UNIT 2 : DYNAMICS OF POPULATION GROWTH

UNIT STRUCTURE

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2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- explain the determinants and measurement of population growth
- identify the present status of poulation of India
- discuss the population trend in India
- explain the various factors influencing the population growth in India.

2.2 INTRODUCTION

This unit introduces you to some determinants of population growth and various factors of population growth. The population growth is a recent phenomenon. The term 'population growth' refers to how the number of individuals in a population increases or

decreases with the passage of time. The population in India has been growing continuously due to declining general mortality rate and the increase in the expectation of life at birth and high fertility rate. The rapid growth of population indicates that India, in respect of population growth, will reach the first place in the whole world within half a century. The population growth rate is 2.2 percent which means 13 million people would be added to the over–crowded population of India every year. The rate of birth and death and the migration of people help in the population growth. The traditional early marriage leads to high birth rate and late marriage declines the birth rate. For the religious beliefs and faith, people are eager to follow the previous norms of population. But, we can control all such determinants of population growth.

The population distribution is not evenly distributed across the world. More than half of the world's population live in Asia. India has about 17 percent of the world's population which is more than the total population of Europe or equal to the combined population of North America and Africa.

2.3 DETERMINANTS OF POPULATION GROWTH

The most important determinants of population growth are birth rate, death rate and migration. The increase of population at an alarming rate is the result of high birth rate. The birth rate is usually high due to illiteracy among the people, absence of knowledge about family planning, early marriage, social beliefs and custom, attitude towards children etc. Fertility of human being is also another remarkable aspect which accounts for high birth rate. According to Thompson and Lewis, "Fertility is generally used to indicate the actual reproductive performance of a woman or groups of women". So put simply, fertility is the ability of the female to give birth to a child. Higher fertility increases higher birth rate. There are various factors for higher fertility rate. They are – universality of marriage, early marriage, higher fertility norms, preferences for sons, low economic status, illiteracy among girls, agrarian society etc. Under such conditions, people encourage fertility that renders a heavy impact on the growth of population.

Reducing mortality or death rate is also responsible for higher population growth rate. Radical development in medical science as well as health care are two important factors for lower death rate. The combined results of these factors are seen in the decline

in the occurrence, or in the complete eradication of many fatal diseases. As a result, the death rate has come down to roughly 15 per thousand. Similarly, the mortality rate of infants and women at the time of delivery are also decreasing. Rapid development in medical sciences controls all types of diseases through medicines and surgery, the increasing stress on cleanliness and hygienic surroundings, pollution control, balanced food, health consciousness etc. have caused significant decline in the mortality rate among the people. Spread of education has made more and more people conscious about their health and life. Spread of literacy among women and a ban on early marriage are the factors behind the reducing rate of death among the women, and as a consequence, population is growing at a higher pace. Population growth is the change in population over time. Generally, Population growth primarily happens due to natural increase, that is, the excess of births over deaths. But migration is an equally valid cause behind the growth of population when the amount of immigration exceeds the amount of emigration.

As compared to the rate of birth and death, migration has a limited role as a determinant of population growth. When people migrate from one place to another with an objective of setting down, population generally increases. Various factors such as shortage of land, lack of modern facilities, natural calamities like famine, earthquake, flood, discrimination on grounds of race and religion, low income etc. cause migration which can be both external and internal and has a strong bearing on the population growth. People always migrate to places where they get better employment opportunities, security of life and property, education and health facilities and so on.

2 1.6 LET US SUM UP

- Population growth depends upon three factors. These are: birth rate, death rate and migration
- Population growth occurs when-
  - birth rate is high
  - death rate is low
  - there is migration due to migrant's positive attitude for their future life

2.4 MEASUREMENT OF DETERMINANTS OF POPULATION GROWTH

There are some tools that help to measure the growth of population. The following are some of the ways that determine the trend of population growth.

2.4.1 Crude Birth Rate (C.B.R)

Birth rate means the total number of children born per thousand population in a particular area in a specific period. Birth rate is generally referred to as "Crude Birth Rate" because it relates to the birth rate of the entire population. Birth rate is a sort of rough measure compared to that which relates to more specific characteristics of a smaller population. The CBR can be found out as follows—

$$\text{Crude Birth Rate} = \frac{\text{Number of live birth in a year}}{\text{Population}} \times 1000$$

Suppose, the population of any area is 20,000, and the number of children born are 500, then CBR is-

$$\text{Crude Birth Rate} = \frac{500}{20{,}000} \times 1000 = 25$$

It shows that CBR per 1000 population is 25. Crude Birth Rates are different in many countries at different times because it is calculated after a particular month of the year. The data of live birth is based on registered births. But, all births are not registered generally and fertility is related to women, not the whole population. So, General fertility rate is essential.

