Indira Gandhi National Open University
School of Sciences

MGG-004

POPULATION AND SETTLEMENT GEOGRAPHY

BLOCK

2

POPULATION DYNAMICS

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MGGET- 004
POPULATION AND SETTLEMENT GEOGRAPHY

BLOCK 2: POPULATION DYNAMICS

Population dynamics refers to the knowledge concerned with the population sizes and the factors involved in their variation namely maintenance, decline, or expansion. Population change has three components namely fertility, mortality and migration. The variation in these three components depends upon various social, economic and demographic factors. Apart from these factors, policies and governance also plays a vital role in population dynamics.

This Block is divided into four Units that deal with the diverse aspects of population dynamics. Let us discuss each unit briefly.

Unit 5: Population Theories

In this unit, we will describe views on population before Malthus. This is followed by a detailed discussion on Malthus theory along with its criticism. A brief analysis of neo-Malthusian views on population is given followed by views of Marx and Boserup . In the concluding section, Demographic Transition Theory is discussed.

Unit 6: Population Dynamics

In this unit, we describe concept, measurements and Trends and patterns of fertility in the world and Indi. In the next section, a detailed discussion on the concept, measurements and trends and patterns of mortality is presented. In the concluding section, the concept, measurements and trends and patterns of international migration is discussed.

Unit 7: Population and Development

In this unit, we describe the relationship between population and development. In the following section we discuss the concepts of Human Development Index and Gender Development Index. In the next two section, we describe spatial patterns of HDI and GDI respectively. This is followed by analysis of population-resource relationship by using two concepts namely Concept of Carrying Capacity and Land – Human Ratio. In the concluding section population-resource region given by Edward Ackerman is presented .

Unit 8: Population Policy

In this unit, we describe the need for population policy. In the next section an attempt has been made to outline the elements of a population policy. In the next section, outlines of selected population policies both from developing and developed world has been discussed. In the final section, a brief discussion on Population Policies in India has been presented.

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

UNIT 5

POPULATION THEORIES

Structure

5.1 INTRODUCTION

Till now you have read in Block 1 about population distribution, growth and composition in the context of the world as well as with special reference to India. We have also discussed development of Population Geography as a sub-discipline in the world and in India in the Unit-1 of Block 1. Apart from development of Population Geography as a sub-discipline, a detailed discussion was made on sources of data. In this block we shall various facets of population dynamics. Before discussing population dynamics, we should have some ideas about theoretical understanding about the population dynamics. Therefore, in this unit, we will discuss various theories, models and views expressed by scholars particularly after the renaissance period in general and since 16th Century in particular.

In this unit, we will describe views on population before Malthus in section 5.2. In the next section i.e. 5.3, a detailed discussion on Malthus theory is presented along with its criticism. In section 5.4, a brief analysis of neo-Malthusian views on population is given followed by views of Marx and Boserup in the section 5.5. In the concluding section i.e. section 5.6, Demographic Transition Theory is discussed. After this unit, you shall have an idea about various theories, model and views expressed by various philosophers, thinkers and social scientists particularly from post-renaissance period to present day.

Expected Learning Outcomes

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

- describe views on population before Malthus;
- analyse the Malthusian theory of population;
- explain Neo-Malthusian and Marxist views on population; and
- discuss in detail Demographic Transition Theory.

5.2 VIEWS ON POPULATION BEFORE MALTHUS

As mentioned in the introduction, the academic discourse on population can be traced back to sixteenth century. If you have read European History, you might know that it was the period during which many revolutionary changes occurred in different facets of the society. That was the period when the Mercantilist School of thought was prevalent. This period is known for the rapid changes which took place in several aspects of human life. The most striking of which were due to the *Renaissance*. All the changes after *renaissance* have far reaching impacts on the thinking related to economy society and population. During this period, there were two prominent economic schools of thought namely Mercantilist and Physiocratic. However, these schools of thought have not discussed anything explicitly on population. Nevertheless, there are references on population in the context of economic development of the country. Let us discuss in brief about the views expressed on population by these two theories.

5.2.1 Mercantilist School

Have you ever heard about Mercantilism? In the history of economic thought, "Mercantilism" is considered to be a link between the medieval period and the modern period. Almost all the trading nations adopted this economic policy of mercantilism with a view to increasing national wealth and power by encouraging exports of goods in return for gold. Such policies often resulted in rivalry between nations, though they gave rise to rapid economic growth and full utilisation of national resources. Such a mercantile policy also implied that these countries had always to be in a state of preparedness and had to keep down the production cost of goods through a great deal of exploitation of labour. Inevitably, such a policy led to inflation. You might be thinking that how this policy is linked to population? For an effective implementation of this mercantile policy, the size of the population was an important asset. Keeping this in mind almost all countries during that period was trying to increase population in their respective country.

According to Mercantilist a nation's wealth consists of precious metals namely gold and silver. If a country did not possess gold or silver mines, it could earn such wealth only by achieving a favourable balance of trade. This can only be achieved by exporting more goods than importing them and thereby adding more gold and silver to its national coffers. Such balance of trade required the production of goods for export. This meant that the importance of industry rather than that of agriculture had to be emphasised. In such a situation, the

demand for workers was bound to increase and, therefore, a sized population was considered to be an essential factor in the economic and political power of a country. Here, again, the number of workers rather than their quality or skill was the main consideration. Sometimes this principle was stretched to such an extent that, in France, even children above the age of six were recruited.

The general opinion related to population at that particular period of time was that birth rates should be increased for various economic and political gains. To achieve this objective the following measures were adopted:

(i) Placing various disabilities on celibates;

(ii) Encouraging marriages directly;

(iii) Encouraging fertility;

(iv) Making punishment for illegitimate births less severe or abolishing such punishment entirely; and

(v) Encouraging immigration and preventing emigration.

Among the early mercantile writers, the most important were Niccolo Machiavelli (1469-1527) and Giovanni Botero (1540-1617). Machiavelli was perhaps the first to view population from the modern perspective, by observing that excessive population would diminish through want and disease. In other words he saw the relationship between population growth and resources. He may be considered as one of the precursors of Malthus.

Giovanni Botero, an Italian citizen, was also one of the first to study population phenomena in a broad scientific manner. Along with Machiavelli, he may be considered one of the precursors of Malthus, as his work contained the basic thoughts of the Malthusian doctrines. He expounded that a population, after increasing for some time, cannot continue to increase at the same rate. It may grow slowly or may even start declining. In his opinion, the limitation of the means of subsistence was the reason why population growth had to be limited. He regarded limited means of subsistence as the primary check to population growth, while the secondary checks were sterility of the soil, bad climate, disease and epidemics. Botero was convinced that food for subsistence was necessary for any population. He was also of the opinion that a large population act as a source of strength for a country.

Another prominent school of thought that expressed views on population apart from Mercantilist school was Physiocratic School of Economic Thought. Let us discuss in brief the views expressed by this school of thought.

5.2.2 Physiocratic School of Economic Thought

Do you know about the evolution and major focus of this school of thought. Let us discuss about this in brief.

It evolved in France about the middle of the eighteenth century. It was considered as the expression of a reaction against the mercantilist ideas and politics. While the mercantilists had neglected agriculture in their enthusiasm for the acquisition of gold and silver through trade in manufactured goods, the

basic assumption of the physiocratic school was **that land was the source of all wealth and hence it was necessary to emphasise the importance of agriculture and internal tax reforms**. As a reaction against the large population centric tenets of the mercantilists, the physiocrats did not favour population increase at the cost of standards of living. They approved of such increase only if it was possible to expand agricultural production.

Quesney (1694-1774) was the founder of the physiocratic school. Like mercantile writers, Quesney was also supported the idea of a large population for a country. However, he was of the opinion that a large population was desirable only if it could be made comfortable. Mirabeau (1715-1789), another French economic thinker, was of the opinion that a larger population would be desirable for the state, but agriculture must be encouraged because this population would have to be fed. Similar views were expressed by Mercier de la Riviere, though he maintained that in a well-administered state, population would not increase faster than the means of subsistence. Cantillon, who is looked upon as a mercantilist in many respects, also shared some of the opinions of the physiocrats. He believed that the size of agricultural production of wealth, would determine the size of the population.

You may now like to pause and check whether you have understood views on population by both schools of thought which we have discussed in this section.

SAQ I

Fill in the blanks with suitable words

(a) Macchiavelli was perhaps the first to view population from the modern perspective by observing that excessive population would diminish through _____ and _____.

(b) Population was considered to be an essential factor in the _____ and _____ power of a country.

(c) _____ was the founder of the physiocratic school.

(d) Cantillon believed that the size of _____ of wealth, would determine the size of the population.

5.3 MALTHUSIAN THEORY

Till now you might have realised that the above mentioned theories are not exclusively population theories. They were basically economic theory having some reference to population in the context of economic development. Malthus theory was the first one which was exclusively on population.

From the middle of the eighteenth century, almost all writings on population contained some reference to the point that population increases more rapidly than food supply, a point which was later to be elaborated by Malthus and which came to be known as the Malthusian Theory of Population. The earlier optimistic view, which regarded a large and growing population as a source of strength and wealth, was replaced by the view that it was undesirable to have a population that was too large in relation to the means of subsistence. This

pessimistic view was based on such considerations as the potential of the reproductive power of human beings, limited land and limited means of subsistence, the tendency of population to grow so rapidly as to create the problem of over-population and the harmful effects of over-population in relation to the means of subsistence. The logical result of such a line of thinking was belief in the benevolent role of the various checks on population growth. The earlier belief that prolific fertility was a patriotic duty gave way to the idea of responsible parenthood for the well-being of the children. Intellectuals started thinking in terms of checks on child-bearing, mainly because of the excess fertility of the poor and the resulting burden imposed on society by the Poor Laws.

Several writers anticipated the doctrines later propounded by Malthus. Botero has already been referred to as his first important forerunner. Writing in 1677, Mathew Hale referred to the capacity of mankind to increase in geometrical proportion, doubling in numbers in the course of thirty-four years or even less. He also referred to corrective checks for controlling human population. Others, writing in the same strain, were: Robert Wallace (1687-1771), John Bruckner (1726-1804), James Steurt (1712-1780), and Joseph Townsend (1739-1816).

This theory was propounded by a British economist Thomas Robert Malthus. He was the first academician who proposed a theory on population. In 1798, Malthus published *An Essay on the Principle of Population*, describing his theory related to growth of human populations. Malthus published six editions of this seminal work between 1798 and 1826. In each edition, he updated the book to incorporate criticism as well as to convey changes in his own perspectives on the subject.

Malthus proposed two hypotheses. These hypotheses were as follows:

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

(ii) Tthe 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 constant effort constantly tends to subject the lower classes of the society to distress and to prevent any great permanent amelioration of their condition.

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 included hunger, disease and war; the preventative checks, 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: Some of the major criticisms of Malthus Theory are as follows:

1. Malthus basic premise on passion between sexes has been questioned on the plea that the desire to have children cannot 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 evidence 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 anywhere 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 criticized for ignoring the role of changing technology and changes in socio-economic set up of a society.

Despite so many criticisms, legacy of Malthus was carried out by a group of thinkers who are popularly known as neo-Malthusian. In the next section, we will discuss neo-Malthusian view on population.

Before that let us pause for while and answer the questions that are given below.

SAQ 2

Mark the below given statements as True and False

a. Positive checks are those checks which raised the death rate whereas preventative checks were those which lowered the birth rate.

b. Population, when unchecked, increases in a geometrical ratio whereas subsistence i.e. production of food substances increases only in an arithmetical ratio.

c. In 1798, Malthus published *An Essay on the Principle of Population*, describing his theory related to growth of human populations.

d. Malthus was not swayed by the supremacy of positive checks like delayed marriage, moral restraints and controlled frequency of sex after marriage.

5.4 VIEWS BY NEO-MALTHUS, MARX AND BOSERUP

Till now you might have understood that though Malthus was the first who give an exclusive theory on population. This theory has initiated a lot of discussion on its applicability and relevance in present day context. This was evident from various debates and discourses by both individual academicians and group of thinkers namely Neo-Malthusian and Marxist. In this section, we will discuss the views of Neo-Malthusian, Marxist and Boserup.

5.4.1 Neo-Malthus

You might think that who are these neo-Malthusians and why are they named so? Neo-Malthusian are those who beliefs Malthus. In other words the neo-Malthusians may be categorized as a group of thinkers and academicians who were essentially agreed with Malthusian proposition but disagreed with his idea on controlling measures. If we trace the evolution of the term or "neo-Malthusianism" this was first used in 1877 by Dr. Samuel Van Houten, one of the vice- presidents of the Malthusian League.

Neo-Malthusian agreed 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. Let us discuss some of the different point of view expressed by neo-Malthusian. However, Neo- Malthusianism was not just a campaign in favour of birth control; it was particular perspective on the effects of population on human conduct and behaviour.

Till now, you have read about the population theory given by Malthus and views expressed by neo-Malthusians. However, Marx and Boserup have never propounded any theory on population. If we analyse their works, we may find some views related to population. In many of their writings both of them were highly critical on Malthusian theory. Let us dis cuss them in brief.

5.4.2 Marx

Marx did not propound any theory of population *per se,* and all one finds in Marx's works on the issue of population are some scattered statement. He was another prominent thinker who opposed the Malthusian theory.

Malthus was of the view that his theory has universal applicability. Marx refuted this claim and argued that the 'eternal laws' of classical economics can be applied to some specific economic systems. Keeping this in view, Marx was of the opinion that there could not be a universal law for population. Rather, he argued that every mode of production has its own specific population principles that are valid only within its limits. The problems of overpopulation and limits to resources, as enunciated by Malthus, are inherent and inevitable features associated with the capitalist system of production. Though differing on many counts from the 'utopian ideas' he agreed that any size of population could be supported by a properly orgnised society.

He merely defined the population principle peculiar to capitalist society characterised by large-scale replacement of labour by machinery. He called this the '**law of relative surplus population'**. Marx's explanation implied that are relative surplus of population associated with the capitalist mode of production would disappear when capitalism is replaced by some kind of a collective mode of production. Marx believed that the surplus product of labour, previously appropriated by the capitalists, would be returned to its natural owners – the workers, thereby eliminating poverty. With rise in income and improvement in standards of living, the death rate would decline. The birth rate would also, in the long run, begin declining with the rise in living standards and the end of the exploitation of children.

Marx argued that what Malthus saw the problem related to the pressure of population on the means of production actually represented the pressure of the means of production on population. Thus he 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.

5.4.3 Boserup

Ester Boserup was a Danish economist. She studied economic and agricultural development from the Copenhagen University. She worked at the United Nations as well as other international organizations, and wrote seminal books on agrarian change and the role of women in development. Boserup is known for her theory of agricultural intensification. Her best-known book on this subject, *The Conditions of Agricultural Growth,* presents a "dynamic analysis embracing all types of primitive agriculture." (Boserup, 1965. p 13). A major point of her book is that "necessity is the mother of invention".

In this book she argued that population growth is the major cause of agricultural change and that the principal mechanism of change is the intensification of land use through increased in the frequency of cropping. She argued that intensification would not occur without population growth, which reduces labour productivity. However, this contentious claim remains unproven. She argued that it is a necessary collective response to population pressure. Furthermore, such intensification leads to technological advances, such as the adoption of new fallowing systems, which require new tools and techniques and which shape institutions, land tenure systems and settlement forms. The theory overturns the direction of causation implicit in Malthusian and neo-Malthusian approaches, which see technological change as an autonomous process including rather than proceeding from population growth. Economists were generally unenthusiastic about Boserup's model but it refocused many modern debates and stimulated further thought on the issue (Giovanni 2001).

Boserup's theory, which posits that population change drives the intensity of agricultural production. Her position countered the Malthusian theory that agricultural methods determine population via limits on food supply. Boserup

argues that population growth is independent of food supply and that population increase is a cause of changes in agriculture.

