mail Simon a check for $576.

Ehrlich is credited for developing a simple equation that examines population's relationship to environmental impact. Known as the IPAT equation, the formula I=PAT was introduced by Ehrlich and Holdren in the 1970s. It argued that environmental impacts (I) are the result of three variables: population (P); affluence (A); and technology (T), as follows:

$$I = P \times A \times T$$

It is used to understand some of the factors affecting human impacts on the environment, and originally used to emphasize the role of population growth on the environment.

Population has been increasing exponentially since the Industrial Revolution. An increase in P will result in an increase in I, since a population increase will result in demand for greater land use, resource use and also pollution, ceteris paribus.

Affluence is commonly measured in per capita GDP. An increase in A will increase consumption of goods, which can have a variety of impacts – for example, plastic packaging, Styrofoam, crude oil, rare earth minerals, water etc.

Technology represents how resource intensive the production of affluence is. A reduction in technology can come about via improved methods, efficiency etc, reducing impacts on the environment (alternative energy sources etc.). T is likely to decrease over time as research and development continues.

However, if P increases exponentially, then T needs to decrease at double the rate of population increase. Since P and A have both increased, the impact of a decreasing T has been lessened.

The model remains pessimistic and rooted in Malthusian thinking, and claims that continued population growth will lead to dwindling resources. It believes that economic growth is the major cause of global problems such as environmental destruction and is threat to sustainability.

Ehrlich and Simon were not the only theorists of the 1970s to debate the extent and causes of the population problem, nor were they the last to discuss the merits of possible solutions. Biologist Garrett Hardin, known primarily for his research on common property resources, published "Life Boat Ethics" in 1974. Using a lifeboat as a metaphor for the position of rich, industrialized countries, Hardin questioned the ethics of whether "swimmers" surrounding the lifeboat should be taken aboard (or given aid) in light of the vessel's limited carrying capacity. The partly economic and partly ecological thesis of Hardin reminded the world of the Meadow's theory of 'Limit to Growth' that was based on the carrying capacity of the earth.

12.4.2 Need for Sustainability and Sustainable Development

Sustainable development is meant to meet the needs of the present generation while leaving the same or an improved resource base as a bequest for the future. The needs of future generations are not compromised while satisfying those of the present. Both economic and environmental considerations are to be covered when planning policies. The relationship between human development and environment is two-way process. While the environment contributes to human welfare and well being and provides the essential resources, if in the process of economic progress the environment is damaged, future economic progress will be jeopardized.

It was in this background that in 1987, just a few years after the Ethiopian famine, the Brundtland Report was released by the United Nations. Entitled "Our Common Future", the document lamented the degradation of environmental resources and outlined the effects that such deterioration would have on social and economic growth for world populations. The Brundtland Report, named after the Commission's Chair, Gro Harlem Brundtland, then-Prime Minister of Norway, acknowledged that many environmental issues were global in nature. In recognition of the increased scale of resource problems, the document issued a call for sustainable development. Population pressure, food security, industry and energy – problems inherent to the developed or developing world - were all identified as equally critical challenges to sustainable development. In other words, Africa's rapid population growth rates caused concern for the environment, but so, too, did the demands of energy hungry nations in the West. The report recognized the issues of inter-generational and intra-generational equity and realized that unless the questions of intra-generational equity (like, hunger, poverty) are resolved it would be difficult to address the issues of inter-generational equity (like pollution and degradation). The issue of sustainable development is not simple and over the period of time has faced with multidimensionality and contradictory contextualization. The debates in global context remain centred around 'developed-developing societies' or what is also known as 'North-South' debate. However, these debates do not provide answer on how to use resources, how to contain resource depletion and how to develop efficient mechanism for resource management. To answer these questions, the primary need is to have appraisal of resources including land, water, minerals etc. At different scales, viz. global, national and regional. We need to estimate the quantum of consumption at different levels across regions of the world. One simple measure of resource consumption is known as 'ecological footprint'. The studies across different regions of the world suggest that different societies have different size of ecological footprint. The varying size of ecological footprint means different level of resource consumption and varying stress to the ecosystem. This remains central to the 'North-South' debate related to sustainability.