2.4.2 General Fertility Rate (GFR)

The number of children born per year per thousand females in the age

group of 15-49 years is called general Fertility Rate. It is measured as follows :-

$$GFR = \frac{\text{Number of children during a year}}{\text{Number of females of age group 15-49 years}} \times 1000$$

If the number of female beloning to the age group 15-49 years in an area is 4,000 and total of live birth is 200 in a year, then

$$GFR = \frac{200}{4000} \times 1000 = 50$$

It means that there are 50 births per 1,000 women in the child bearing age group. But this measure of birth rate also has some defects because it ignores child bearing ages of women. According to Thompson and Lewis, the general fertility rate is usually four to five times high when the number of women in child bearing age is more. Therefore, Thompson and Lewis opined that, "these rates shouldn't be used in making a prognosis of probable future growth of population."

2.4.3 Mortality or Death Rate

Mortality rate is the number of deaths that occurs for each 1,000 people in a year. Just as birth rate is usually known as CBR, mortality rate is called Crude Death Rate (CDR). It can be measured as follows-

$$CDR = \frac{\text{Number of deaths in a year}}{\text{Population}} \times 1000$$

If the total population of an area is 25,000 and the numbers of death are 500, then

$$CDR = \frac{500}{25,000} \times 1000 = 20$$

It means that CDR is 20 per 1,000 people.

2.4.4 Infant Mortality Rate (IMR)

It is the number of children under one year of age who die in a year per 1,000 live births reported in the same year. It can be found in the following way -

$$IMR = \frac{\text{Number of deaths among infants}}{\text{Number of births}} \times 1000$$

If the number of registered death among infants in a specific year is 2800 and the number of registered births in the same year is 40,000, then

$$IMR = \frac{2800}{40,000} \times 1000 = 70$$

It means that 70 infants per 1000 newly born babies died in that particular year.

2.4.5 Net Migration Rate (NMR)

It is the difference between the immigrants (People coming in) and emigrants (people moving out) per 1,000 population. It can be shown as

$$NMR = \frac{\text{Immigration - Emigration}}{\text{Population}} \times 1,000$$

The rate of population growth means the increase or decrease in population during a year or a decade and is expressed in percent. It can be affected by the birth rate, death rate and migration. So, it can be measured as follows -

$$\text{Growth Rate} = \frac{\text{Birth rate - Death rate + Net Migration Rate}}{10}$$

Since birth rate, death rate and net migration rate are usually given per 1,000 in a population and the growth rate is given in percent and they are divided by 10.

2.5 TRENDS IN POPULATION GROWTH IN INDIA

India is one of the largest countries of the world in terms of population and area. It is the second most populated country in the world. The population of India is next to that of the China. India has 2.4 per cent area of the world and around 17.3 per cent of the world's population. According to the 2011 Census, the Indian population is 1,210,193,422 (1.21 billion) compared to a total of 1,028,737,436 in 2001. In absolute terms, the population of India has increased by more than 181 million during the decade 2001-11.

The first census was taken in India in 1871 and therafter, once in every 10 years. It is, therefore, possible to study changes in population size, structure and characteristics, etc. of Indian population. Since the ancient times, India had thickly settled population.

Table 2.1 Population of India and Decadal Growth

Years	Census Population	Deacdal Growth (per cent)	Average annual exponential growth rate (per cent)
1901	23,83,96,327	-	-
1911	25,20,93,390	5.75	0.56
1921	25,13,21,213	- 0.31	- 0.03
1931	27,89,77,238	11.00	1.04
1941	31,86,60,580	14.22	1.33
1951	36,10,88,090	13.31	1.25
1961	43,92,34,771	21.64	1.96
1971	54,81,59,652	24.80	2.20
1981	68,33,29,097	24.66	2.22
1991	84,64,21,039	23.87	2.16
2001	1,02,87,37,436	21.54	1.97
2011	1,21,01,93,422	17.64	1.64

(Source: Census of India, 2011)

The population of India was only around 238.4 million at the turn of the twentieth century. This has increased by more than four times in a period of one hundred and ten years to reach 1.21 billion in 2011. However, the population of India grew by one and half times in the first half of the twentieth century, while in the later half it recorded a phenomenal three-fold increase.