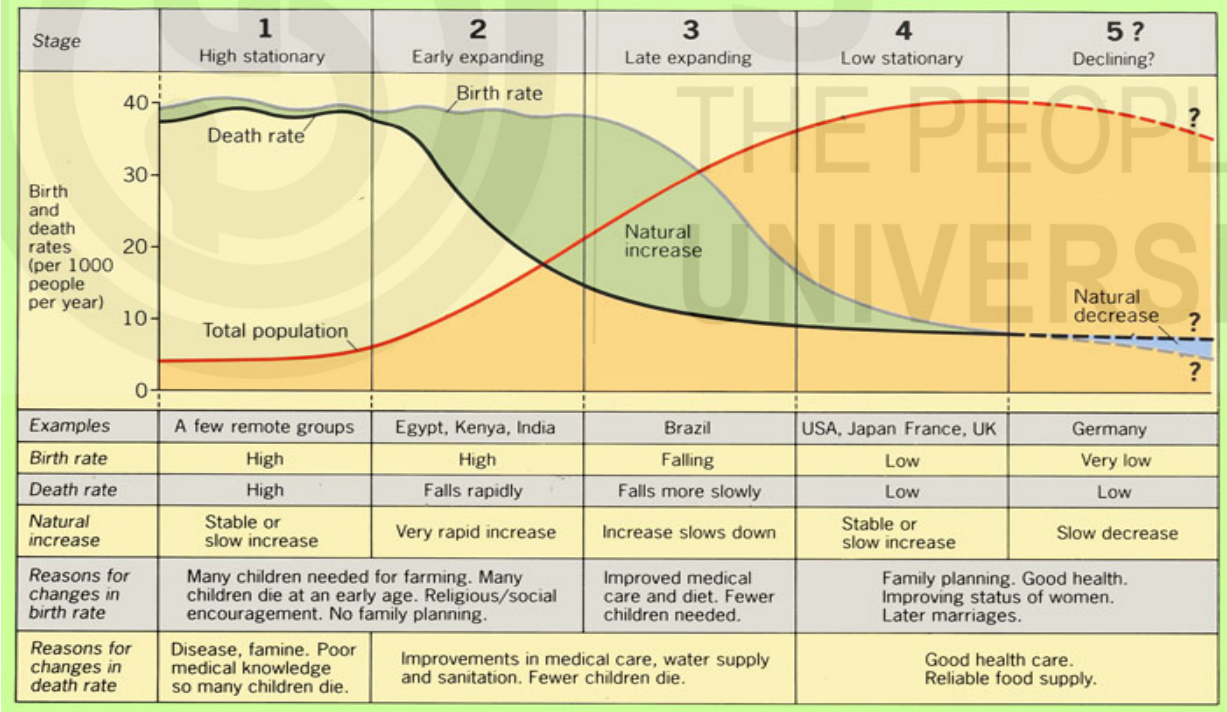
SAQ 3

a) Who are Neo-Malthusians?

b) How Boserup countered Malthusian theory?

5.5 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. 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 industrialized 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 industrialized societies over the past two hundred years. In this model, most of the developed countries are beyond stage three of the model. Majority of the developing countries are either in stage 2 or stage 3. The model was based on the changes seen in Europe. That is why these countries follow the Demographic Transition Model relatively well.



Stage	1 High stationary	2 Early expanding	3 Late expanding	4 Low stationary	5 ? Declining?
Examples	A few remote groups	Egypt, Kenya, India	Brazil	USA, Japan France, UK	Germany
Birth rate	High	High	Falling	Low	Very low
Death rate	High	Falls rapidly	Falls more slowly	Low	Low
Natural increase	Stable or slow increase	Very rapid increase	Increase slows down	Stable or slow increase	Slow decrease
Reasons for changes in birth rate	Many children needed for farming. Many children die at an early age. Religious/social encouragement. No family planning.		Improved medical care and diet. Fewer children needed.	Family planning. Good health. Improving status of women. Later marriages.	
Reasons for changes in death rate	Disease, famine. Poor medical knowledge so many children die.	Improvements in medical care, water supply and sanitation. Fewer children die.		Good health care. Reliable food supply.	

Fig. 5.4: 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 deindustrialization. These five stages are as follows:

1. **The high stationary stage** – It represents high birth rates and high death rates.

2. **The early expanding stage** – It represents steady decline in birth rate and rapidly declining death rate.
3. **The late expanding stage** – It represents steady decline in birth rate and rapidly declining death rate.
4. **The low stationary stage** - It represents low birth rate and low death rate
5. **The declining stage** – It represents low birth rate and low death rate (death rate exceeding the birthrate).

Let us discuss the above mentioned five stages in detail.

1. **The High Stationary Stage**: This is the first stage. It represents pre-industrial society where death rates and birth rates are high. As a result of which the growth rate is balanced and therefore either there is almost no growth or negligible growth. Can you suggest name of any country or region that can be grouped under stage 1?
2. **The Early Expanding Stage**: This is the second stage which 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. Do you think which countries are still in stage 2?
3. **The Late Expanding Stage**: This is the third stage. In this stage birth rates fall due to access to contraception, increases in wages, urbanization, 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.
4. **The Low Stationary Stage**: This is the fourth stage. During this stage both birth rates and death rates are low. 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 obesity and an aging population in developed countries.
5. **The Declining Stage**: This is the fifth and final stage. As mentioned in the beginning of the section that the original DTM 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 deindustrialization. United Kingdom is the earliest nation universally recognized as reaching this Stage. Other countries such as 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.

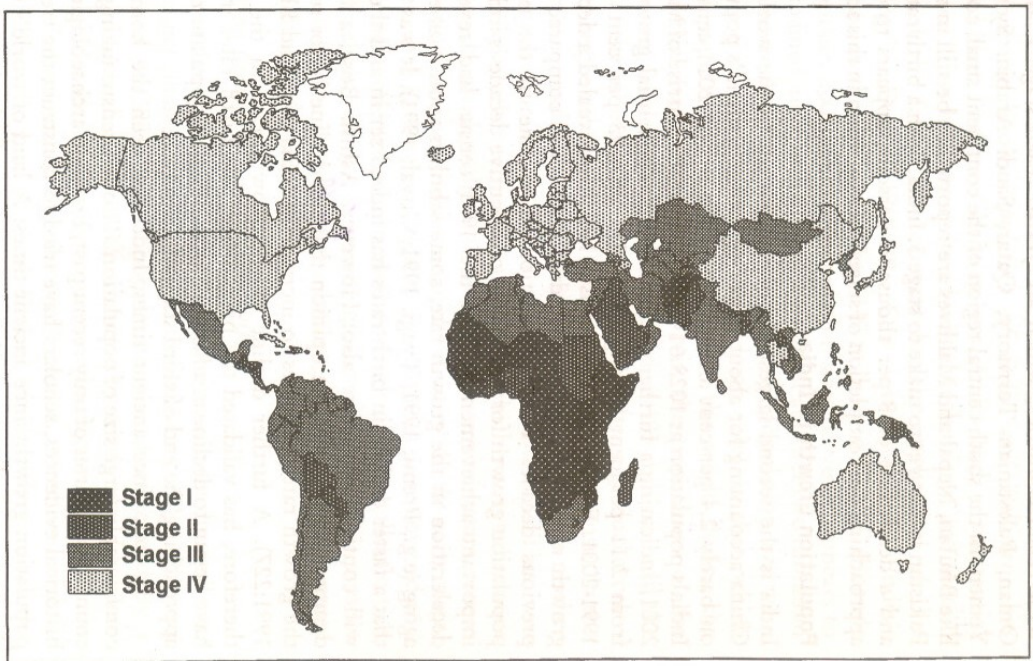


Fig. 5.5: Countries Grouped according to stages reached in demographic transition.
(Source: World Population Data Sheet, 2003, PRB)

Critical Evaluation

Like all models, this is also an idealized picture of population change. Therefore, we should remember that the DTM 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. Most particularly, of course, the DTM makes no comment on change in population due to migration. Some of the major criticism about the model:

1. **Non-applicability to less-developed countries**: DTM has a questionable applicability to developing countries, where information access is limited. For example, the DTM has been validated primarily in Europe and North America where demographic data exists over centuries, whereas high quality demographic data for most developing countries did not become widely available until the mid 20th century. DTM does not account for recent phenomena such as AIDS. HIV has become the leading source of mortality in these areas.

2. **Generalization from European experience:** The DTM is mostly applicable for European countries in general. It also contained a hypothesis that other countries would follow suit. The DTM 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**: DTM assumes 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. DTM assumes 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.

You may now like to pause and check whether you have understood the Demographic Transition Theory which we have discussed in this section.

SAQ 4

Match the Column

Stages		Characteristics
(a)	The High Stationary	(i) Low birth rate and low death rate (death rate is higher than birth rate)
(b)	The Expanding	(ii) High birth rate and low death rate
(c)	The Low Stationary	(iii) High birth rate and high death rate
(d)	The Declining	(iv) Low birth rate and low death rate

5.6 SUMMARY

In this Unit, you have learnt the following:

- Before Malthus, there were two prominent economic schools of thought namely Mercantilist and Physiocratic. However these schools of thought have not discussed anything explicitly on population but there are references on population in the context of economic development of the country.
- Mercantilist school of thought was of the opinion that birth rates should be increased for various economic and political gains. To achieve this objective the following measures were adopted namely (i) placing various disabilities on celibates; (ii) encouraging marriages directly; (iii) encouraging fertility; (iv) making punishment for illegitimate births less severe or abolishing such punishment entirely; and (v) encouraging immigration and preventing emigration.
- The basic assumption of the physiocratic school was that land was the source of all wealth and hence it was necessary to emphasise the importance of agriculture and internal tax reforms. As a reaction against the large population centric tenets of the mercantilists, the physiocrats did not favour population increase at the cost of standards of living. They approved of such increase only if it was possible to expand agricultural production.
- In 1798, Malthus published *An Essay on the Principle of Population*, describing his theory related to growth of human populations. Malthus proposed two hypotheses. These hypotheses were: (i) Food is necessary to 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) Population, when unchecked, increases in a geometrical ratio whereas subsistence i.e. production of food substances increases only in an arithmetical ratio; and (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 constant effort constantly tends to subject the lower classes of the society to distress and to prevent any great permanent amelioration of their condition.
- Neo-Malthusian are those who beliefs Malthus. In other words the neo-Malthusians may be categorized as a group of thinkers and academicians who were essentially agreed with Malthusian proposition but disagreed with his idea on controlling measures.
- Marx refuted the universal applicability of Malthusian Theory and argued that the 'eternal laws' of classical economics can be applied to some specific economic systems. Keeping this in view, Marx was of the opinion that there could not be a universal law for population. He merely defined the population principle peculiar to capitalist society characterised by large-scale replacement of labour by machinery. He called this the 'law of relative surplus population'.
- Boserup's theory, which posits that population change drives the intensity of agricultural production. Her position countered the Malthusian theory that agricultural methods determine population via limits on food supply. Boserup argues that population growth is independent of food supply and that population increase is a cause of changes in agriculture.
- The Demographic transition model (DTM) 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 industrialized 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 industrialized 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 DTM relatively well.

5.7 TERMINAL QUESTIONS

1. Describe prevalent views on population during the pre-Malthus period.
2. Explain Malthusian Theory of Population along with its criticism.
3. Who are neo-Malthusians? Highlight the difference of opinions expressed by neo-Malthusians.
4. Discuss Marx and Boserup's views on population.
5. Critically evaluate the Demographic Transition Model.

5.8 ANSWERS

Self-Assessment Questions (SAQ)

1. (a) want, disease; (b) economic, political; (c) Quesney; (d) agricultural production
2. (a) –True; (b)-False; (c)-True; (d)-False
3. (a) The neo-Malthusians may be categorized as a group of thinkers and academicians who were essentially agreed with Malthusian proposition but disagreed with his idea on controlling measures.

   (b)Boserup countered the Malthusian theory that agricultural methods determine population via limits on food supply.
4. (a)-iii; (b)-ii; (c)-Iv; (d)-i

Terminal Questions

1. Refer to Section 5.2.
2. Refer to Section 5.3.
3. Refer to Section 5.4.
4. Refer to Section 5.5.
5. Refer to Section 5.6.

5.9 REFERENCES AND FURTHER SUGGESTED READING

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UNIT 6

POPULATION DYNAMICS

Structure

6.1 INTRODUCTION

In the previous unit, we have discussed population theories developed during three different period namely pre-Malthus, Malthus and post-Malthus. We have also discussed Demographic Transition Model given by Notestein and Thompson. This model explained the transition from high birth rate and death rate to low birth rate and death rate. In this unit we will deliberate on population dynamics. Do you know what does population dynamics mean? It has two words. Dynamics refers to the phenomena which is changing in nature. Population in our case refers to human population. We have already studied in Block 1 that population change has three components namely fertility, mortality and migration. Fertility and fertility control have got more attention than the other two components of population change in population polices, particularly in developing countries.

In this unit, we will describe concept, measurements and Trends and patterns in the world and India in section 6.2. In the next section i.e. 6.3, a detailed discussion on the concept, measurements and trends and patterns of nuptiality is presented. In section 6.4, a brief analysis of the concept, measurements and Trends and patterns of mortality is given. In the concluding section i.e. section 6.5, the concept, measurements and trends and patterns of migration is discussed.

Expected Learning Outcomes

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

- Describe concept, determinants and spatial patterns of fertility in the World and India;
- Discuss concept, determinants and spatial patterns of mortality in the World and India; and
- Explain concept, determinants and spatial patterns of migration in the World and India.

6.2 POPULATION DYNAMICS

In simpler terms it refers to the knowledge concerned with the population sizes and the factors involved in their variation namely maintenance, decline, or expansion. Population size is defined as the number of people living in a geographical space, changes over time. The temporal change in population size can either positive or negative depending on the changing scenario of birth, death and migration. A positive population growth means that the number of people is increasing, while a negative population growth means that the number of people is decreasing. Zero population growth (ZPG) is a condition of demographic balance when there is no change in the amount of people in a given time. While population growth refers to increase and decrease in population size, population dynamics is the study of how and why populations change in size and structure over time. Therefore, the dynamics of population can be understood in terms of changes in three components of population- Birth, death, and population movements in and out of the geographical area. These three components of population change are in a way controlled by population size, age structure, sex ratio and a host of other factors.

The process of population dynamics can be best examined with the help of an equation, which is known as basic demographic equation. The equation can be written as:

$P_t = P_o + (B-D) + (IM-OM)$

P_t represents population of present time

P_o represents population of base year

B represents number of births during P_t and P_o

D represents number of deaths during P_t and P_o

IM represents number of in-migrants during P_t and P_o

OM represents number of out-migrants during P_t and P_o

As per the basic demographic equation, an area can gain population only through births and in-migration, and can lose population only through deaths and out-migration. Birth and death are two important vital events of life. Whereas mortality is unavoidable, fertility can be controlled by altering a wide range of social, economic, and physiological factors. The difference between number of births and deaths in any particular area is known as natural

increase. Natural increase plays crucial role in population change in close societies where in/out migration is minimal. In such societies population grows if number of births is more than the number of deaths and population declines when the death outnumbers births. In societies open to free flow of population, both natural increase and migration influence population change. Migrational change will lead to population increase when the number of people entering to an area exceeds the number leaving. On the other hand, where departures exceed arrivals, there will be net loss of people. Thus, the total population of an area and the trends in total population over time are the outcome of the interaction of these two components of change. This is always a sort of dynamic equilibrium between them. Geographers most frequently analyse population change through these three components. The magnitude these three demographic events vary widely among regions.

6.2 FERTILITY

As discussed above, fertility is one of the three components of population change. Fertility and fertility control have got more attention than other two components of population change in population polices, particularly in developing countries. India was the first country to have an official family planning programme. Consequently, many developing countries adopted national programmes for fertility control in 1960s and 1970s. Even current population policies of developing countries give fertility reduction a prominent place.

