

# INCREASING POPULATION – ITS IMPACT ON THE ENVIRONMENT



## SYLLABUS

1. Reasons for sharp rise in world population.
2. Trends of population growth in India
3. Factors responsible for population explosion in India
4. Impact of increasing population on the environment.
5. Impact of increasing population on our resources.

## INTRODUCTION

*Population* means a set of humans in a given area, like a village, town, state or a country or even all humans inhabiting the planet earth.

In 1000 A.D., the world population was probably about 300 million (3000 Lakh). At that time, the motto of human beings might have been “Go Forth And Multiply”. That is what the human population has successfully been doing for hundreds of years — expanding, utilizing, civilizing, industrializing, and now “destroying the very land upon which we live”.

In early 19th century, the world population rose to 1000 million (1 billion), and hit the 6.5 billion mark in 2006. On an average, each year the world population increases by about 80 million. Towards the end of 2011 the total crossed seven billion, having more than doubled since 1965. According to recent projections by the United Nations, it is

projected to rise to 9.3 billion in 2050. It is estimated that by 2100, India (1.7 billion) is forecast to overtake China (1.4 billion). Together these two countries may then account for over a third of the global population.

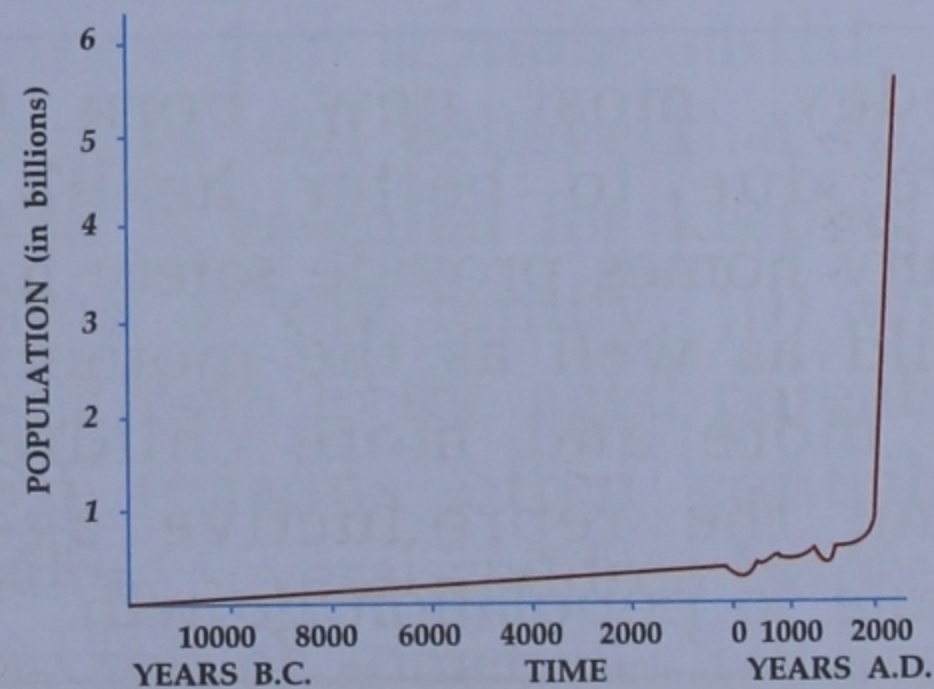


Fig. 8.1 Increase in population over the year

**Population Explosion — Why ? :** If a population is to grow, the birth rate must be higher than the death rate. Suppose a population of 1000 people produces 100 babies each year but only 50 people die each year. This means 50 new individuals are added to the population each year and the population will double in 20 years

(if the new individuals start reproducing at 16 years of age).

The abrupt rise of world population has been termed as "Population Explosion".

### Reasons for population explosion in recent times

- 1. Fewer infant mortality :** One of the reasons affecting the size of population is infant mortality, *i.e.*, the death rate for children less than one year old. Population in the developing world is growing, not because of an increase in the number of babies born per family, but because more babies are surviving to reach reproductive age. Infant mortality is falling and more people are living longer. That is, **life expectancy** is increasing.

**Life expectancy** is the average age to which a new born baby is expected to live.

Today, most new born babies survive due to better health care. Maternity homes provide safety for both the child as well as the mother. As a result, more and more children are reaching the reproductive age and contribute to population growth.

An increase in the number of people over the age of 60 does not change the rate of population growth much, because these people have passed child-bearing age. On the other hand, if death rate among children falls and the extra children survive to reproduce, the population will continue to grow. This is one major reason for the rapid increase in the population world over.

- 2. Better health care :** Agricultural development and economic expansion led to the improvement in nutrition, housing and sanitation, and to clean water supplies. There are more health care centres, hospitals available for help. These improvements reduced the incidence of infectious diseases in the population. Not only this, better-fed children could also resist these infectious diseases.

Traditionally, it is assumed that the population growth is limited by famine, disease or war. Undoubtedly, these factors are affecting local population in some parts of the world, but they are unlikely to have a limiting effect on the rate of overall population growth.