2.5.1 Decadal Growth in India

India's population growth can be classified into four distinct phases -

- 1901-1921 : Stagnant population
- 1921-1951 : Steady growth
- 1951-1981 : Rapid growth
- 1981-2011 : High growth with definite signs of slowing down of the growth rate.

During the nineteenth century, India witenessed a fluctuating and stagnant growth of population. This tendency drifted into the twentieth century until 1921. During 1901-1921, the population of India declined because of famines and epidemics, like cholera, influenza, malaria, plague, small pox, etc. The natural checks which are known to curb the growth of population were found to operate during 1911-21. An epidemic of plague took nearly three million lives. After the First World War, the entire country was swept by the epidemic of influenza. This epidemic may be considered the most severe and the most deadly of its kind because it took nearly 12 to 13 million lives during the short span of three or four months.

The period between 1921 and 1951 is known as the period of steady growth of population. During this period birth rate remained high but the death rate started decline. Moreover, some of the epidemics like cholera, plague, small pox were significantly controlled.

After independence, during 1951-1981, death rate remained high and consequently, there was very high growth of population.The under precedence growth of population during this period was mainly due to the accelerated development activities and improvement in the health facilities. The high birth rate and low death rate resulted into the rapid growth of population.

The period between 1981-2011 showed a declining trend in the growth rate of population. The health care facilities were extended even to the rural areas. During this period the birth rate declined rapidly from 34 per thousand in 1981 to 28 per thousand in 2011.

Table 2.2 Birth Rate and Death Rate of Population

Census Year	Birth Rate (Per thousand)	Death Rate (Per thousand)
1911	49	43
1921	48	47
1931	46	36
1941	45	31
1951	40	27
1961	42	23
1971	37	15
1981	34	12
1991	31	11
2001	26	9
2011	28	7

(Source: Census of India)

It is fact that the average death rates have sharply declined in each successive decades up to 1951, while birth rates have virtually remained unchanged up to 1961. The reasons for the decline of mortality may be due to the fact that ill effects of famines have been considerably reduced and have been brought under control. Public health measurse and advancement in medical science have further contributed to the reduction in mortality levels of India.

During the decade of 1981-91, the growth of population of India was 23.87 per cent and the average annual exponential growth rate was 2.16 per cent. Both these indicators of population growth are lower than those observed during 1971-81. The lowering of the population growth is continued during 1991-2001, with the decadal growth rate being 21.54 per cent and the average annual exponential growth rate being 1.97 per cent. During 2001-11, the decadal growth rate has become 17.64 per cent, a decrease of 3.90 per cent. It is significant that the percentage of decadal growth during 2001-2011 has registered the sharpest decline since independence.

The average annual exponential growth rate for 2001-11 has declined to 1.64 per cent per annum from 1.97 per cent per annum during 1991-2001.

Though the growth rate of India's population is declining, still it appears to be high. On the other hand, there are other developing countries, like, Pakistan, Nepal, Bangladesh, with even higher growth rates. The birth rates of these neighbouring countries and other Asian Countries are also higher as compared to that of India. However, it

needs to be noted that the base population of India is so large that even a low growth rate leads to substantial additions to the population in absolute numbers.

2.5.2 Composition of Population of India

The age and the sex structure of the population are the most important demographic characteristics that are captured by a census of a population. Age and sex are two attributes that largely influence an individual's role in society.

- *Sex composition*: Sex composition of the human population is one of the basic demographic characteristics, which is extremely vital for any meaningful demographic analysis. Changes in sex composition largely reflect the underlying socio-economic and cultural patterns of a society in different ways

  According to 2011 Census, out of a total population of 1,21,01,93,422 persons, 62,37,24,248 are males and 58,64,69,174 females. As per, the number of females per 1,000 males is 940. In India, sex ratio in the total population has always remained unfavourable to females. Since 1901 there has always been excess of males over females. It is interesting to note that the proportion has consistently been declining throughout the last hundred and ten years.

Table 2.3 Trend of Sex Ratio in India

Census Year	Sex Ratio
1901	972
1911	964
1921	955
1931	950
1941	945
1951	946
1961	941
1971	930
1981	934
1991	927
2001	933
2011	940

In the pre-independence period, the sex ratio declined consistently up to 1951. In the post-independence period, the trend continued and the sex ratio slipped down for two consecutive decades after 1951 to reach 930 in 1971. After 1971, trends were not consistent, showing increase and decrease in each consecutive year. It has marginally increased to 933 in 2001 and then in 2011, it has become 940 females per thousand males.