Box 12.1: Key Concepts related to Sustainable Resource Use

i) **Resource Appraisals** are assessments or estimations of the worth, value, or quality of a resource, meant for the planning and monitoring land use and resource management.

ii) **Resource Depletion** occurs when raw materials within a region are being exhausted, consumed beyond their replacement rate. It can be caused by overpopulation, unsustainable resource extraction methods (slash and burn, deforestation, over-mining for oil and minerals).

iii) **Resource Management** is the efficient deployment of resources when and where they are needed. The data required for effective management include demand for various resources over a time period and the ability for supply to match this demand. Resource management also refers to practices pertaining to maintaining the sustainability and integrity of natural systems and resources.

iv) **Ecological Footprint** is the measure of the impact of human demand for resources on the Earth's ecosystems. It compares human demand with Earth's ecological capacity to regenerate. It is possible to use this to estimate how many planet Earths it would take to sustain humanity given a certain lifestyle (e.g. in 2006 our ecological footprint was estimated at 1.4 Earths, or we use resources 1.4 times as fast as Earth can renew them).

The debate on sustainability may remain inconclusive, but demand for food has increased over two centuries as human population has grown. Food production in different world regions has generally increased though at different rates. There has been much more variability in the rate of population growth from place to place. In countries where populations are growing rapidly, there is some concern that this growth threatens the local availability of resources. Indeed, some scientists warn that the Earth has a carrying capacity that limits the number of people that the environment can support. However, not all scientists share this view. Some point out that the environmental "doomsday" (Malthus, Ehrlich) scenarios that were predicted many decades ago have failed to materialize, others believe the world's poor are the victims of a global economy that distributes power and resources unequally.

Sustainability debate that has close link with increasing resource consumption and significant resource depletion has remained detached with global production cycle. However, the fact remains that unless global consumption is contained, stress on resource is bound to increase, whether due to increase in size of population or due to increasing consumption owing to growing affluence. The de-segregated specific contribution of number and affluence hand in balance and largely is leaned towards affluence, giving more teeth to global south to question 'conservationist' argument. The global North holds the ground of high consumption level using the ownership of sophisticated technology. Over last four decades (since first sustainability conference at Stockholm in 1972), no agreement has reached though there have been rounds of negotiations.

SAQ 3

Explain in brief the following terms:

a) Ecological footprint.

b) Sustainable development.

12.5 SUMMARY

After reading the unit we can sum up that there is difference in relationship between population and resources. At some places, there is abundance of resources, but population uses these resources only to limited extent because they still are at subsistence level of economy. On the contrary, at certain other places, there is concentration of population and they use more resources than they have. They can do so, because they have developed higher technologies that allow them to expand their reach to the regions those house resources, e.g. oil-fields of Alaska, or fishing in high sea of Pacific and Atlantic. Continuous increasing level of resource use and depletion demands sustainable use of the existing resources as they are limited. The issue of sustainability is more in debate than in action.

12.6 TERMINAL QUESTIONS

1. Discuss the context in which need for Sustainable Development was felt.
2. Explain is the concept of 'optimum population'. How far this is a relevant concept in understanding ideal population size of a nation.
3. Differentiate between natural and human resource. describe quatilative and quantitative aspects of human resource.

12.7 ANSWERS

Self-Assessment Question

1. a) Any stuff on the face of earth that is used by human is called resources. In other words, resources are anything that satisfies human wants, while anything that can satisfy human wants in future is also put in category of potential resource.

   b) Resources can be categorized on more than one bases: i) On the basis of availability, like: ubiquities, rarities; ii) On the basis of origin, like: biotic- flora, abiotic –minerals, soil; iii) On the basis of ownership, like: free, chargeable- individual, community, national; iv) On the basis of exhaustibility, like: renewable and non-renewable; v) On the basis of stage of development, like: developed and potential.