6.2.1 Concept

Fertility refers to the actual reproductive performance, whereas fecundity refers to the physiological capacity of a woman, man, or couple to reproduce (United Nations Population Branch, 1958: 38). In simple words, the term fertility denotes the occurrence of live births among a defined population. In demography, the meaning of reproduction is considered to be different from fertility and fecundity. Reproduction refers to the degree to which people within a given age are replaced by people of the same age, a generation later.

Geographical works on fertility have so far focussed on identifying, portraying, and explaining variations in fertility at different spatial levels through cartographic and statistical methods. However, geographers can contribute more to fertility studies in four important perspectives. The spread of fertility knowledge, attitude and practices from developed places spatially can be studied by using spatial diffusion theory. Second, the concept of distance-decay can be applied to understand the variable use of available services at family planning clinics/health centres. Third, the idea of regional culture based on the French regional geography tradition, can be helpful in understanding patterns of leads and lags, and convergence and divergence in contraceptive use and fertility outcomes. Finally, regionally disaggregated data can be used to analyse the changing relationship between development and fertility.

6.2.2 Measurements

There are several measures of fertility; all of them relate the number of live births to a specific population base and time reference period. It is important to

note that all fertility measures include live births; still births are not taken into consideration. A live birth is defined as 'the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as the beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached, each product of such a birth is considered live born" (United Nations Statistical Office, 1955:6). If a product of conception has not shown any sign of life, it is known as still birth.

Measurement of fertility poses serious problems. First, data on birth tend to be incomplete and inaccurate. Sometimes, people do not conceal illegitimate births and suppress female births. Many a times, people fail to distinguish live and still births. Nevertheless, demographers have devised different measures of fertility which are explained in the following sections. It is worth mentioning here is that the analysis of fertility is carried out in two perspectives-Period Perspective and Cohort Perspective. In cohort perspective, the births are analysed for well defined cohorts. Cohort implies a group of people with similar experiences at the same time. On the other hand, the period perspective deals with the analysis of births that occur in a given period of time. Generally used period measures of fertility are Crude Birth Rate, General Fertility Rate, Age-specific Fertility Rate, Total Fertility Rate, Child Woman Ratio. Let us discuss some of these measures in brief.

(i) Crude Birth Rate: The Crude Birth Rate (CBR) is defined as the number of live births in a given year divided by the number of people in the population in the middle of that year.

$$CBR = (B/P) \times K$$

Where B is the number of births, D is the Mid-year population), and K is the constant which is generally used as 1000

Most annual rates including the birth rate, relate demographic events to the population at mid- year (July 1), which is considered to be the average population at risk of the event occurring during the year. For Example, In India, the crude birth rate was 19.7 in 2019; this means that 18 babies were born for every 1000 people in the country over a one-year period. As per the latest data, the highest CBRs are in Sub-Saharan Africa, and the lowest are in Europe.

CBR is the simplest, but in many ways the least satisfactory measure of fertility. This is the simplest measure because it can be easily calculated and comprehended. It can be quite effective in depicting both general differences and changes in population growth. As the name suggests, the assessment of fertility through this measure is crude one, and its limitations become quite serious when it comes to comparing fertility levels in different societies or regions. The most important drawback is that the CBR does not take into account the age and sex structure of the population. It takes total population into account while all population are not necessarily in reproductive spans (15-49 years). As age and sex structure varies, CBR loses its value for purpose of comparison.

(ii) General Fertility Rate: The frequency of child birth varies with age of the parents, particularly females. It is rare for a child to be born to a woman less than 15 or more than 50 years old. Therefore, the General Fertility Rate (also called the fertility rate) is defined as the number of births per one thousand women in reproductive age (generally 15-44 age group) in a given year.

General Fertility Rate (GFR) is expressed as under

$GFR= B/P_{f\,15\text{-}44} \times 1000$

B stands for the number of births while D stands for the number of women ages 15-44

The GFR is a more refined measure than the CBR as it relates births to only women in the child bearing age group (15-49). This helps in eliminating distortions that might arise because of different age and sex distributions among populations. Though the purpose of the GFR is to restrict the denominator to potential mothers, but it is still not restrictive enough. GFR may be further refined by taking age factor into account.

It is to be noted birth rate for married as well as unmarried women can be calculated depending on the availability of segregated data for married and unmarried women. For Example, the General Marital Fertility Rate (GMFR) in a given year is defined as the number of births for 1000 married females in their childbearing years. The only distinction between GFR and GMFR is the inclusion of the number of married women rather than all the women in the denominator. Therefore, GMFR will always be higher than GFR. Similarly, in developed countries, population scientists attempt to calculate legitimate and illegitimate fertility rates for deeper demographic analysis.

(iii) Age Specific Fertility Rate: Within the age range of 15-49, there are marked differences in the fertility of women of various ages. For this reason, it is customary to calculate fertility rates for each age or age group, as in the following formula:

$ASFR= B_x/ P_{f\,x}$

Where,

ASFR represents Age Specific Fertility Rate**,** B_x is the number of births to women in a given age group and $P_{f\,x}$ is the number of women in the same age group. For example, ASFR for the age group 25-29 will be expressed as $ASFR= B_{25\text{-}29}/ P_{f\,25\text{-}29.}$

Typically, the age specific rates are low or moderate in the 15-19 age group, highest in the 20s, and then decline to the moderate levels for women in their 30s. Rates after age 39 are usually low. ASFRs typical take mountain-shaped patterns, generally skewed to the left.

This measure is very useful to compare mortality rate at different ages or at the same age over time in a geographical area. As fertility varies greatly by caste, class, ethnic groups and religion, cross-sectional analysis of ASFRs will be useful in analysing the socioeconomic patterning of fertility. Comparisons also can be made between geographical areas.

(iv) Child-Woman Ratio/Fertility Ratio: This is one of the simplest measures of fertility which can be calculated by taking into account only the females in reproductive age groups in the denominator and number of children below five years of age in the numerator. Thus, it is expressed in terms of number of children below five years of age per thousand females of reproductive age group (15-49).

Child-Women Ratio/Fertility Ratio = P_{0-4}/ $P_{f\ 15-49}$ x 1000, where P_{0-4} stands for number of children below five years of age, Pf_{15-49} stands for females of reproductive age group 15-49.

As the numerator only includes only the survivors of births of five consecutive years, it is not a convenient measure to compare populations/areas with substantially different levels of infant and child mortality.

(v) Total Fertility Rate (TFR): TFR is based on the age-specific fertility rates of women in their "child-bearing years", which in conventional international statistical usage is ages 15–44 or 15–49. The TFR is, therefore, a measure of the fertility of an imaginary woman who passes through her reproductive life subject to all the age-specific fertility rates for ages 15–49 that were recorded for a given population in a given year.

Thus, TFR= Sum of ASFRs

The TFR represents the average number of children a woman would potentially have, were she to fast-forward through all her childbearing years in a single year, under all the age-specific fertility rates for that year. In other words, this rate is the number of children a woman would have if she was subject to prevailing fertility rates at all ages from a single given year, and survives throughout all her childbearing years.

In a given population, If TFR is 2.0, this indicates that on an average a woman has two children in her lifetime. If the TFR is above 2.1, it means that the woman on average has above replacement fertility, allowing the population to grow via fertility 2.1. According to the United Nations' population division, countries experiencing below-replacement fertility — lower than 2.1 children per woman — indicates that a generation is not producing enough children to replace itself, eventually leading to an outright reduction in population.

(vi) Reproduction Rate (RR): Reproduction means the conditions under which population of one generation is replaced. This is measured through two measures-Gross Reproduction Rate and Net Reproduction Rate. Both of them are summary measures of period fertility rate. Remember in the calculation of these rates, only age-specific fertility rates for female live births (not male births) are taken into consideration as they actually give birth to the children.

Gross Reproduction Rate (GFR) means the average number of daughters that would be born alive to a woman (or group of women) during her lifetime if she passed through her childbearing years (15-49) conforming to the age-specific fertility rates of a given period/year. The relationship between GFR and TFR can be expressed as:

GFR= TFR× (1/1+S), Where S stands for sex ratio at birth

Net Reproduction Rate is the average number of daughters a woman (or a cohort of women) would have at the end of their reproductive age span if they were subjected to the fertility rates and the mortality rates of a given period/year. If the net reproduction rate is less than one, the daughter's generation is smaller than the mother's generation and the mother's generation has not reproduced itself. As the deaths of mothers are not taken into consideration in the calculation of GRR, the estimates for GRR will always be higher than the NRR.

(vii) Children Ever Born: The number of children a woman has ever borne, a cohort measure of fertility. This measure is useful only if the age group of women considered as specified. When this measure is calculated for women ages 45 to 49, it is called the completed fertility rate: it shows how many children a certain age cohort of women who have completed child bearing actually produced during their child bearing years. For example, in 2006, the number of children ever born to women ages 45 to 49 averaged 7.8 in Niger and, in 2007, 1.8 in Ukraine.

6.2.3 Trends and Patterns: World and India

The Total Fertility Rate (TFR) as a standardised measure, used as the best indicator of fertility for inter-country comparison. According to the United Nations report on 'World Fertility and Family Planning, 2020', the global TFR declined from 3.2 live births per woman in 1990 to 2.5 in 2019. However, the level of fertility rate and pace of its decline varies greatly from region to region. Along with socioeconomic development, fertility markedly changed in each world region. Most of the developed countries of the world have already experienced 'fertility transition'-a drop in fertility from a high level to a low level. For Example, in Australia, New Zealand, Europe and Northern America, TFR had already dropped below 2.0 live births per woman in 1990. As per the latest data, TFR in Europe and Northern America stood at 1.7 in 2019. The corresponding figure for Australia and New Zealand clubbed together is 1.8. Fertility has even fallen so rapidly in the developing world that many poorer countries have achieved a TFR lower than the replacement level (TFR<2.1). During 1990-2019, TFR in Eastern and South Eastern Asia fell from 2.5 to 1.8. Over the same period, TFR in Latin America and the Caribbean, fell from 3.3 to 2.0. On the other hand, in Sub-Saharan Africa, the region with the highest fertility, TFR fell though at a slower pace, from 6.3 in 1990 to 4.6 in 2019. Similarly, fertility levels also declined in Northern Africa and Western Asia (from 4.4 to 2.9) and in Central and Southern Asia (4.3 to 2.4).

World Bank data reveal that African countries have very high level of fertility with Niger having highest TFR (6.9) in 2020. All countries with TFR figure more than 5 belong to African continent. On the other hand, TFR of 1 or less is recorded in Korean Republic (0.8), followed by Hongkong SAR, China (0.9), Puerto Rico (0.9), and British Virgin Islands (1). In most of the developed countries, TFR varies between 1 and 2. Among five populous countries of the world, Pakistan's TFR is much above the replacement level as well the level in rest four countries-China (1.28), India (2.05), USA (1.63) and Indonesia (2.19). This clearly reflects the regional heterogeneities in levels and trends in fertility at the global level. In fact, within region/country differences are glaring too.

India with declining fertility also reflects regional heterogeneities in the level of fertility and pace of its decline. According to the National Family Health Survey (NFHS), the Indian version of global Demographic Health Survey (DHS), India's TFR declined from 3.4 in 1992-93 (NFHS -1) to 2.0 in 2020-21 (NFHS 5). This means India's fertility has fallen below the replacement level fertility. However, this aggregate figure conceals the differences within the country. As per the latest round (NFHS 5) conducted during 2019-21, the TFR is above replacement level in only four states-Bihar (2.98), Uttar Pradesh (2.35), Jharkhand (2.26) and Manipur (2.17). On the other hand, lowest TFR is observed in Sikkim (1.05). Goa (1.3), Ladakh (1.31), Chandigarh (1.40), Jammu and Kashmir (1.41), Lakshadweep (1.42) and Puducherry (1.49) have very low level of TFR. In rest of the states and Union Territories, TFR varies between 1.50 and 2.00. The state level data clearly reflects that the TFR has been declined in all regions of the country and most importantly, it has fallen below the replacement level in all states and Union Territories except Bihar, Uttar Pradesh, Jharkhand and Manipur.

Data suggest that most parts of the world have experienced a fertility decline. Though fertility decline is believed to be a positive sign for economic development, a sustained TFR lower than the replacement level in many countries would have adverse social and economic consequences. For Example, Japan with a TFR of 1.3 are experiencing socioeconomic problems like labour shortage. Therefore, adapting to continued low fertility will become an overriding policy concern in developed countries.

SAQ I

Fill in the blanks with suitable words

a) _____ is the simplest, but in many ways the least satisfactory measure of fertility.

b) Gross Reproduction Rate and Net Reproduction Rate are summary measures of _____.

c) _____ as a standardised measure, used as the best indicator of fertility for inter-country comparison.

d) Adapting to continue low fertility will become an overriding policy concern in _____ countries.

6.3 MORTALITY

Like fertility, mortality is another major component of population change. In this section, we will discuss the on the concept and measurements of mortality. We will also discuss the trends and patterns of mortality both in the world as well as in India.

6.3.1 Concept

The word mortality' comes from Latin root mortis or 'death'. Mortality, therefore can be simply defined as the occurrence of death. The United Nations (UN)

and the World Health Organisation (WHO) have defined death as 'the permanent disappearance of all evidence of life at any time after birth has taken place (post-natal cessation of vital functions without capacity of resuscitation)'. A death can thus occur only after a live birth and the span between birth and death is known as life. Any death prior to a live birth is not considered as a death. Thus, abortions and still births are referred to, not as deaths, but as foetal deaths.

The study of mortality deals with the effects of death on population. Historically, mortality has played a dominant role in determining the growth of population. The increase in the population of European countries following the industrial revolution in the late eighteenth and nineteenth century was mainly due to decline in death rates. The developing countries have also been affected by the fall in death rates in the latter half of the twentieth century.

The level of mortality during early childhood is regarded as one of the best indicators of development. Realising this, the international community has been setting targets for mortality reduction since 1990. The World Summit for children in 1990 set the goal of reducing under five mortality by one-third, or to below 70 per thousand, between 1990 and 2000. The 1994 ICPD reiterated this goal, but set the additional longer-term target of reducing under-five mortality by two-thirds between 1990 and 2015. The Millennium Summit in 2000 then adopted a set of eight development goals, of which the fourth included a target of reducing under-five mortality by two-thirds between 1990 and 2015. One of the targets of Goal 3 of the Sustainable Development Goal (SDG) mission is 'to end, by 2030, preventable deaths of new-borns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 deaths per 1,000 live births and under-5 mortality to at least as low as 25 deaths per 1,000 live births. Similarly, reduction of the global maternal mortality ratio to less than 70 per 100,000 live births is yet another target of Goal 3 of sustainable development mission.

6.3.2 Measurements

Mortality analysis starts with the availability of good quality data on deaths. These data are largely obtained from the population census, vital registration system, health surveys and hospital records. In India, the decennial census, the National Family Health Survey, the Sample Registration System and the medical certification of causes of death provides data on various aspects of mortality. Available data on deaths can be expressed in meaningful ways for comparison of mortality situation between population and regions.

(i) Crude Death Rate: The most common and widely measure of mortality is the crude death rate. The crude death rate is calculated by dividing the number of deaths in a calendar year in an area by the mid-year population for the same year. The rate is generally expressed as per 1,000 population. In simple words, the CDR is expressed as the number of deaths per 1000 mid-year population in a year in a define area.

Crude Death rate (CDR) = (D/P) ×1000

D stands for number of deaths

P stands for total mid-year population

It is relatively easy to compute CDR as it requires data on only population size and the total number of deaths. However, this is a crude measure of mortality as it does not take age and sex structure of the population into account. That means it does not give any clue regarding age and sex patterns of mortality while in reality, the chance of dying greatly vary by age and gender. Therefore, the use of CDR should be avoided while comparing different countries with dissimilar population structure.

(ii) Age-specific Death Rate: The age at which death takes place is a crucial aspect of mortality analysis. The Age-specific Death Rate (ASDR) is used to calculate the mortality level in a defined age group. As it takes age structure into account, this is a better measure of mortality than the CDR. Age-specific death rate is calculated in the following manner:

$ASDR = (D_x/P_x) \times 1000$

D_x is the Number of deaths at a given age, P_x is the number of population at the same age and 1000 is used as a constant.