The Census authority in India has cited some common reasons for uneven sex structure of India -

- Neglect of girl child resulting in higher mortality at younger ages
- High maternal mortality
- Sex selective female abortions
- Female infanticide
- Change in sex ratio at birth.

- *Age Composition*: The age structure of a population, that is, the distribution of the population in different age groups, constitutes an important subject of demographic analysis and development planning. Age structural dynamics includes fertility, mortality and as well as related changes in family planning and social arrangements. The use of age-structure goes beyond demographic analysis to other important areas. Public polices aim to improve the welfare of a population; population welfare in turn is determined and shaped by the needs of present and future population.

  The age composition of India's population according to Sample Registration System (SRS), shows that there has been a gradual decline in the share of population in the age group 0-14 from 41.2 to 38.1 per cent during 1971 to 1981 and 36.3 to 29.5 percent during 1991 to 2011, whereas, the proportion of economically active population (15-59 years) has increased from 53.4 to 56.3 percent during 1971 to 1981 and 57.7 to 62.5 per cent during 1991 to 2011. On account of better education, health facilities and increase in life expectancy, the percentage of elderly population (60+) has gone up from 5.3 to 5.7 percent and 6.0 to 8.0 percent respectively during the periods under reference.

  As per the Census 2011, the total number of children in the age group of 0-6 years is 158.8 million. It is significant that out of the absolute increase of 181 million in the country's population during the decade 2001-2011, 88 per cent

has been contributed by the child population in the age group of 0-6 years. During 2001, the total number of children in the age group of 0-6 years was about 163.8 million, about 5 million more than the number recorded in 2011. In other words, proportion of child population in the age group of 0-6 years to the total population during 2011 is 13.12 per cent while in 2001 it was 15.93 per cent. The decline has been 2.8 points which is a positive sign. In general, the proportion of population below 15 years is showing decline, whereas the proportion of elderly population in the country is increasing.

W CHECK YOUR PROGRESS

Q 1: What are the factors of population growth ?

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Q 2: Why does birth rate increase ?

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Q 3: Why does fertility rate high ?

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Q 4: What is mortality ?

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Q 5: In which year the first census was taken in India?

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Q 6: Write the some common reasons for uneven sex structure of India as cited by the Census Authority in India.

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Q 7:What are underlying causes of increasing the number of elderly persons during the last two decades?

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2.6 FACTORS INFLUENCING POPULATION GROWTH IN INDIA

India is an over-populated country because the growth of its population is much faster than the rate of its economic development. There are various factors that influence population growth in India.

- ***Decrease in Death Rate*:**The fall in death rates that is decline in mortality rate is one fundamental causes of overpopulation. Owing to the advancements in medicine, man has found cures to the previously fatal diseases. The new inventions in medicine have brought in treatments for most of the dreadful diseases. This has resulted in an increase in the life expectancy of individuals. Mortality rate has declined leading to an increase in population.

  Owing to modern medications and improved treatments to various illnesses, the overall death rate has gone down. The brighter side of it is that we have been able to fight many diseases and prevent deaths. Improved public health practices is the significant factor that affects the growth of population.
- ***Rise in Birth Rate*:** Another important cause of higher growth of population is the rise of birth rate. Due to advancement of medical science, the country's death toll has decreased and rate of birth has increased which led to population explosion in India. Moreover, the average life span of the Indians has increased and therefore, the proportion of women surviving to the mean age of reproduction has also increased.
- ***Migration*:** Another factor contributing to over population is the migration of people from rural to urban areas. In the metropolitan areas, growth of population has been phenomenal. There has been a rapid increase in the youth population seeking admission into schools and colleges and employment..
- ***Lack of Education*:** Illiteracy is another important cause of overpopulation. Those lacking education fail to understand the need to prevent excessive growth of population. They are unaware of the ways to control population. Lack of family planning is commonly seen in the illiterate. This is one of the major factors leading to overpopulation. Illiteracy and lack of awareness of availability and use of family planning methods has resulted in a high growth of population, especially in rural areas.
- ***Desire for Male Child*:** There is a belief in Hindu religion that a male child is a means for attaining salvation and to carry forward the family name. In addition, there is also a belief that a son will look after his parents in their old age. Hence, couples desire to have a male child. Thus, many couples having few daughters go on producing children in the hope of being

blessed with a son.

- ***Marriage at Low Age*** **:** Early marriage of Indian women is another factor that adds momentum to the high rate of population growth. Since the age at marriage is low, the fertility or reproductive period of adults is long. and the chances of having more number of children is high. The minimum permisssible age of marriage of an Indian women is 18 years and for men is 21. However, it is estimated that 26 per cent of the females marry at the age of 15 and 54 per cent marry before they reach 18 years.