2. If the population of a country is not sufficient to utilise it's natural resources efficiently then the country is said to be under populated whereas if the population of a country is too big in relation to its

natural resources then the country is said to be over populated Optimum population is a situation where there is maximum utilisation of resources available, achieving the highest standard of timing over all possible.

3. a) Ecological Footprintis the measure of the impact of human demand for resources on the Earth's ecosystems. It compares human demand with Earth's ecological capacity to regenerate.

   b) Sustainable development is meant to meet the needs of the present generation while leaving the same or an improved resource base for the future generation.

Terminal Questions

1. Refer to Section 12.4.2
2. Refer to Section 12.3.1
3. Refer to Section 12.2

12.8 REFERENCES AND FURTHER READING

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GLOSSARY

Agricultural Density : Agricultural population per unit of cultivated area.

Birth Rate : The ratio between the number of births in a single year and the total population and is expressed as number per thousand.

Carrying Capacity : It is the population size that the environment can sustain indefinitely, given the resource available in the environment.

Death Rate : The ratio between the number of deaths in a single year and the total population, and is expressed as a number per thousand.

Demographic Dividend: The increase in share of working population providing for a limited time 'a window of opportunity' for rapid economic growth.

Demographic Transition Model : This is a model used to represent the process of explaining the transformation of countries from high birth rate and high death rate to low birth rate and low death rate as part of the economic development of a country from a pre-industrial economy to an industrialized economy.

Dependency Ratio : The ratio of the dependent population to the working population. These ratios are presented as number of dependants per 100 persons.

Ecological Footprint : It measure the impact of human demand for resources on the Earth's ecosystems. It compares human demand with Earth's ecological capacity to regenerate.

Emigration : The process of moving out of one's own country to settle in another.

Immigration : The process of moving in to another country where she or he is not a native to take up residence.

Infant Mortality Rate	:	The number of infant deaths per thousand live births in a population during a calendar year.
Literacy	:	Ability to read and write
Natural Growth Rate	:	The difference between birth rate and death rate.
Nutritional or Physiological Density	:	The ratio between the total population and total cultivated area of a particular place. This is expressed as person per square kilometer of cultivated land.
Optimum Population	:	A situation where there is maximum utilization of resources available, achieving the highest standard of living overall possible.
Over Population	:	If the population of a country is too big in relation to its natural resources, then the country is said to be over-populated.
Population Pyramids	:	Age and sex structure graphically illustrated by showing the distribution of various age groups by sex.
Progressive Population Pyramid	:	This is observed where increasing birth rate and high death rate is prevalent. As a result of which this demographic trend when plotted in a graph, it produces a wide base and rapidly tapering pyramid. This gives a concave look to the diagram if we join outermost point of each bar.
Refugees	:	Individuals or groups who, owing to fear of being persecuted for reasons of race, religion, nationality, membership in a particular group or political opinion, are outside the country of nationality and are unable or unwilling to return.
Regressive Population Pyramid	:	A situation where declining birth rate and low mortality rate is being observed. This produces a narrow based pyramid. This gives a convex look to the diagram if we join outermost point of each bar.

Resources : Anything that satisfies human wants.

Sex Ratio : A simple count of the number of males and females for a standard unit of population usually 100 persons. However, in some countries namely India calculate the ratio of female per 1000 males.

Stationary Population Pyramid : Unchanging fertility and mortality rates over a long period of time that produces a regularly tapering pyramid. A stationary population is a special example of a stable population with a zero growth rate.

Stock : Stores of resources which are currently unused.

Transhumance : The seasonal movement of people up and down the hills along with their herds.

Under Population : If the population of a country is not sufficient to utilize its natural resources efficiently, then the country is said to be under-populated.

Work : Participation in any economically productive activity with or without compensation, wages or profit.

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