For example, ASDR for the age group can be expressed as

$ASDR = D_{25\text{-}29}/ P_{20\text{-}24}$

ASDR can be calculated separated for male and female population. The graph showing ASDRs usually takes the form of a U-shaped curve where infant and old mortality rates are high.

(iii) Infant Mortality Rate: The Infant Mortality Rate (IMR) is generally used as one of the best indicators for comparing health status among countries. IMR has been described as 'perhaps the most sensitive barometer of the fitness of the social environment for human life' (Lewis Mumford). In simple words, IMR is expressed as the number of infants dying before completing the first years of life per thousand live-births.

$IMR = (D_0/B) \times 1000$

D_0 stands for the number of deaths among children < 1 year of age reported during a given time period, B denotes the number of live births reported during the same time period and 1000 is used as a constant.

Despite advances in medical science and improvement in standard of living, infant mortality rates in the world over usually exceed the mortality rates for all age groups. IMR in developing countries is often several times higher than the crude birth rate.

Infant mortality is further grouped into neonatal mortality and postneonata mortality based on the time of death in the first year of life. Deaths occurred before 28 days of birth are referred to as neonatal mortality while postnatal mortality refers to the deaths occurred after the 28 days but before 365 days of life. Like IMR, number of live births is included as the denominator in the calculation of both neonatal mortality and postneonata mortality rates.

(iv) Still Birth Ratio: While still births are not included in fertility analysis, this can be a good measure of foetal death. Still Birth Ratio (SBR) is the number of still births per thousand live births

SBR = (SB/B) ×1000

SB stands for the number of still births reported during a given time period in an area, B denotes the number of live births reported during the same time period and 1000 is used as a constant.

(v) Maternal Mortality Ratio/Rate: The World Health Organisation defines maternal mortality as the death of a woman from pregnancy related causes during pregnancy or within 42 days of pregnancy. The International Classification of Diseases Revision 10 (ICD-10) defines a maternal death as follows: 'A maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes'. The level of maternal mortality reflects the state of mother's and children's health in a region. There are two measures of maternal mortality-Maternal Mortality Ratio (MMR) and the Maternal Mortality Rate (MM Rate).

The Maternal Mortality Ratio (MMR) is the number of maternal deaths per 100,000 live births during a definite time period. In the calculation of MMR, number of live births rather than the pregnancies is used in the denominators. Hence it is regarded as a measure of obstetric risk, roughly the risk of dying per 100000 risky events.

MMR= (MD/B) ×100000

MD is the number of maternal deaths and B is the numbers of live births

The Maternal Mortality Rate (MMRate) is the number of maternal deaths in an area per 1000 women of reproductive age (Usually ages 15-49).

MMRate = $(MD/P_f) \times 100000$

MD is the number of maternal deaths and P_f is the Number of women in reproductive age group

Maternal mortality rate is basically a cause specific death rate as this is concerned with pregnancy and delivery related causes.

(vi) Cause Specific Death Rate: The cause-specific death rate is the mortality rate from a specified cause for a population. The cause of death can be a specific disease (e.g., cancer) or phenomenon (e.g., accident). It is the number of deaths from a specified cause in a defined population for a specified time. The numerator is the number of deaths attributed to a specific cause. The denominator should ideally be person years exposed to the specified cause. Because of the complexity in the calculation of person years exposed to the specified risk, mid-year population can be used in the denominator.

CSDR = $(D_s/P) \times K$

D_s is the number of deaths occurred due to a specified cause, P is the mid-year population at risk and K is the constant; the value of K is generally taken as 100 or 100,000.

Hence, this can be expressed as the number of deaths from a specified cause in an area per 100,000 person-years at risk in a given population for a given period.

(vii) Life Expectancy

Life expectancy or longevity at different ages indicate the prevailing mortality conditions. This can be calculated for a population at different ages through life table which involves a well-defined methodology.

Life tables are concerned with the effects of present mortality rates on the future age and sex composition of population. They involve following a hypothetical generation of births throughout life, subjecting it to varying mortality rates at different ages and plotting the number of survivors at each age. Life expectancy simply denotes average length of life at different ages. For example, life expectancy at birth means an average year a newly born baby would survive under the prevailing mortality conditions.

6.3.3 Trends and Patterns: World and India

It is beyond doubt that mortality as measured by many indicators varies from region to region. Among all measures of mortality, the Infant Mortality Rate (IMR) as measured as number of infant deaths per 1000 live births, is widely used as the best indicator of socioeconomic progress. According to United Nations estimates published in the 2021 report of 'The State of World Children', 4 million infant deaths occurred in 2018 globally, which accounts for about 75 percent of all under-five deaths. As far as IMR is concerned, the rate has declined from 65 in 1990 to 29 in 2018 (United Nations, 2021). Table 1 clearly shows that the IMR has declined in all major regions of the world with conspicuous variations in its pace of decline.

Table 6.1: Trends of Infant Mortality Rate in major Regions of the World, 1990-2018

Major Areas	1990	2018
East Asia and Pacific	43	12
Europe and Central Asia	25	07
Eastern Europe and Central Asia	37	10
Western Europe	9	3
Latin America and Caribbean	43	14
Middle East and North Africa	50	18
North America	9	5
South Asia	92	33
Sub-Saharan Africa	107	52
Eastern and Southern Africa	99	39
West and Central Africa	114	63
Least Developed countries	108	45
World	65	28

(Source: The State of World's Children, 2021 report)

Table 6.2: Infant Mortality Rate in Selected Countries, 2018.

15 Countries with Highest IMR	15 Countries with Lowest IMR
Central African Republic (81)	San Marino (1)
Sierra Leone (81)	Iceland (2)
Nigeria (74)	Slovenia (2)
Somalia (74)	Japan (2)
Chad (69)	Cyprus (2)
Lesotho (68)	Estonia (2)
Democratic Republic of Congo (66)	Finland (2)
Guinea (64)	Norway (2)
South Sudan (62)	Montenegro (2)
Liberia (62)	Singapore (2)
Equatorial Guinea (60)	Sweden (2)
Mali (60)	Luxembourg (2)
Benin (59)	Belarus (2)
Cote d'Ivoire (59)	Monaco (3)
Pakistan (56)	Czechia (3)

(Source: The State of World's Children, 2021 report)

Most importantly, a great deal of variation is observed in terms of current level of infant mortality. In 2018, the IMR figures for Western Europe, North America and Europe including Central Asia stood at 03, 05 and 07 respectively. The figure is substantially low in East Asia and Pacific (12) too. On the other hand, a very high level of IMR is observed in Sub-Saharan Africa (52), followed by South Asia (33). Evidence clearly reflects an inverse relationship between level of development and the infant mortality rate. On an average, the infant mortality rate in least developed countries is 45 while the global average is 28. Country level data provided in table 2 reveal that the IMR figure is highest in the Central African Republic (81). In fact, among 15 countries with highest IMR, all countries except Pakistan belong to African continent. On the other hand, San Marino, a small country in Europe has the lowest IMR (01). An IMR of 2 is observed in Japan, Singapore and the Scandinavian countries such as Iceland, Finland, Norway and Sweden. Though IMR has declined noticeably in developing countries, the current level is high.

According to the National Family Health Survey (NFHS), India's IMR declined from 79 infant deaths per 1000 live births in 1992-93 (NFHS -1) to 35 infant deaths per 1000 live births in 2020-21 (NFHS 5). However, disaggregated figures reveal a wide difference by states. As per the latest round (NFHS 5) conducted during 2019-21, among all states and Union Territories, the highest and lowest IMR figures were recorded in Uttar Pradesh (50.4) and Puducherry (2.9) respectively. Along with Uttar Pradesh (50.4), in states such as Bihar (46.8), Chhattisgarh (44.2), Madhya Pradesh (41.3), Jharkhand (37.9) and Odisha (36.3), the infant mortality rate is above the national average (35.2). Apart from Puduchchery, the states and UTs with IMR below 20 are Kerala (4.4), Goa (5.6), Sikkim (11.2), Tamilnadu (18.6), Arunachal Pradesh (12.9) and Jammu & Kashmir (16.3). The IMR for Ladakh is 20. In rest of the states and UTs, the IMR varies between 20 and 35.

SAQ 3

Q. Match the following

(a)	Number of deaths per 1000 mid-year population in a year in a define area	(i) Maternal Mortality Ratio
(b)	Number of deaths before completing the first years of life per thousand live-births	(ii) Crude Death Rate
(c)	Number of maternal deaths per 100,000 live births during a definite time period	(iii) Cause Specific Death Rate
(d)	Number of deaths from a specified cause in a defined population for a specified time	(iv) Infant Mortality Rate

6.4 MIGRATION

People reside on earth's surface right from birth to death. However, they are not static living organisms like plants. They move from one place to another for variety of reasons. In this section, we will discuss the third and very important aspects of population dynamics i.e. migration. Like other sections we will discuss concept, measurements, trends and patterns of migration in the world as well as in India.

6.4.1 Concept

All sorts of these geographical movements are conceptualised as spatial mobility which should not be used synonymously with the concept of social mobility, a term used to denote changes in socio-economic status. Further, spatial mobility and migration have different meanings altogether. Commutation, seasonal movements of workers, and circulation are different forms of spatial mobility. These forms of spatial mobility are temporary, short-term, or cyclical in character and involve the movement of people without intention of a permanent or long-lasting changes in residence.

A change in location of a person's residence is termed as spatial mobility. Migrant is a person who has changed his/her residence from one geographically well-defined area to another area with the intention of permanently or semi permanently settling at the new place. The UN Migration Agency (IOM) defines a migrant as any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence, regardless of (1) the person's legal status; (2) whether the movement is voluntary or involuntary; (3) what the causes for the movement are; or (4) what the length of the stay is. The movement of persons away from their place of usual residence, either across an international border or within a State. Therefore, migration is defined as the movement of people from one area to another with the intention of settling there permanently or semi permanently. Existing models/theories, such as the Push-Pull model of Lee, Ravenstein's Laws of migration, Stouffer's theory of intervening opportunities, and Zelensky's mobility transition model have tried to theorise different aspects of migration.

Understanding of patterns, determinants and consequences of migration is largely dependent on the quality of data available and the way it is measured. National census is the only reliable source of migration data as it covers whole population. The most detailed and comprehensive migration data are usually available in the countries, such as the Netherlands, Japan, Sweden, and Norway which maintain population registers. However, large scale sample surveys conducted in different countries do provide data on some aspects of migration. In India, the Census of India and the Sample Registration System provide migration data for research and planning.

6.4.2 Typologies

There are several bases of classification of migration. To distinguish migration within the country from the cross-border migration, two terms are generally used-Internal and International. Internal migration is a migration that takes place within the borders of a country or territory while migration is international when it refers to changes in habitual residence between countries. In the case of international migration, the entry of a person or a group into a country is known of Immigration, while departure from a country is known as Emigration. The equivalent terms in the case of internal migration are in-migration and out-migration. Migrants who cross international boundaries are referred to as emigrants in the country of origin and immigrants in the country of destination.

According to the reasons, migration can be classified as Work migration, family migration, forced Migration, Refugees, Environmental migration etc. People involved in the same migration form a migration stream. On this basis streams of migration, four streams are generally used in migration study- Rural to rural, rural to urban, urban to urban and Urban to Rural. The terms such as lifetime migration, old migration, recent migration are used to denote the duration of migration. Many other typologies used in migration research are Seasonal migration, Circular migration, temporary migration, and definitive Migration.

Causes of Migration

People think very carefully before making the decision to migrate. The decision is likely to be a combination of:

Push Factors – Push factors are the negative aspects of the place from where people want to leave. In fact, these factors force people to think of leaving their usual place of residence. These factors might include low salary, lack of job opportunities, war, conflict, environmental problems and other socio-economic and cultural issues.

Pull Factors – Pull factors are the positive sides or attractions of the place people decide to move to. These might just be perceived or they might include opportunities in education and employment, better housing and infrastructure, social factors.

Every place has a set of both push factors and pull factors. Generally speaking, push and pull factors fall into four categories- physical/environmental, economic, Socio-cultural and political. Places where pull factors are stronger enough to attract people receive in-migrants while

predominance of push factors leads to outmigration. Therefore, developing countries, at global level, are the place of origin of the migrants.

Apart from the factors associated with the place of origin and place of destination, the decision to migrate rests with the individual. The decision to migrate, many a times, depends on the information field, which is defined as the quantity and quality of the information which a person possess about potential destinations. The information field of the individuals is believed to be followed a distance-decay principle, that means the possession of the quantity and quality of information lessens with increasing distance from the place of residence. This hypothesis is gradually losing its relevance with increasing access to internet and other mode of telecommunications.

Lee (1966) revised the simple push and pull model by introducing personal factors and intervening obstacles. Therefore, Lee's model envisages the importance of four related set of factors of migration-(1) the attributes of the source region; (2) the attributes of the area of destination; (3) intervening obstacles such as international boundaries, discouraging environmental factors, costs of moving; and (4) personal factors, such age, sex, marital status, and social-economic status.

Ravenstein's inverse distance Law states that most migrants travel short distances and the number of migrants decrease with increasing the distance. Put differently it states that 'the volume of migration is inversely proportional to distance travelled by the migrants. The results coming out of this law, if plotted on arithmetic scale will yield a reverse J-shaped curve. As his ideas are based on the Newton's law of gravitation, Ravenstein's inverse distance Law is also known as Gravity model of migration.

Stouffer, an American sociologist, proposed his idea in the form of the theory of intervening opportunities in 1960, which states that the volume of migration between two places at a given distance is directly proportional to the number of opportunities between the place of origin and place of destination.

Zelinsky's mobility transition model in which he describes the migration characteristics of each of his proposed five stages of modernisation process-pre-modern traditional society, early transitional society, late transitional society, advanced society and future super advanced society.

6.4.3 Measurements

Commonly used measures of migration are gross rate of in-migration, gross rate of out-migration, crude net migration rate, gross migration rate, migration effectiveness, migration ratio and contribution of net migration.

(i) Gross Migration Rate: Gross migration includes all immigrants, emigrants, in-migrants and out-migrants. This is calculated in the following manner:

$GMR = (GM/P) \times 1000$

Where GM and P represent gross migration and mid-year population respectively.

Gross In-migration Rate: This is expressed as under

$G_iMR = (IM/P) \times 1000$

Where G_iMR stands for, IM is the total number of inmigrants in an area during a year and P represents mid-year population.

Gross Out-migration Rate: This is expressed as under

$G_oMR = (OM/P) \times 1000$

Where G_oMR symbolises Gross Out-migration Rate, OM is the total number of inmigrants in an area during a year and P represents mid-year population.

(ii) Crude Net Migration Rate: The difference in the volume of in-migration and out-migration as experienced by a particular area is called as net migration and hence, crude net migration rate is expressed as the volume of net migration per 1000 mid-year population.

(ii) Migration Effectiveness: This is expressed as under

$ME = (NMR/GMR) \times 100$

Where ME stands for Migration effectiveness, NMR is the net migration rate and GMR is the gross migration rate. When migration effectiveness is 100 percent, if an area experiences only in-migration and no out-migration.

(iii) Immigration Rate: The immigration rate is the number of immigrants arriving at a destination per 1,000 population at that destination in a given period. Emigration Rate: This is the number of emigrants departing an area of origin per 1,000 population at that area of origin in a given year.

(iv) Net Migration Rate: The net migration rate shows the net effect of immigration and emigration on an area's population, expressed as an increase or decrease per 1,000 population of the area in a given year.

Net migration during an inter-censal period may be calculated as:

$NM = (P_{t+n} – P_t) – (B_n\text{-}D_n)$

Where is the net migration during inter-censal period n; P_t and P_{t+n} are the total populations at two successive censuses; B_n and D_n are the total births and deaths during the inter-censal period.