2 2.7 LET US SUM UP

- The term 'population growth' refers to how the number of individual in a population increases or decreases with time .
- The population in India has been growing continuously due to declining general mortality rate and increase in the expectation of life at birth and high fertility rate.
- India is the second most populated country in the world. It has 2.4 per cent area of the world and around 17.3 per cent of the world's population.
- The most important determinants of population growth are birth rate, death rate and migration. Increasing population at an alarming rate is the result of high birth rate.
- High birth rate is high due to people's illiteracy, absence of family planning knowledge, early marriage, social belief and custom, attitude towards children etc. Fertility of human being is also another remarkable aspect and accounts for high birth rate.
- According to the 2011 Census, the Indian population is 1,210,193,422 (1.21 billion) compared to a total of 1,028,737,436 in 2001.
- Crude Birth Rate, General Fertility Rate, Mortality or Death Rate, Infant Mortality Rate, Net Migration Rate are some of the tools that determine or measure the determinants of population growth.
- India's population growth can be classified into four distinct phases - Stagnant population (1901-1921), Steady growth (1921-1951), Rapid growth (1951-1981), High growth with definite signs of slowing down of the growth rate (1981-2011). The first two decades was the period of stagnant population. There are high mortality during this period. The period between 1921 and 1951 is known as the period of steady growth of population. The birth rate during this period remained high but the death rate started to

decline. In 1951-1981 ther was very high growth of population. The last phase showed a declining trend in the growth of population.

- Though the growth rate of India's population is declining, still it appears to be high. It is due to the fact that the base population of India is so large that even a low growth rate leads to substantial additions to the population in absolute numbers.
- The age and the sex structure of the population are the most important demographic characteristics that are captured by a census of a population. Changes in sex composition largely reflect the underlying socio-economic and cultural patterns of a society in different ways.
- The age structure of a population, that is, the distribution of the population in different age groups, constitutes an important subject of demographic analysis and development planning.
- Various causes, namely, decline in death arte, increase birth rate, migration, illiteracy, can be attributed to the high growth of population in India.

2.8 FURTHER READING

1) Bhende, Asha, A. and Tara Kanitkar. (2006). *Principles of Population Studies*. Mumbai: Himalaya Publishing Hopuse.

2) Raj, Hans. (1990). *Fundamentals of Demography (Population studies with special reference to India)*. Delhi: Surjeet Publications.

3) Sinha, V.C. and E. Zacharia. (2007). *Elements of Dempgraphy (With Demographic Profile of India and the World)*. New Delhi: Allied Publishers Pvt Ltd.

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2.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Population growth is primarily caused by natural increase ,that is , the

excess of births over deaths .But in any particular region ,migration is caused the population growth when the amount of immigration exceeds the amount of emigration .So ,birth rate , death rate and migration are the main factors of population growth.

Ans to Q No 2: Birth rate increases due to people's illiteracy , absence of family planning knowledge , early marriage , social belief and customs ,attitude towards male child etc.

Ans to Q No 3: There are various socio-economic and physical factors which encourage to increase the higher fertility in India. Some of these are –universality of marriage ,early marriage, higher family norm ,preference for sons ,low economic status , high infant mortality, occupation with agriculture ,lower urbanization ,cultural resistance to change etc.

Ans to Q No 4: Mortality means death .Death is defined as the permanent disappearance of all evidence of life at any time after birth has taken place. Thus , death does not include abortions and still births

Ans to Q No 5: The first census was taken in India in 1871.

Ans to Q No 6: Some common reasons for uneven sex structure of India as cited by the Census Authority in India are -

- Neglect of girl child resulting in higher mortality at younger ages
- High maternal mortality
- Sex selective female abortions
- Female infanticide
- Change in sex ratio at birth.

Ans to Q No 7:The underlying causes of increasing the number of elderly persons during the last two decades are better education, health facilities and increase in life expectancy.

2.10 MODEL QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: Describe the determinants of population growth.

Q 2: Explain the factors that influence population growth in India.

Q 3: Though the growth rate of India's population is declining, yet the number of populations are increasing. Why?

Q 4: How do you measure or assess the birth rate, mortality rate in one area.

B) Long Question (Answer each question in about 300-500 words)

Q 1: Write on the decadal growth of population in India.

Q 2: Discuss the population trend of India after Independence.

Q 3: Discuss the factors influencing population growth in India.

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