- 3. Fewer deaths :** Due to discovery of modern drugs and improved medical techniques, particularly immunization, many diseases have been controlled or even wiped out. Diseases like diphtheria, tuberculosis and polio are now quite rare. Small pox has been wiped out by the World Health Organisation Vaccination Programme.

Pulse Polio programme is another such campaign to totally eradicate this deadly disease.

- 4. Food scarcity minimized, and improved nutrition :** Better and scientific practices in agriculture, more food is produced and safely stored. Thus there are only few starvation deaths. People and specially the children, by and large, are getting healthier food with the result that they suffer less from diseases and live longer.

## TRENDS OF POPULATION GROWTH IN INDIA

The trend in the rise of population in India is alarming. Except for a slight fall in 1911-21, the population of India has been steadily increasing for the last 100 years. Since 1951, the growth rate has been very high. The table given below shows this trend during the last hundred years :

Year	Approximate population of India (in millions)
1901	238
1911	252
1921	251
1931	279
1941	318
1951	369
1961	439
1971	548
1981	685
1991	846
2001	1027
2011	1210

A few years ago, it was estimated that India's population in 2001 would be around 760 million but now, we find that it has already crossed 1000 million (one billion).

The population in 2010 was about 1050 million and is growing approximately at the rate of —

- 52 per minute
- 3,020 per hour
- 72,480 per day
- 2.74 crore per year

## FACTORS RESPONSIBLE FOR POPULATION GROWTH IN INDIA

Some factors responsible for growth of population in India are :

- **Illiteracy** : Most of the rural population is still illiterate, ignorant and superstitious. So they think a child is a gift of the God.
- **Mortality rate** : Due to high infant mortality rate in our country, people from economically weaker section think it safer to produce more children so that at least some may survive.
- **Economic reasons** : People from low income group think more children will help in enhancing the income of the family.
- **Religious and social customs** : People in India believe in various religious and social customs, and as such many do not accept family planning norms.
- **Desire for a male child** : Many families still believe that (i) a male child is essential for keeping up the name of the family, (ii) will be a great help to the aged parents. These two reasons often contribute to getting several children before getting one son or sometimes not even that.
- **Lack of recreation** : Poor standard of living and poverty provide no recreation other than sex.

## PROBLEMS DUE TO POPULATION EXPLOSION

Increase in population in a country beyond its means, may cause many problems, *for example* :

- Per capita income of the people comes down.

- Natural resources like land, minerals, wood, fuel, etc. decrease.
- General health of the people goes down.
- Overall, the quality of life of the people goes down.

## POPULATION INCREASE AND ITS IMPACT ON THE ENVIRONMENT

Population increase in the last 300 years has had three main effects on the environment.

1.

### Intensification of agriculture:

Forests and woodland are cut down and the land so recovered is used to grow more food



*Fig. 8.2 Cutting of forest (Deforestation)*

(Fig. 8.2). This destroys important wild life habitats and may affect the climate too.

The use of chemical fertilizers can cause deterioration of the soil structure, and results in pollution of rivers and streams. Application of pesticides also kills beneficial forms of life.

2. **Urbanization** : The development of towns and cities makes less and less land available for wild life (Fig. 8.3). In addition, the crowding of the growing population in towns leads to problems of waste disposal. The sewage and domestic waste from a town of thousands of people can cause

diseases and pollution in the absence of effective means of disposal.



*Fig. 8.3 Cutting a road to develop a city, destroys the natural vegetation*

In big cities air too get polluted when fuels are burned for heating and transport.

3. **Industrialization** : Increase in population has led to the increase in the number of manufacturing factories and industries which produce gases and other waste products which damage the environment (Fig. 8.4).



*Fig. 8.4 Industrial development causes environmental pollution.*

The effluents released from these industries into ponds and rivers may pollute the water (Fig. 8.5), and can cause the death of aquatic flora and fauna (Fig. 8.6).



Fig. 8.5 Effluents from industries pollute water



Fig. 8.6 Water pollution causes death of aquatic fauna

So, we have to control our consumption of earth's resources, limit our own numbers, and treat our environment with more care and understanding, only then we can make this earth worth living, otherwise we may lead to our own extinction.

### INCREASING POPULATION — ITS IMPACT ON OUR RESOURCES

You have learnt that the increase in the human population results in the undue pressure over the resources. The main resources where production falls short of the demand are as follows.

**1. Food :** One of the most important need of humans is food. Although humans have been discovering better and

better methods to produce more food, yet it cannot be in the same proportion as the rise in population.