6.4.4 Trends and Patterns: World and India

Migration has a long history. According to a report of the National Geographic magazine, 'the earliest migrants were ancient humans who originated in the African continent. Their spread to Eurasia and elsewhere remains a matter of significant scientific controversy' (Blakemore, 2019). Nevertheless, the "out of Africa" theory posits that around 60,000 years ago, *Homo sapiens* dispersed across Eurasia. However, the 'Great Atlantic Migration' which took place from Europe to North America is regarded as the largest migration in the history, the first major wave of which started in the 1840s from Ireland and Germany. Though migration is influenced by a host of environmental factors like climate, physiography, food availability, it has long been characterized and complicated by war, enslavement, and persecution. For example, one of the

greatest migrations in human history occurred between India and Pakistan in 1947 and it was because of partition of these two countries. The current pattern of international migration has greatly been influenced by uneven development and the global processes like globalisation.

To understand the current global patterns of migration, the volume of immigration and emigration can be used. Net migration, which is the difference between the number of immigrants and emigrants shows if a region is gaining or losing in terms of population due to migration. According to report titled 'World Population Prospects 2019: Highlights', in Europe and Northern America which are regarded as the centres of international trade, the number of immigrants exceeded the number of emigrants by 25.9 million during 2010-20 (Table 3). The corresponding figure for Northern Africa and Western Asia is 2.2 million and Australia and New Zealand putting together is (1.9 million). The remaining five regions have been net senders of international migrants, where the number of emigrants exceeds the number of immigrants. According to the report, 'for most regions, the absolute populations gains or losses due to international migration were smaller in 2010-20 than in the previous decade (United Nations, 2019:33).

It is estimated that ten countries have experienced a net outflow of more than 1 million migrants between 2010-20. Among these, emigration from Bangladesh (net outflow of -4.2 million), Nepal (-1.8 million) and the Philippines (-1.2 million) was caused primarily because of temporary labour movements while the causes of emigration from Syria (-7.5 million), Venezuela (-3.7 million) and Myanmar (-1.3 million) were insecurity, crisis and conflict. Between 2010 and 2020, a net inflow of more than 1 million people was observed in 14 countries all of which were classified as high-income or upper-middle income countries.

Table 6.3: Net Migration in major Regions of the world during 2010-20

Major Areas	2010-20
Sub-Saharan Africa	-4.1 million
Northern Africa and Western Asia	2.2 million
Central and South Asia	-15.1 million
Eastern and South Eastern Asia	-5.2 million
Latin America and Caribbean	-5.4 million
Australia/New Zealand	1.9 million
Oceania excluding Australia/New Zealand	-208,000
Europe and Northern America	25.9 million

(Source: World Population Prospects 2019.)

India has a long history of international migration. During the period following abolition of slavery in 1833, The United Kingdom relocated millions of bonded Indian workers to colonies across Africa, Asia, and the Caribbean. Later, India-Pakistan partition prompted the movement of millions of migrants throughout South Asia. More recently, globalisation has helped Indians to migrate abroad and the Middle East and Western countries have emerged as the most sought destinations for Indians abroad. Employment and education are the drivers of emigration from India. Migration from the northern India is largely made up of semi-skilled and unskilled laborers, whereas migrants from

southern states, particularly Kerala and Tamil Nadu tend to be skilled and have higher educational levels. India is also a country which houses 4.9 million foreign nationals, particularly South Asia (Singh, 2022).

SAQ 3

Define migrant as given by IOM

6.5 SUMMARY

In this Unit, you have learnt the following:

- Population dynamics refers to the knowledge concerned with the population sizes and the factors involved in their variation namely maintenance, decline, or expansion. Population size is defined as the number of people living in a geographical space, changes over time.
- Fertility refers to the actual reproductive performance, whereas fecundity refers to the physiological capacity of a woman, man, or couple to reproduce
- The word mortality' comes from Latin root mortis or 'death'. Mortality, therefore can be simply defined as the occurrence of death. The United Nations (UN) and the World Health Organisation (WHO) have defined death as 'the permanent disappearance of all evidence of life at any time after birth has taken place
- A change in location of a person's residence is termed as spatial mobility. Migrant is a person who has changed his/her residence from one geographically well-defined area to another area with the intention of permanently or semi permanently settling at the new place.

6.6 TERMINAL QUESTIONS

1. Describe trends and patterns of fertility in the world and India
2. Explain the concept and measurement of mortality.
3. Discuss concept, types and causes of migration

6.7 ANSWERS

Self-Assessment Questions (SAQ)

1. a) Crude Birth Rate; b) period fertility rate; c) Total Fertility Rate; d) developed
2. a-ii; b-iv; c-i; d-iii
3. A migrant as any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence, regardless of (1) the person's legal status; (2) whether the

movement is voluntary or involuntary; (3) what the causes for the movement are; or (4) what the length of the stay is.

Terminal Questions

1. Refer to Section 6.2.3
2. Refer to Section 6.3
3. Refer to Section 6.4.1 and 6.4.2

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UNIT 7

POPULATION AND DEVELOPMENT

Structure

7.1 INTRODUCTION

In the previous unit, you have studied about population dynamics. There are three major components of population dynamics namely fertility, mortality and migration. Under each components, concepts, measurements, trends and patterns in the world and India was discussed in detail. Till now, you must have also realized that population size and growth of any place is the outcome of behavior of these three components of population dynamics namely birth rate, death rate and migration.

In this unit, we will describe the relationship between population and development in the section 7.2. In the section 7.3, we shall discuss the concepts of Human Development and construction and measurements of Human Development Index (HDI) and Gender Development Index (GDI). In the next two sections i.e. 7.4 and 7.5 we shall describe spatial patterns of HDI and GDI respectively. In the concluding section i.e. 7.6 we will analyse population-resource relationship by using two concepts namely Concept of Carrying Capacity and Land – Human Ratio. In this section we will also discuss population-resource relationship though population-resource region given by Edward Ackerman.

Expected Learning Outcomes

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

- describe population and development relationship;
- explain the concept of human development and gender development;
- analyse spatial patterns of Human Development Index and Gender Development Index;
- explain population and resource relationship; and
- describe population-resource regions of the world.

7.2 POPULATION AND DEVELOPMENT INTER-RELATIONSHIP

The relationship between population and development is a two way processes. Population affects development and vice versa. Can you explain this two way processes? Let us explain these two way processes in the following sub-sections.

7.2.1 Population Affects Development

If you analyse the past, you will find that growth of population has affected the development. You have already studied population theory of Malthus in unit 5. As you know population has both quantitative and qualitative aspects. In a particular place population size, growth, distribution, composition in terms of age, sex, level of education and health affects growth and development both positively and negatively. Therefore, population is an essential element in development. Researchers has established that population growth has both positive and negative impact on economic development. Let us discuss both positive and negative impacts of population on development.

A) Negative impacts of population on development: Negative impacts of population on economic development happens by way of hampering various sectors like education, , health, environment, food, economic growth (Todaro & Smith, 2009). Let us discuss some of these aspects that are mentioned above.

(i) **Increasing Poverty**: the negative consequences of rapid population growth affect most heavily to the poor because they are the ones who are landless and suffers from cuts in government health and education programme, bear the brunt of environmental damage and are the main victims of job cut due to the slower growth of the economy.

(ii) **Retarding Economic Growth**: evidence shows that rapid population growth lowers per capita income growth in most of the developing countries particularly countries that are already poor and mostly agrarian based economy.

(iii) **Problems of Food Scarcity and Security**: rapid increase of population poses serious challenges to provide foods (both, in terms of quantity and quality) to billions of population in developing countries. New technologies

have to be invented because fertile lands have already been cultivated and levels of food production have reached a point of saturation.

(iv) **Education**: studies reveal that large family and low income tends to restrict parents to provide education to all the children. In this situation, it has been observed, particularly in developing countries, preference is given male children. Rapid population growth also affects quality of education as the government has less hand to address, equally, the need for all learners, and this directly affects the development of human capital.

(v) **Health**: high fertility harms health of mothers and children. It also increases the health risk of pregnant mothers. It not only affects mothers but also affects newborns, in terms of low birth weight as well as increased infant mortality rate.

(vi) **Environmental Degradation**: The earth's carrying capacity is burdened, not only by the demands of growing population, but also by food requirements by 21 Basic Issues in Development billions of livestock. This leads to the clearing of land for cattle ranching and overgrazing by livestock. While the former is an important factor in tropical deforestation, the latter is a major cause of desertification and soil loss in many countries. Therefore, it has been argued that population growth leads to various environmental degradation like deforestation, desertification and soil erosion, declining fish and animal resources, air and water pollution, etc.

Positive Impacts of Population on Development: On the other hand, the population had a positive effect on development. Development of the population is tailored to the potential development and condition of the existing population. Citizens should be a central point in the development process. More emphasis on the development of human resources quality improvement compared to mere infrastructure development. Large population, if followed by an adequate quality of the population, will be a stimulus for economic growth. Impact of changes in population dynamics will be felt in the long term.

7.2.2 Development Affects Population

As discussed in the beginning that the relationship between population and development is a two way processes. We have already discussed in the preceding paragraphs about effects of population on development. In this section, we will discuss how development affects population.

The first and foremost impacts of socio-economic development is either slow down or increase in population growth depending on the situations. Improvements in developmental parameters particularly in developing nation would lead to improvements in the provision of clean drinking water, improved sanitation, and public health measures such as vaccination against childhood diseases. Such gains can dramatically reduce disease and death rates. As desirable as such gains are, they also boost the rate of population growth. Nations are likely to enjoy sharp reductions in death rates before they achieve gains in per capita income. That can accelerate population growth early in the development process. Demographers have identified a process of demographic transition in which population growth rises with a fall in death rates and then falls with a reduction in birth rates.

The quality of population will impact the development process in a country. Population quality is closely related to the population of a nation's development to process the existing natural resources, to meet the necessities of life and improve their welfare. Indicators of the quality of human resources can be seen from several aspects such as level of education, income and health levels. The quality of the population does not only affect national development at this time. Development of a nation is affected by the conditions of the population in the past. In other words, the condition of the population will affect development.

The quality of the population has a dominant influence on the development of a nation. Human resources also determine the success of national development through the number and quality of the population. A large population is a potential market to produce results, while the quality of the population determines how much productivity. Simon (1977) argued that the effect of population growth on development could be divided into two. First, population growth in the short term it is a negative influence. Second, in the long term, precisely the population growth has a positive effect on development (Simon, 1977).

SAQ I

What are the two broad lines of arguments related to Population and Development inter relationship?

Till now we have discussed the relationship between population and development. You might have also studied various types of development namely economic development, regional development, human development and sustainable development. In the previous section you have also studied how quality of a population affects over all development of a place or region. Keeping that in mind thinkers and social scientists conceptualized the term human development. Let us discuss concept, measurement and spatial patterns of human development in the below given section 7.3.

7.3 CONCEPT AND SPATIAL PATTERNS OF HUMAN DEVELOPMENT

Till now you might have realised that how development of human resources expedites socio-economic development of a region or country. But how do we measure the levels of human development? To measure the levels of human development an index was created which is known as Human Development Index. Have you heard about this index? Before discussing about this index, let us know the concept of human development.

7.3.1 Concept of Human Development

The concept of human development was introduced by Dr. Mahbub-ul-Haq, who described it as development that enlarges people's choices and improves their lives. **In other words, human development focuses on widening of people's choices as well as raising the levels of wellbeing**.

Mahbub-ul-Haq identified four key concepts that are pre-requisite for human development. He termed it as “The four pillars to Human Development.” These are equity, productivity, empowerment and sustainability. Let us discuss these four pillars of human development briefly.

(i) **Equity**: In simple terms it means giving equal access to opportunities available to everyone. In other words it must be equal irrespective of gender, race, income, and caste.

(ii) **Sustainability**: It means providing continuous access to and availability of resource by keeping in mind the future generation. In other words, all future generations should have access to minimum resources utilized by today. You will read in details about sustainability and sustainable development in the next module.

(iii) **Productivity:** It refers to constantly improving capabilities of human resources for delivery their work. Ultimately people are the real wealth for any nation, if they are more skilled their values certainly will go up.

(iv) **Empowerment:** The fourth and final pillars of human development are empowerment. Now days you might be hearing about various schemes by state governments and government of India for socio-economic empowerment of disadvantaged sections of the society. What does this mean? It refers to a type of power which generates choice of freedom in human beings. Good governance and people oriented policy are required to empower human developments.

Therefore, there has been a fair amount of agreement on human development paradigm. The points on which there has been a consensus are as follows:

(i) Development must put people at the centre of its concern

(ii) The purpose of development is to enlarge all human choices, not just income.

Paul Streeten a development economist in his Foreword to the book titled “Reflections on Human Development” by Mahbub-ul-Haq identified six reasons in favour of the human development. The reasons are as follows:

1. The ultimate purpose of the entire exercise of development is to improve the human conditions and to enlarge people’s choice.
2. It is a means to higher productivity. A well nourished, healthy, educated, skilled alert labour force is the most productive asset.
3. It helps in reducing the rate of growth of population.
4. It is friendly to the physical environment also. Deforestation, desertification and soil erosion decline when poverty declines.
5. Improved living conditions and reduced poverty contribute to a healthy civil society and greater social stability.
6. It also helps in reducing disturbances in the civil society and in increasing political stability.

From the above said discussion you might have realized that human development places people at the centre of development and emphasizes that

the purpose of development is to enlarge all human choices, and not just income. It regards economic growth as essential but emphasizes the need to pay attention to its quality and distribution.

7.3.2 Human Development Index – Spatial Patterns

You might have been reading about human development index in your school text book as well as in the news paper. Do you have any idea about the year in which it was constructed for the first time? The Human Development Index (HDI) was developed by United Nations Development Programme (UNDP) in the year 1990 by a group of economists and social scientists led by Dr. Mahbub-ul-Haq. It has been used since then by UNDP in its annual Human Development Report. For the construction of HDI, three indicators were selected. These indicators and their dimensions are discussed in the below given table.

Table 7.1: Human Development Index: Indices and Dimensions

Sr. No.	Indices	Dimension
1	A Long and Healthy Life	• Life expectancy at birth, as an index of
2	Knowledge and Education population health and longevity	• Mean year of schooling • Expected year of schooling
3	Adult Literacy Rate	• The combined primary, secondary, and

Human Development Report 2022 categorised all the 191 countries of the world under four categories. These are very high, high, medium and low. The range values for all the four categories are as follows:

Sr. No.	Levels of Human Development	Range Value
1	Very High	0.800 and above
2	High	0.700 to 0.799
3	Medium	0.550 to 0.699
4	Low	less than 0.550

Let us discuss their spatial distribution all over the world.

1. **Very High Human Development:** Out of 193 countries, there are sixty six countries reported having very high human development (0.800 and above). All the sixty six countries are also economically developed countries. Out of these sixty six countries, forty countries are from Europe followed by 15 countries from Asia, three from South America, two each from North America, Central America and Australia and one each from Africa and Caribbean. This is a positive sign. A decade back situation was not so. Most of the countries were from Europe and North America. Today, the situation is entirely different.
2. **High Human Development:** There are 49 countries in this category. Like very high human development category, this category includes countries from all the continents except North America and Australia. All the countries of these two continents are having very high human development. There are fifteen countries from Asia; seven countries from Europe (mostly from Eastern Europe), seven countries from South America, Five countries from

Africa and rest of the countries are small island countries from Caribbean and Pacific.

3. **Medium Human Development:** There are 44 countries in this category (0.550 to 0.699). Most of the countries are from Asia and Africa. India is placed in this category. Most of these countries were colonies of various European countries and got their independence in the second half of the twentieth century.
4. **Low Human Development:** There are 32 countries reported having low human development. Out of these 32 countries, 30 countries are located in the African continent. Rest two countries are in Asia. These two countries are Pakistan and Afghanistan. If we look at the rest of the thirty countries in Africa, These countries are well spread over the continent. However, it includes most of the countries of Sub-Saharan Africa, western Africa.

SAQ 2

Name the four pillars of development given by Mahbub-ul-Haq.

7.4 GENDER DEVELOPMENT INDEX – SPATIAL PATTERNS

Apart from Human Development Index, you might have been reading about the Human Poverty Index (HPI), Gender Development Index (GDI) and the Gender Empowerment Measure (GEM) etc. Do you know the year in which this index was constructed? The Gender Development Index (GDI) and the Gender Empowerment Measure (GEM) were first introduced in the Human Development Report in 1995. The goal of these assessments was to give the Human Development Index a gender-sensitive dimension (HDI). What does this mean? For the construction of GDI, the same three indicators used for HDI were used. However, dimensions on which it is measured are entirely different. GDI measures gender inequalities in achievement in three basic dimensions of human development: health, measured by female and male life expectancy at birth; education, measured by female and male expected years of schooling for children and female and male mean years of schooling for adults ages 25 years and older; and command over economic resources, measured by female and male estimated earned income.

These indicators and their measurements are discussed in the below given table.

Table 7.1: Gender Development Index: Indices and Dimensions

Sr. No.	Indices	Dimension
1	A Long and Healthy Life	• Female and male life expectancy at birth
2	Knowledge	• Female and male mean years of schooling for adults ages 25 years and older • Female and male expected years of schooling for children
3	A Decent Standard of Living	• Female and male estimated earned income.

Spatial Patterns of Gender Development Index

Like Human Development Index, Human Development Report 2022 categorised all the 193 countries of the world are divided into five groups by absolute deviation from gender parity in HDI values. 11 Countries do not have any data related to Gender Development Index. The five groups and their range values are presented in below given Table 7.2.

Table 7.2: Levels of Gender Development and their Range Value

Levels of Gender Development	Range Value
Group 1	Countries having high equality in HDI achievements between women and men: absolute deviation less than 2.5 percent
Group 2	Countries having medium-high equality in HDI achievements between women and men: absolute deviation between 2.5 percent and 5 percent
Group 3	Countries having medium equality in HDI achievements between women and men: absolute deviation between 5 percent and 7.5 percent
Group 4	Countries having medium-low equality in HDI achievements between women and men: absolute deviation between 7.5 percent and 10 percent
Group 5	Countries having low equality in HDI achievements between women and men: absolute deviation from gender parity greater than 10 percent

Let us discuss their spatial distribution all over the world.

Group 1 Countries: Out of 193 countries, there are seventy three countries reported having very high human development (0.800 and above). Nordic countries namely Iceland, Finland, Norway, and Sweden are the top four countries in the list of Group 1 countries. Among the four, Iceland is the most gender-equal country in the world for the 14th consecutive year and the only one to have closed more than 90 per cent of its gender gap, according to the Human Development Report 2022. Out of these seventy three countries, forty five countries have very high HDI value and one country have low H.DI

Group 2 Countries: There are thirty four countries in the Group 2. These countries are mostly located in Europe (11) followed by Asia (9). Rest 17 countries are spread across two continents namely South America and Australia and small island countries located in Pacific and Atlantic Ocean. Some of the notable examples from Europe are Switzerland, Germany, Netherland, Italy, Greece, and Lithuania. Some of the prominent countries in Asia Hong Kong China (SAR), Japan, Qatar and Malaysia. Not a single country from Africa continent is placed under group 2

Group 3 Countries: There are thirty one countries in the Group 3. Majority of countries in this group are from Africa (12) followed by Asia (10). Like Group 2 countries, rest of the nine countries are spread across South America and small island countries located in Pacific and Atlantic Ocean.

Group 4 Countries: Out of 193 countries, there are ten countries in this group. These countries are mainly from central and South Asia and Africa continent. Some of the notable countries are Uzbekistan, Bangladesh, in Asia and Ethiopia and Rwanda in Africa continent. If you compare HDI values, Uzbekistan is the only country which falls under high category of HDI whereas Ethiopia and Rwanda falls under low HDI category.

Group 5 Countries: Out of 193 countries, there are thirty four countries were placed in Group 5 countries. Most of the countries in this group are from the African continent. Apart from the countries from Africa, there are some countries from Asia

You might be thinking that how does this index helps? It helps in making policy and planning in terms of better understanding of the gender gap in human development achievements. It provides insights into gender disparities in achievements in three basic capabilities namely health, education and command over economic resources. This is also useful for designing and monitoring policies to close the gaps.

SAQ 3

Name the three indices and their related dimensions used for the construction of Gender Development Index.

7.5 POPULATION RESOURCE RELATIONSHIP

Population-resource relationship is dynamic in nature. What does this mean? This means that the relationship over any region keeps on changing. Now the question is that in any given resources base what should be the population size? It is an important issue debated since second half of nineteen century. Here, we shall discuss and understand the different types of population-resources relation of the world. There are two ways in which population-resource relationships are explained. These two ways are carrying capacity and land-human ratio. Before explaining these two concepts in detail, let us have a brief discussion on the concept of resource.

7.5.1 Concept of Resource

In simpler terms the word resource is a combination of two words i.e. ‘re’ and ‘source’. This means anything or substance that may occur unhindered many more times. If you look at different English dictionaries for the meaning of word ‘resource’ the following are the meanings of word resources depicted on Cambridge and Oxford dictionaries.

- a useful or valuable possession or quality of a country, organization, or person (**Cambridge Dictionary**)
- a supply of something that a country, an organization or a person has and can use, especially to increase their wealth (**Oxford Learner’s Dictionary**)

Resource can be divided as subjective as well as objective. Subjective resource denotes internal resource, objective resource is external resource. Examples of subjective resources are namely knowledge, skill, scientific temperament etc. whereas water, forest, minerals etc. are examples of objective resources.

But, if we look at the proper conceptualization of the term 'resource' then it goes back to the year 1933, when the eminent German economist E. W. Zimmermann published his famous "Concept of Resource" in his book titled **"World Resources and Industries".** "Resource, popularly, signifies a source or possibility of assistance; an expedient; means of support; means to attain a given end; capacity to take advantage of opportunities and above all that upon which one relies for aid, support or supply (Zimmerman, 1933).The above definitions vary markedly and fail miserably to produce any comprehensive universally accepted meaning of resource. However, after critical examinations and analyses all these meanings can be grouped into two, i.e., resources may help us if we are: (a) Taking advantage of opportunity and (b) Overcoming obstacles or resistances.

The most popular definition of Zimmermann states that ***"The word resource does not refer to a thing or a substance but to a function which a thing or a substance may perform or to an operation in which it may take part, namely, the function or operation of attaining a given end such as satisfying a want. In other words, the word resource is an abstraction reflecting human appraisal and relating to a function or operation".***

In other words, a thing or substance is not considered as resource when it fails to give satisfaction to human beings. You might be knowing there are many areas in the world where proven reserves of mineral and energy resources namely coal, petroleum, natural gas has already been identified. However, these proven reserves are not considered as resources because these reserves located in the inaccessible terrain and cannot satisfy human wants. Similarly, geo-thermal energy in this contemporary world is considered to be the most useful resource, but, till recently, this was not considered as resource. This is because human being were absolutely ignorant about its uses and we did not have knowledge and technology to use it as energy resource in the past. Till now you might have understood that resource must possess two important properties. These two properties are: (a) Functional ability, and (b) Utility.

Another concept which explains population-resource relationship is the concept of carrying capacity. Let us discuss the concept briefly.

7.5.2 Concept of Carrying Capacity

Carrying capacity is a concept which limits the potential ability of natural resources and species to withstand human intervention. It may be described as a test of the ability of land, water and air to keep itself usable and toxin-free despite pollution and effluent discharges and harmful developments over it.

This term was used by American wildlife conservation ecologist Aldo Leopold described 'carrying capacity' in 1933 as a saturation point at which the numbers of a particular species of grazing animals approached the point

where grasslands could support no more individuals without a general and continuing decline in the quality of the pasture land. While chemical fertilizers, insecticides and pesticides increase crop yield, their use beyond the carrying capacity of land may destroy crops. This is equally true for the effluent discharges into rivers, ponds and other wetlands. The wetlands sustain life forms and complete ecosystems which in turn support larger ecosystems. Earth's carrying capacity is threatened by monoculture (cultivation of a single crop variety), pollution, overpopulation, overgrazing, deforestation and urbanisation. These activities may not be unsustainable in themselves but the thin line that separates them from being beneficial to mankind and becoming harmful is the environmental recognition of the concept of carrying capacity. If taken beyond carrying capacity, the activities may prove disastrous. Carrying capacity also refers to the number of individuals who can be supported in a given area within the limits of natural resources, and without degrading the social, cultural and economic environment for the present and future generations. The carrying capacity for any given area is not fixed. It can be extended to a certain level by improved technology, but mostly it is changed for the worse by pressures which accompany a population increase. As the environment is degraded, carrying capacity actually shrinks, leaving the environment with no ability to support even the number of people who could formerly have lived in the area on a sustainable basis. No population can live beyond the environment's carrying capacity for very long. The average citizen's 'ecological footprint' is assessed by the demands an individual, endowed with average amounts of resources like land, water, food, fibre, waste assimilation and disposal, puts on the environment. While, for a citizen in a developed country the land requirement ranges from about 10 to 12 acres (which is an area far greater than that taken up by one's residence and place of school or work and other places where he or she is in those countries), for a citizen in a developing country it is from less than one acre in a sub Saharan country to around three acres in India. A common fallacy is to believe that a rich country can retain the carrying capacity of its resources in maintaining the standards of their living, by transferring these pressures through trans-national businesses to poorer countries. Since everything is related to everything else, ecological destruction in one country manifests in the form of economic impulsions in other countries. The policy formulators have to think in terms of 'carrying capacity' and not land area. For example, effects of unfettered population growth drastically reduce the carrying capacity in the United States (US) as the unregulated businesses do in India.

7.5.3 Concept of Land-Human Ratio

a) **Over Population:** Overpopulation is a condition when number of population exceeds the carrying capacity of their immediate environment. In simple term, the term usually refers to the relationship between the human population and its environment, the Earth. This is not simply a function of the size or density of the population. Overpopulation can be determined using the ratio of population to available resources. If a given environment has a population of ten, but there is food or drinking water enough for only nine, then that environment is overpopulated; if the population is 100 individuals but there is food, shelter or water enough for 200, then it is not. Overpopulation can result from an increase in births, a decline in mortality

rates due to medical advances, from an increase in immigration, a decrease in emigration, or from an unsustainable use and depletion of resources. It is possible for very sparsely-populated areas to be "overpopulated", as the area in question may have a very meager or non-existent capability to sustain human life (e.g. the middle of the Sahara Desert or Antarctica) Some of the overpopulated regions of the world are India, Bangladesh, Madagascar, Nigeria, Ethiopia, Sudan, Niger, Haiti, Uganda, and Zimbabwe to name a few.

b) **Under- Population**: Under-Population is just opposite to the condition prevalent in overpopulation. Can you explain? Yes, you are absolutely right. In this condition there are more resources in an area in comparison to the total population living in that region or territory. In other words, the maximum human potential of that area is not realized as the resources are not fully exploited. Countries like Canada, Australia and New Zealand can be categorized as under-populated countries. Countries like Canada and Australia can export the surplus of food, energy, and mineral resources, have high incomes, good living conditions and level of technology and immigration. Even within a country, there are certain areas that can be classified as under-populated areas. For example, some rural areas close to major cities in advanced countries such as the UK are under-populated due to outward migration. In the UK, the Southwest Wales and the highlands of Scotland are less densely populated compared to the rest of the country. This has also happened in older declining industrial areas and the outward movement or migration has been due to lower wages and unemployment. This phenomenon results in a decline in a population. With fewer people, there is a decrease in demands for services. The lower level of services therefore sometimes encourages further outward migration.

c) **Optimum Population:** Optimum population has been defined as that size of population enabling per capita output of the maximum orders accompanied by the highest possible standards of living under a given set of economic and technological conditions. Therefore, optimum population lies between two extremes, i.e., overpopulation and under-population, although the size of optimum population is not sacrosanct. This is an ideal condition. It is a theoretically perfect situation difficult to estimate or define. The Penguin Dictionary of Geography characterises optimum population as a situation when the number of individuals can be accommodated in an area to the maximum advantage of each individual. Thus, optimum population yields highest quality of life, which means each person has access to adequate food, water, energy and air of highest quality, adequate medical care, recreational facilities and cultural outlets. In other words, optimum population permits the highest per capita output; therefore, the marginal productivity exceeds the average productivity whereby the rates of growth of total production are the highest.

SAQ 4

Fill in the blanks with appropriate words:

a) _____ is a condition where there are more resources in an area in comparison to the total population living in that region or territory.

b) Bangladesh, Nigeria, Ethiopia, Sudan are examples of _____.

c) Optimum population yields highest _____.

7.5.4 Population Resource Region

Till now you might be thinking that can we show the spatial distribution of population-resource relationship? Edward A. Ackerman's Population-Resource region is one such attempt.

Population - Resource Regions by Edward A. Ackerman: In 1970, Edward A. Ackerman has used three basic criteria for devising the world's regional scheme of population /resource ratio, which are:

- Population factor,
- Resource factor and
- Technology factor.

Among these three variables used in this scheme, the most critical is the magnitude and quality of available technology. Ackerman while using the three factors of population, resource and technology, emphasized more on technology. He suggested a five-fold classification of the world into population/resource regions on the basis of population resource ratios and the availability of technology. These regions are:

1. United States Type
2. European Type
3. Egyptian Type
4. Brazilian Type
5. Arctic Type (Refer Fig. 9.1)

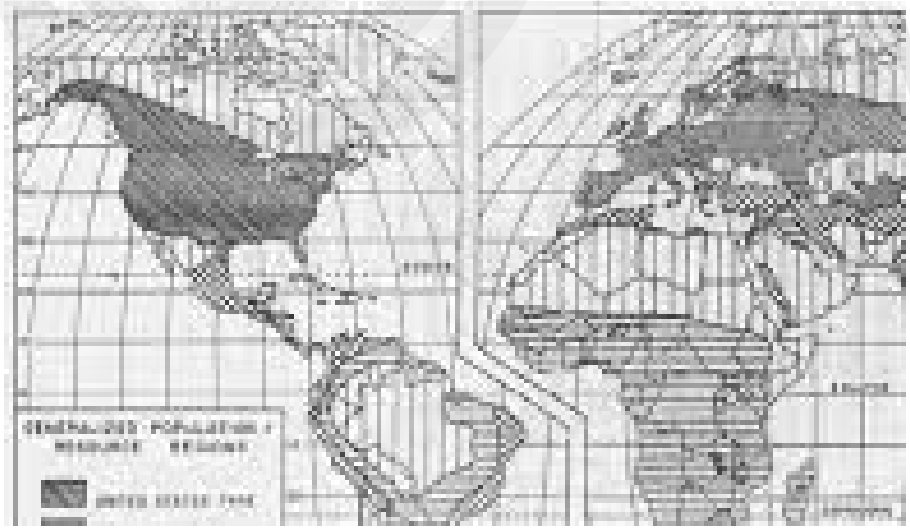

Fig. 9.1: Population-Resource Region by Edward Ackerman.

Let us discuss these five in detail.

1. **United States Type**: It represents the most developed areas of the world enjoying very high standard of living. They witness rapid development in last one to two hundred years as they received massive in-migration from then technically very advance society. In fact at that time most of them

belong to Brazilian type. Original inhabitants of these lands were low in numbers, technically very backward and so they gave up quickly against migrants. These lands were full of pristine natural resources and thus technological support gave them very high growth and prosperity. In contrast to their physical resources the population pressure was very low and so there was always a good scope for the application of higher and higher technology. Slowly they mastered in technology and now the area has so much technology and so many technical persons that they often export them. Their prosperity, wealth and technical knowhow gave them unprecedented advantage in international arena to deal things in their favour. They use resource of not only of their own land but also of other regions. This unfortunate excessive materialistic attitude has done much harm to the nature. Probably they are at the zenith of development using present technological knowhow and the gap between them and the next group is so high that it seems difficult that any new country will be added to this group in near future, instead it is more possible that some of them may slip down to lower group. Examples of this type of population resource relationship are found in USA, Canada, Australia, New Zealand, Argentina and Russia.