If unchecked, the number of people are increasing in **geometrical progression**, more or less in a pattern of 1, 2, 4, 8, 16, ..... i.e., the numbers at each step are being **multiplied**. Compare this with the growth in food production. By bringing more land under cultivation and by using better farming methods, food production rise in **arithmetic progression** in a pattern of 1, 2, 3, 4, 5, ..... i.e., by **adding up** at each step. **This indicates that food would be running short for the unchecked rising population.**

- 2. Land :** Man has been bringing more and more land under cultivation and also using up land for building more residential colonies, factories and industries. Due to human settlements, 16 million hectares of forests are chopped down each year.
- 3. Forests :** Forests are in a way the most important natural resource.
  - They provide us timber, firewood, resins, medicines, wood for variety of factories.
  - In addition, they are the main contributors of the life sustaining gas — oxygen. Oxygen given out during photosynthesis purifies the air too.
  - They bring rain (adding moisture to the atmosphere through transpiration).
  - They prevent floods (by holding soil particles firmly).

- They stabilize climatic conditions by absorbing and utilizing carbon dioxide during photosynthesis.
- They are the natural homes for a huge variety of wild animals. By destructing the natural habitats of many species, people are invading their habitats, replacing them to unsuitable places and leading the native species to the extinction.

**Deforestation** (cutting down of forests) has been one of most serious consequences of rising population. This, they do to get land for cultivation and housing and to obtain timber and wood. Deforestation leads to serious problems — droughts, floods, soil erosion, *etc.*

Forests are one of our renewable resources. By careful management and by **afforestation** (planting more trees), we can maintain and even improve the existing forests.

4. **Water** : Availability of clean and germ-free water for drinking purpose would be more and more scarce with the increase in population. The reason would be mainly the pollution of rivers, lakes, and ponds. Water necessities will increase more than 20% by 2025.
5. **Energy** : We need energy for cooking, for running factories, for transportation, and so on. Two major sources of energy at present are **coal** and **petroleum**. These are termed **fossil fuels** and their reserves underground are fast depleting. It is estimated that at the current rates of consumption —
  - the reserves of petroleum may exhaust within 150 years.
  - coal may last a bit longer.

Once finished, petroleum and coal will take thousands of human generations to form again.

Coal and petroleum are categorized as **conventional sources of energy** because these have been in use since long.

These days, non-conventional sources of energy, such as solar energy, nuclear energy, tidal energy or wind energy, are being tried. But none has proved to be commercially viable till now. Nuclear energy has its own safety problems due to radiations, *etc.*

One great inexhaustible source is **solar energy** which is yet to be tapped for larger utilization. **Solar cookers** and **solar batteries** to harness solar energy, and biogas produced from organic wastes (cow dung, farm wastes and sewage, *etc.*) are already in use and have to be further popularized.

## 6. Mineral Resources :

- Minerals are the non-renewable resources. Once finished, they can never be replaced.
- Man has been mining scores of metals, such as iron, copper, tin, magnesium, aluminium, gold, silver, *etc.* Copper resources may be finished in about 100 years. More population means more consumption, more industries, more means of transportation and all of these would require more minerals. Thus, we need to slow down in consuming our resources. We have to get cautious now, or else only will be facing some disastrous consequences of nature.

## REVIEW QUESTIONS

### MULTIPLE CHOICE QUESTIONS

1. Choose the correct option :

- (i) Which one of the following has not been a reason of sharp rise in world human population ?  
 (a) Fewer infant mortality (b) Better health care  
 (c) More death at young stage (d) Improved nutrition.
- (ii) In which year, there was a slight fall of human population in India?  
 (a) 1921 (b) 1941 (c) 1951 (d) 1991
- (iii) Factor responsible for the population explosion in India has been  
 (a) Literacy (b) Desire for a female child  
 (c) More chances for recreation (d) Mortality rate less
- (iv) Which one of the following resources is not affected by increasing population?  
 (a) Land (b) Forests (c) Minerals (d) Air

### SHORT ANSWER QUESTIONS

1. Write true (T) or false (F) in the following statements :

- (i) Infant mortality rate has been one of the reasons affecting the rise in population.
- (ii) Life expectancy is the average age to which an adult man can be expected to live.
- (iii) The human population in 2010 was growing approximately at the rate of 20 per minute.
- (iv) Increase in population leads to decrease in industries.

2. Complete the following sentences

- (i) Forests are the main contributors of life-sustaining gas known as .....
- (ii) Cutting down of forests or ..... has been the more serious consequence of rising population.
- (iii) By ....., we can maintain and even improve the existing forests.

3. What meant by the term "Infant mortality" ?

4. Define the term "**life expectancy**".

5. Mention *one* programme which aims to eradicate one of the deadly diseases.

6. How has the desire for a male child led to the population growth in societies. Briefly discuss.

7. Differentiate between '**deforestation**' and '**afforestation**'.

8. List any *five* resources which are adversely affected by the increasing human population.

9. List any *three* problems created due to population explosion.

### LONG ANSWER QUESTIONS (Write the answers in your note-book)

1. Give examples of the kind of demand that an increasing population makes on the environment.

2. Write any *three* causes due to which human population has increased world over.

3. Briefly explain the term '**Population explosion**' ?

4. Improved nutrition can be one of the reasons for population growth. Discuss.

5. Increase in the population in a country beyond its means may cause many problems. Mention any *three* such problems.