2. **The European Type**: Can you imagine the characteristics of this type from the name? This is the region where technology is very advance like United States type. However, this region is inhabited by high population with limited physical resources. As a result of which it has created high population pressure in this region. High living standard is maintained by constant technological upgradation, resource conservation and recycling, one of the best output practices along with export of technology, technical knowhow and export of finished goods. So their prosperity relies on a combination of advance technology, efficient resource utilization and conservation and international trade and services. Of this type of population resource relationship are most of the countries of Western, Southern and Eastern Europe and Soviet Central Asian republics, Singapore, South Korea and Japan.

3. **Brazilian Types**: This is practically a transition stage were the pressure of population to physical resources is low and so these areas have high promises. They have ample physical resources but their technologies are poor and so their prosperity is average. If they receive or develop good technology, sufficient social overhead capital, etc. then their resource exploitation efficiency will expand and it will bring them to a trajectory of higher prosperity like of European type. If only population expand and not technology and quality of population, then such region may slip to the inferior category of China type. Example: Brazil, Bolivia, Venezuela, Paraguay, interior Argentina, Central American Republics, Cuba, north Australian territory, etc.

   One sixth live in technology- deficient areas with low population/resource ratios, as in much of Latin America, Africa and South-East Asia, where resources sometimes remain unused because of the problems of developing difficult environments.

4. **Egyptian Types**: This is the least promising of all categories. State of technology is poor and excessive population has caused very high stress

on physical resources. So, industrialization is low, agriculture which is the mainstay of economy is in dilapidated condition and high population is expanding at higher rate. Many social issues like poverty, unemployment, malnutrition, illiteracy, etc. are very common. Probably rapid population growth is the biggest single problem here which if controlled then only this region has chance of moving towards European type of prosperity. Examples: Egypt, Algeria, Tunisia, Morocco, Albania, Greece, Haiti, Guatemala, China, India, Pakistan, Sri Lanka, Afghanistan, etc.

5. **Arctic Types**: You might have understood the features of this region from the name itself. This region covers largely uninhabited ice caps of tundra region. This is the land of the future with many unexplored resources due to the lack of technological maturity. This region is either uninhabited or a very few people reside there. Technological advancement may invite more human intervention in these areas of hostile geo-environmental conditions in future. Examples: Covers the Antarctica, northern part of North America and Eurasia, the Amazon basin, the Sahara desert, deserts of Central Australia, Chile, Patagonia, etc.

SAQ 5

Match the following:

Population-Resource Regions	**Country**
a. United States Type	i. Argentina
b. European Type	ii. India
c. Egyptian Type	iii. Australia
d. Brazilian Type	iv. Japan

7.6 SUMMARY

In this Unit, you have learnt the following:

- The relationship between population and development is a two way processes. Population affects development and vice versa.
- The Human Development Index (HDI) was developed by United Nations Development Programme (UNDP) in 1990 by a group of economists and social scientists led by Dr. Mahbub-ul-Haq. It has been used since then by UNDP in its annual Human Development Report
- The Gender Development Index (GDI) and the Gender Empowerment Measure (GEM) were first introduced in the Human Development Report in 1995. The goal of these assessments was to give the Human Development Index a gender-sensitive dimension (HDI). For the construction of GDI, the same three indicators used for HDI were used. However, dimensions on which it is measured are entirely different.
- GDI measures gender inequalities in achievement in three basic dimensions of human development: health, measured by female and male life expectancy at birth; education, measured by female and male expected years of schooling for children and female and male mean years of

schooling for adults ages 25 years and older; and command over economic resources, measured by female and male estimated earned income.

- There are different types of population-resources relation of the world. Broadly there are three conditions namely over population, under population and optimum population.
- Edward A. Ackerman's Population-Resource region is one such attempt. He used three basic criteria namely population, resource and technology for devising the world's regional scheme of population-resource region. He suggested a five-fold classification of the world into population/resource regions namely United States type, European type, Egyptian type, Brazilian type and Arctic type.

7.7 TERMINAL QUESTIONS

1. Analyse population and development relationship with suitable examples.
2. Describe the four pillars of development as suggested by Mahbub-ul-Haq.
3. Explain the indices and dimensions used for the construction of Human Development Index. Discuss the spatial patterns of human development in the world.
4. Explain the indices and dimensions used for the construction of Gender Development Index. Discuss the spatial patterns of Gender Development Index in the world.
5. Discuss the population-resource relationship with suitable examples.
6. Describe Population-Resource Region given by Edward Ackerman with examples.

7.8 ANSWERS

Self-Assessment Questions (SAQ)

1. The two broad lines of arguments are that (i) population growth is not the real problem; and other group believes that (ii) it is a real problem.
2. The four key concepts that are pre-requisite for human development are equity, productivity, empowerment and sustainability.
3. The three indicators are long and healthy life, knowledge and a decent standard of living. Long and healthy life is measured by female and male life expectancy at birth; knowledge is measured by female and male expected years of schooling for children and female and male mean years of schooling for adults ages 25 years and older; and decent standard of living is measured by female and male estimated earned income.
4. a) under population; b) over population; c) optimum population
5. a-iii; b-iv; c-ii; d-i

Terminal Questions

1. Refer to Section 7.2

2. Refer to Section 7.3.1
3. Refer to Section 7.3.2
4. Refer to Section 7.4
5. Refer to Section 7.5.1, 7.5.2 and 7.5.3
6. Refer to Section 7.5.4

7.9 REFERENCES AND FURTHER SUGGESTED READING

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UNIT 8

POPULATION POLICY

Structure

8.1 INTRODUCTION

In the previous unit, you have studied about population dynamics. There are three major components of population dynamics namely fertility, mortality and migration. Under each component, concepts, measurements, trends and patterns in the world and India has been discussed in detail. Have you ever thought about mechanism of solving issues and challenges emerged due to these population dynamics? Population policies and programmes are formulated by different countries including India to address such emerging issues and challenges. Why do governments formulate policies and programmes? This is because the central function of the state is to produce public goods? Do you know what a public good is? Public goods are those goods which are non-excludable and non-rivalrous. In simpler term it refers to goods that are available for use of everybody and one person's usage of it does not diminish or exhaust its availability to others.

In this unit, we will describe the need for population policy in section 8.2. In the section 8.3 an attempt has been made to outline the elements of a population policy. In the final section i.e. section 8.4, outlines of selected population policies both from developing and developed world has been discussed. In the final section i.e. section 8.5, a brief discussion on population policies in India has been presented.

Expected Learning Outcomes

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

- describe the need and rationale for population policy;
- explain various elements of population policy;
- discuss selected population policies both from developing and developed world
- Analyse population policies in India

8.2 WHY POPULATION POLICY?

The basic questions that instantly come to our mind are what is a population policy and why do we need a population policy. In simpler terms population policy may be defined as:

Deliberately constructed or modified institutional arrangements and/or specific proportions through which governments influence, directly or indirectly, demographic change (Demeny, 2002).

In simpler terms, population policy is a strategy for achieving a particular pattern of demographic change. The change could be both quantitative as well as qualitative. Population policies are primarily a response to the anticipated consequences of fertility and mortality, and secondarily to internal and international migration that also modify the size, composition, and regional distribution of the population (Schultz, 2010).

8.2.1 Rationale for Population Policy

Now, you might have understood the meaning of a population policy. Let us discuss about the rationale behind formulation of a population policy. Before analyzing the rationale of population policy, we have to understand the role and function of a state. In simpler terms, the state is an institution created by the voluntary association of the individual members of a given society to further their interests. Therefore, the central function of the state was to produce public goods. We have already discussed the meaning of public good in the introduction of this unit. If we look at in the context of India then we can clearly observe it in the Preamble of the Indian Constitution. It strives towards establishing Justice, insure domestic tranquility, provide for the common defence, promote the general Welfare, and securing the individual Liberty and Posterity.

Looking at the broader goals enshrined in our Constitution, government examine its past and present population demographics in order to predict future population trends. This would help in determining the optimum population size with relation to the resources a country has. This will lead to the most suitable population policies being chosen for the country. Simultaneously, population policies have different components. However, three main elements are considered when deciding on a population policy, namely fertility**,** mortality, and migration**.**

In pursuing such goals, regulation of immigration into a state's territory is clearly defined as a public good, thus delineating a particular role for population policy. In a similar manner, fertility may also be construed as a public good, if it's level as determined by spontaneous social interaction is too high or too low in terms of the collective interest. However, to claim a role for the state in the matter of fertility is more problematic. Additions to the population are the result of a multitude of individual decisions concerning childbearing. Within the constraints of their social milieu, these decisions reflect an implicit calculus by parents about the private costs and benefits of children to them, including consideration of the interests of the children themselves. But neither costs nor benefits of fertility are likely to be fully internal to the family rather they can also impose burdens and advantages on others in the society as well. Therefore, it represent a legitimate concern for all those affected. An individual's influence on the fertility of other families.

Population policy should therefore strive towards institutions and incentive systems that provide signals to individuals and guiding them to behave in harmony with the collective interest.

SAQ I

What is Population Policy?

8.3 ELEMENTS OF A POPULATION POLICY

Till now you might have realised the importance of a population policy. But, do you have any idea about the elements of a population policy? As mentioned in the previous unit population dynamics have three key elements namely fertility, mortality and migration. Demographic change in a society are the net result of interplay among the three above mentioned components of population change. Therefore before formulating any population policy, the first and foremost task is to assess the past and present demographic trends and their determinants in a country. This is followed by an appraisal of the future demographic change if the present trends continue, and its social and economic consequences. Accordingly appropriate measures are designed to regulate the future demographic change in the desired direction. Policy makers are, therefore, concerned with factors affecting these components, both at the aggregate level and among different socio-economic segments in order to regulate them in the desired direction. However, most of the population policies, mostly in the developing countries including India, are directed mostly on fertility. Although mortality and migration also form important parts of a population policy, less importance has been given to both the components in comparison to fertility. Let us discuss these three components in details.

8.3.1 Fertility

In so far as fertility as an element in population policy is concerned, it can be grouped under two distinct approaches namely pro-natalist and anti-natalist. Do you know what a pro-natalist and anti-natalist policy is? Pro-natalist

policies are designed with the purpose of increasing the fertility or birth rate of an area. On the other hand anti-natal policies are just opposite to pro-natalist policies and are aimed to decreasing the fertility or birth rate of an area. The low-fertility level countries, in general, adopt pro-natalist approach in order to stimulate growth in population. On the contrary, for the high-fertility countries adopt the anti-natalist approach in order to restrain growth in their populations. As noted already, the pro-natalist policy has been adopted in the past in order to cope with high death rates. Presently, most of the European countries marked with a very slow growth, and even decline in their populations provide examples of pro-natalist population policy. Prominent among them are Sweden, France, Romania and Hungary.

Let us discuss policies of some of the countries that have adopted pro-natalist and anti-natalist policy.

Sweden has a highly developed population policy that is geared around sustaining growth in population. Remarkably, however, the consideration of individual welfare and personal freedom takes precedence over the national expansionist policy in the event of any conflict between the two. On the basis of the recommendations of the Population Commission set up in 1935 and 1941, the Swedish government has made provisions for various welfare measures aimed at voluntary parenthood and child welfare. In order to ensure voluntary parenthood, contraceptives are made available to the people, and laws against induced abortion have been relaxed. Sex education has been made a regular part of teaching in schools. Thus, Swedish population is truly a welfare policy designed to improve the quality of population rather than being an "expansionist in the true sense of the term.

France offers another example of pro-natalist policy in modern times encouraging family formation and childbearing in order to overcome the problems of ageing and decline in population. Financial aid for marriage and childbearing, and measures restricting contraceptive and induced abortion, form part of the policy in France. Although distribution of contraceptives was later legalized in 1967, restrictions against advertisement of the same continued to exist. Families get monthly allowances at an increasing rate depending upon the number of children under 15 years of age (in some special cases 20 years of age). Similarly, families having a single bread-earner are also entitled for a monthly allowance, the rate of which varies depending upon the number of children. In addition, prenatal and maternity allowances are available to all women. Further, additional incentives are provided to married couples in the form of government loan for various purposes, tax reduction and certain rebates on the public services etc.

In Asia, **Japan** is, perhaps, the only country with a pro-natalist policy. Japan's fertility affecting policy has been unique in the world. During the intervening periods of the two wars, Japan had adopted a population policy under the influence of the 'eugenic movement' designed for encouraging growth of a racially ‘pure’ population. Soon after the end of the Second World War, the country switched over to anti-natalist population policy, which continued up to the 1960s. By the end of the 1960s, it was increasingly realized that a sustained low birth rate was resulting in ageing of the population and decline in the young labour force. Therefore, in 1969, the Population Problems

Advisory Council recommended a moderate populationist approach. The emerging demographic trends compelled the country once again to revert back to pro-natalist policy. Family planning programmes came to be identified as measures enabling married couples to have as many children as they desired. The pro-natalist drives we further intensified with the introduction of the Child Allowance Scheme, although presented in the form of a welfare scheme rather than a pro-natalist measure.

On the contrary, less developed countries are having high-fertility invariably marked with anti-natalist population policies. Anti-natalist population policies in such countries were necessitated by a phenomenal growth in population during the recent past. Most of these countries including India have, therefore, incorporated a series of measures to control the birth rate. These anti-natalist policies include both direct and indirect measures for fertility control. While the direct measures include provision of contraceptives, liberalisation of laws regulating abortions, increase in age at marriage etc., the indirect measures tend to reduce fertility levels indirectly through some other proximate variables. They include measures aimed at improving the status of women; strengthening health care services for mothers, infants and children; providing social security; popularising population education at school and college levels etc. They are included in various development programmers undertaken by the government. In addition to these measures, various incentives and disincentives aimed at controlling the birth rate also figure among the indirect anti-natalist measures.

8.3.2 Mortality

Humans have been relentlessly making efforts to improve mortality conditions, and to enhance longevity since the inception of human civilisation. It is a logical, therefore, that policies aimed at reducing the incidence of death have been an integral feature of human societies throughout its history. Broadly defined, policies pertaining to mortality do not merely aim at reduction in mortality rates, but also include measures for improvement in the health conditions of people.

In the developed countries, death rates have already reached the lowest possible level. In such countries, therefore, population policies, as such, do not place more emphasis on reduction in mortality rates. Rather, these countries have been focusing on welfare policies namely health insurance scheme. On the other hand, in developing countries, where mortality rates are still very high, control over morbidity and mortality has been accorded a very high priority in the population policies. Death rates in many of the less developed countries have undergone significant decline during the recent times in the wake of the spread of heath care measures. International organisations like WHO have played a major role in the eradication of some of the ‘killer’ diseases from these countries.

8.3.3 Migration

Policies under this section can be broadly grouped under two categories namely international and internal migration. Let us discuss both the components and their representation in the population policy briefly.

As far as international migration is concerned, most of the countries today have now well-defined policies regulating immigration – both regular flows as well as migration of refugees, asylum seekers or illegal immigrants – from across their boundaries. Although immigration of highly skilled professionals is encouraged, such policies prescribe for strict quota for different source regions. A number of countries at the same time impose restrictions on emigration of skilled and professionals in order to curb 'brain drain' from their country. In 2013, 73 percent of the countries reported policies to maintain the current level of immigration while another 15 percent had policies to reduce it (Chamie, 2016:46). Of late more and more countries have framed policies encouraging return migration of their citizens. In addition to these national policies, the UN and other intergovernmental agencies propose conventions from time to time addressing issues related to international migrants and their rights (Chamie, 2016:47).

In so far as internal migration is concerned, most of the countries offer liberty to their citizens to move freely within their boundaries on their choice. In much of such internal migrations in the world is unplanned and unguided. The most important of such migration is the one that takes place between the rural and urban centres, particularly among the less developed countries. The problems of congestion and slums have become integral features of the urban landscape in such countries. Efforts to tackle these problems can be seen in the form of measures related to city planning, urban renewal and relocation of industry apart from various aid/incentives to the agricultural sector. In such countries, the efficacy of development programmes depends, in part, on the success with which they are able to regulate internal migration. Instances of some successful internal migration affecting policies can be seen in Indonesia and Malaysia. Elsewhere, including India, measures aimed at regulating internal migration form part of the overall public policies of development strategies. The indirect measures regulating internal migration are various tax incentives and disincentives in the location of industries, subsidies to industries located in certain areas, investments in public services and utilities, decentralisation of government services, location of administrative headquarters in certain locations etc. Problems, however, arise when such measures come in conflict with the economic goals of a country. More often than not, under economic compulsion, economic goals take precedence over measures aimed at regulating internal migration.

In the next section, we will discuss about these three elements together in the context of developed and developing countries across the world.

SAQ 2

a) What is pro-natalist and anti-natalist population policy?

b) What is the worldwide trend of immigration policy?

8.4 OVERVIEW OF SELECTED POPULATION POLICIES

In this section population policies are broadly grouped under two categories namely developed and developing countries. While doing so we must be very clear that each country within this binary categories have their own problems which are very country specific. Therefore in this section we will discuss some of the common policy issues of both the categories.

8.4.1 Population Policy in Developing Countries

Since the 1950's, the population policy in the developing world has become essentially synonymous with family planning programs. Financial and administrative limitations within developing countries necessitated the heavy involvement of foreign assistance in launching and sustaining family planning programs. Declared demand for birth control does not necessarily translate into effective willingness to practice it. Weakness of measures of latent demand, or "unmet need," is reflected in the requirements that programmes are supposed to satisfier if they are to be successful. These, typically, included the following components:

- doorstep accessibility of quality services;
- broad choice of contraceptive methods;
- forceful IEC [information, education, and communication] programs;
- sound financing strategies;
- sound management with proper logistics;
- evaluation systems,"
- a continuous process of strategic thinking, planning and management, and
- staff leadership for program parameters" (Mahler 1992: 5).

The effectiveness of family planning programs in reducing fertility remains a matter of controversy. But some of the more successful programs, notably in Asia, tended to increase acceptance by often heavy-handed methods of persuasion, and, in the especially important case of China, by coercion backed by legal sanctions. Where fertility fell in less developed countries with active family planning programs, it is typically found that program-provided free services account for a large percentage of those practicing contraception. But what would have happened in the absence of the program is conjectural. Some less developed countries that lacked government programs also experienced major falls in fertility. Brazil is a conspicuous example. Similarly, if programs have seemingly only minor success in reducing fertility, this can be taken as evidence that the program is inadequately financed, organized, and managed.

In India, the experience is mixed India was the first country in the world to introduce a National Family Planning Policy in 1952. It was basically voluntary in nature, except during a short emergency period, and target-based in approach. During the 1991 Census, it was observed that there is a clear cut demographic divide between Northern BIMARU (BI stands for undivided Bihar, MA stands for undivided Madhya Pradesh, R stands for Rajasthan and U stands for undivided Uttar Pradesh) States in comparison to southern states of

Kerala and Tamil Nadu. Major factors responsible for this are differences in literacy, particularly female literacy, and health care facilities.

On the eve of the 1994 International Conference on Population and Development, a review on the importance of fertility decline for successful development, reached the guarded conclusion that the data on the subject "mostly supports the view that rapid population growth in poor countries under conditions of high fertility is inimical to many development goals" (Cassen, 1994). Accordingly, the development rationale of family planning programs was gradually dropped and was replaced by the argument that the programs satisfy important health needs and help people exercise a fundamental human right. The Cairo conference formalized this shift. Family planning programs were redefined, instead, as reproductive health programs, responding to a broader range of women's health needs, such as prevention of unsafe abortions and sexually transmitted diseases, including HIVIAIDS. But beyond this, new emphasis was put on some requirements that would contribute to women's empowerment: reduction of infant and maternal mortality and improvement in girls' education and women's opportunities for employment and political participation. These are conditions that are likely to help reduce the birth rate through stimulating the demand for smaller family size.

8.4.2 Population Policy in Developed Countries

In developed countries, though birth control measures have been universally adopted for a long time. Yet, there are very few countries that have formulated an explicit national policy on population growth. On the other hand, there are many European countries that still follow pro-natalist policy due to their concern about declining population. But, indirectly population-related issues are reflected in various other policies enacted for economy, health and welfare measures. Some of those laws relate to the availability of contraceptives, sterilizations, abortions, marriage, divorce, income taxes, family allowances, and immigration (Chandna, 2008).

In developed countries a quite different demographic phenomenon has begun to attract increasing attention: Fertility levels that are inadequate for the long term maintenance of the population. This fertility trend was detected earlier also, especially in Europe, in the 1920s and 1930s. But, in the decades immediately following World War, the baby boom seemed to make the issue of low fertility moot. The baby boom was, however, a temporary interruption of the downward trend in fertility. By the 1970s, the net reproduction rate was at, or below, unity in most countries in Europe, and also in the United States. In the US, fertility stabilized at, or very close to, that rate, but in Europe, fertility continued to decline. If continued, in the absence of large compensatory immigration this would not only lead to rapid population decline, but also result in very high proportions of the population at old ages. Surprisingly, most governments as well as the general public tend to view below replacement fertility with equanimity quite unlike the alarmed reaction that the same phenomenon elicited between the two World Wars. And, explicit pro-natalist policies, common in the 1930s, are conspicuous by their absence.

Among the factors explaining the low level of fertility despite general material affluence, many observers point to the double burden on women of both

raising children and working outside the home. To the extent that higher birth rates are seen to be socially desirable, the derived policy prescription is to adopt measures that make motherhood and women's labour force participation more compatible. The higher fertility in countries, notably in Scandinavia, where such measures are strongly applied, compared to countries of Southern Europe, where they are largely absent, suggests that enhanced compatibility (through day care services, flexible work hours, liberal sick leave allowances, and the like) is an effective pro-natalist policy, even if motivated by other considerations. But it is far fi-om clear whether the fertility differential so generated is high enough to bring the total fertility rate back to replacement level.

SAQ 3

a) Why did not the demand for birth control translate into practice?

b) Why did many European countries follow pro-natalist policy?

8.5 POPULATION POLICIES IN INDIA

Do you know, India was the first country in the world to have an official family planning programme in the year 1952? However, the first Population Policy announced by Government of India in the year 1976. The last National Population Policy was announced in the year 2000. This policy was different in its approach than the previous policies. In this section we will discuss Population policies of India under two major sub-sections namely National Population Policies before the year 2000 and National Population Policy 2000.

8.5.1 Population Policies Prior to The Year 2000

As discussed in the beginning of this section, India was the first country to start family planning programme. However, the first national population policy was enacted in the year 1976. In the post-emergency period, the then Government announced a New Population Policy in 1977. Let us discuss these policies briefly.

National Population Policy 1976: This policy was based on target and incentive based. Salient features of National Population Policy 1976 were as follows:

1) To raise the age of marriage for girls to 18 years and for boys to 21 years.
2) To take special measures to raise the level of female education in all States.
3) Raising the monetary incentive to persons undergoing sterilisation according to the number of children in the family.
4) Additional incentives to government employees undergoing sterilisation, having up to two children.

National Population Policy 1977: The main features of this policy were:

1) Renaming the family planning programme into family welfare programme.

2) Fixing the marriage age for girls at 18 years and for boys at 21 years. This has been implemented by the Child Marriage Restraint (Amendment) Act, 1978.
3) Making sterilisation voluntary.
4) Including population education as part of normal course of study.
5) Monetary incentive to those who go in for sterilization and tubectomy.
6) Private companies to be exempted in corporate taxes if they popularise birth control measures among employees.
7) Use of media for spreading family planning in rural areas, etc.

This policy put an end to compulsory sterilisation and laid emphasis on voluntary sterilization.

8.5.2 National Population Policy, 2000

The last National Population Policy (NPP) was announced in the year 2000. The basic philosophy of this policy was derived from International Conference on Population and Development (ICPD), which was held at Cairo, Egypt in the year 1994. This is considered as the first ever comprehensive and holistic population policy of the country. The NPP envisages overall economic and social development as the goal to improve the quality of life of the people, to enhance their wellbeing and to provide them with opportunities and choices with a comprehensive, holistic and multi-sectoral agenda for 'population stabilisation.' If we analyse this policy in comparision to the previous policies, this policy does not believe in target specific approach.

For achieving above mentioned goal, NPP envisaged three types of objectives. Those objectives are as follows:

1. The immediate objective is to address the unmet needs for contraception, health care infrastructure and health personnel and to provide integrated service delivery for basic reproductive and child health care.

2. The medium-term objective is to bring the Total Fertility Rate (TFR) to replacement level by 2010 through vigorous implementation in inter-sectorial operational strategies.

3. The long-term objective is to achieve a stable population by 2045 at a level consistent with the requirements of sustainable economic growth, social development, and environment protection. Targets: The following are the targets of National Population Policy: 1. Achieve zero growth rate of population by 2045. 2. Reduce infant mortality rate of below 30 per thousand live births. 3. Reduce maternal mortality ratio of below 100 per 1, 00,000 live births. 4. Reduce birth rate to 21 per 1000 by 2010. 5. Reduce total fertility rate (TFR) to 2.1 by 2010.

It envisions population stabilisation as a function of:

- accessible and affordable reproductive health;
- increased coverage and outreach of primary and secondary education;

- assured availability of basic amenities like sanitation, safe drinking water and housing;
- women empowerment with enhanced access to education and employment; and
- infrastructure development like roads and communication.

Thus, it promotes open information, awareness, empowerment and development based approach and sums up 'population stabilisation' as a multi-sectoral endeavour. In principle, it unequivocally rejects the targets and the incentive/disincentive approaches and provides for a Target-Free Approach (TFA). The NPP is gender sensitive and incorporates a comprehensive holistic approach to the health and education needs of women, female adolescents and girl child. A primary theme running through the NPP is provision of quality services and supplies and arrangement of a basket of choices i.e. people must be free and enabled to access quality health care, make informed choice and adopt measures for fertility regulation best suited to them.

National Population Policy is the affirmation and articulation of India's commitment to International Conference on Population and Development (ICPD) agenda. It was at the Cairo Conference, that for the first time, a consensus was reached among many countries, including India, which, was a remarkable development in many ways. The ICPD in 1994 successfully adopted a Programme of Action, which constituted a paradigm shift in thinking and action on population issues globally. Though India is yet to fully incorporate the provisions of this convention in its domestic laws, but by virtue of the country being a signatory to this international convention, civil society has a moral right to ask the government not to deviate from its to the ICPD agenda. The Cairo Consensus forged at the 1994 International Conference on Population and Development (ICPD) is underpinned by human rights principles. The Introduction to Population, Sustainable Development and commitment Human Development ICPD and ICPD +5 placed population, reproductive health and gender equality in a human rights-based framework linked to human development and sustained economic growth. A human rights-based approach to programming differs from the basic needs approach in that it recognizes the existence of rights. It also reinforces capacities of duty bearers (usually governments) to respect, protect and guarantee these rights. In a rights-based approach, every human being is recognized both as a person and as a right-holder. A rights-based approach strives to secure the freedom, well-being and dignity of all people everywhere, within the framework of essential standards and principles, duties and obligations.

The rights-based approach supports mechanisms to ensure that entitlements are attained and safeguarded. Governments have three levels of obligation namely to respect, protect and fulfil every right. These obligations were:

- To respect a right means refraining from interfering with the enjoyment of the right.
- To protect the right means enacting laws that create mechanisms to prevent violation of the right by state authorities or by non-state actors. This protection is to be granted equally to all.

- To fulfil the right means to take active steps to put in place institutions and procedures, including the allocation of resources to enable people to enjoy the right.

A rights-based approach develops the capacity of duty bearers to meet their obligations and encourages rights holders to claim their rights. Rights are indivisible, interdependent and interrelated. The human rights-based approach focuses on those who are most vulnerable, excluded or discriminated against. The human rights-based approach constitutes a framework of action as well as a methodological issue. This approach is also expected to achieve results: sustained progress towards respect of human rights, development, peace, security, and eradication of poverty, population stabilization with gender equity and equality and achievement of the Millennium Development Goals.

SAQ 4

How is rights-based approach to population programme differs from the basic needs approach?

8.6 SUMMARY

In this unit, you have studied:

- Population policy may be defined as deliberately constructed or modified institutional arrangements and/or specific proportions through which governments influence, directly or indirectly, demographic change (Demeny, 2002).
- The formulation of an ideal population policy is a multi-stage exercise. It begins with an assessment of the past and present demographic trends and their determinants in a country. This is followed by an appraisal of the future demographic change if the present trends continue, and its social and economic consequences. Accordingly appropriate measures are designed to regulate the future demographic change in the desired direction.
- Population policies of developed and developing countries have distinct emphasis, depending upon their socioeconomic and demographic history. Population policy in the developing world has become essentially synonymous with family planning programs.
- In developed countries, though birth control measures have been universally adopted for a long time, yet, there are very few countries that have formulated an explicit national policy on population growth. On the other hand, there are many European countries that still follow pro-natalist policy due to their concern about declining population. But, indirectly population-related issues are reflected in various other policies enacted for economy, health and welfare measures.
- India was the first country in the world to have an official family planning programme in the year 1952. However, the first Population Policy announced by Government of India in the year 1976. The last National

Population Policy was announced in the year 2000. This policy was different in its approach than the previous policies.

- National Population Policy, 200 is the affirmation and articulation of India's commitment to International Conference on Population and Development (ICPD) agenda. It forms the blueprint for Population and Development Programmes in the Country.

8.7 TERMINAL QUESTIONS

1. Describe in detail the rationale for a population policy.
2. Discuss in brief the three major elements of a population policy.
3. Explain major thrusts of population policies in developed and developing countries of the world.
4. Highlight salient features of India's National Population Policy, 2000.

8.8 ANSWERS

Self-Assessment Questions (SAQ)

1. It is defined as deliberately constructed or modified institutional arrangements and/or specific proportions through which governments influence, directly or indirectly, demographic change
2. a) Pro-natalist policies are designed with the purpose of increasing the fertility or birth rate of an area. On the other hand anti-natal policies are just opposite to pro-natalist policies and are aimed to decreasing the fertility or birth rate of an area.
3. a) Conflicting desires may interfere. Weakness of measures of latent demand, or "unmet need.

   b) Due to their concern about declining population.
4. A rights-based approach recognizes the existence of rights and reinforces capacities of duty bearers (usually governments) to respect, protect and guarantee these rights. In this approach, every human being is recognized both as a person and as a right-holder and strives to secure the freedom, well-being and dignity of all people everywhere, within the framework of essential standards and principles, duties and obligations.

Terminal Questions

1. Refer to Section 8.2
2. Refer to Section 8.3
3. Refer to Section 8.4
4. Refer to Section 8.5

8.9 REFERENCES AND SUGGESTED READING

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GLOSSARY

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

Crude Birth Rate (CBR) : Crude birth rate (CBR) is the ratio between the number of births in a single year and the total population and is expressed as a number per thousand.

Crude Death Rate (CDR) : Crude death rate (CDR) is the ratio between the number of deaths in a single year and the total population, and is expressed as a number per thousand.

Demographic Transition Model : 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 industrialized economy.

Dependency Ratio : 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.

Ecological Footprint : 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.

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

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

Infant Mortality Rate (IMR) : The number of infant deaths per thousand live births in a population during a calendar year.

Natural Growth Rate : Natural Growth Rate is the difference between birth rate and death rate.

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.

Resources : Resources are anything that satisfies human wants.

Stock : Stores of resources which are currently unused.

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.