12 Population — The Increasing Numbers and Rising Problems

Syllabus : Population : Problems posed by the increase in population in India; need for adopting control measures – Population control.

Scope of Syllabus : Main reasons for the sharp rise in human population in India and in the world. The terms demography, population density, birth rate, death rate and growth rate of population should be explained. With population growth, increased consumption and urbanisation there is a need to keep a check on demands of urban areas over rural areas of exploitative use of resources rather than sustainable use. Methods of population control to be taught.

Human population throughout the world and in India, in particular, has been rising at an alarming rate. This is by far the most serious problem the world is facing today, and if not solved, will lead to grave consequences in future. What all this problem of rising world population embodies and what steps may help to solve it, are the topics covered here.

12.1 RISING POPULATION — A GLOBAL THREAT

Today, we hear a lot about population problem in the developing countries including India. All the media of mass communication — radio, television, stage, press, etc. — are trying their best to educate people about the grave dangers of rising population. It is becoming a serious threat, not for any one country in particular, but for the world as a whole.

12.2 WORLD POPULATION THROUGH THE AGES

It is estimated that the total world population about 50,000 years ago would have been around one million (1,000,000). At that time, man lived a very primitive life. He knew nothing about farming, but he had begun to use tools which he made from stones, sticks and bones (Fig. 12.1.) He was a wanderer and took shelter in caves. He used to kill animals and eat them raw or roast them on fire. He used to catch fish from waters. He collected eggs from birds' nests or gathered fruits, roots and leaves from wild plants. Meanwhile, due to safety reason, he had learnt to live in groups and to use his intellect in many ways as in hunting large animals like the mammoths. He had improved his tools which were still mainly of stones **(stone age)**. This **tool-making revolution** thus helped man to improve his life.

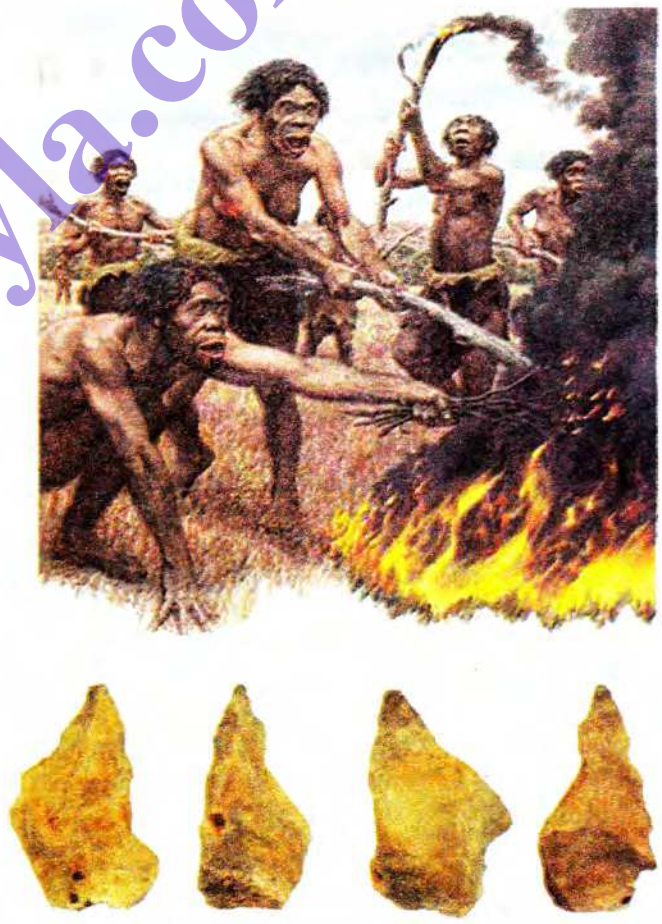


Fig. 12.1 : A primitive human species (*Homo erectus*), of the stone age (about 1 million years before) who lived in caves and hunted animals, and some of the stone tools which he used for hunting and for scraping flesh from the killed animals

Fig. 12.2 : An artist's perception of a late stone age family

About 10,000 years ago, the total world population had reached approximately 5.3 million. At that time, the human way of life was undergoing a remarkable change — a kind of revolution.

- He started living in **settled communities** in primitive huts.
- He had **started domesticating animals — dog being the first.**
- He learnt to sow crops and store food. This was the beginning of **agriculture.**
- His primitive stone tools and weapons were now gradually replaced by those of bronze and iron. He had thus stepped into the **metal age.**

As a result of all the above progress, the human population began to grow faster.

WORLD POPULATION
- Some important dates and figures -

- World population crossed the 5.0 billion mark on July 11, 1987.
- World population in 1995 was nearly 5.6 billion.
- Number of babies born every day is more than 1,00,000.
- October 12, 1999, The World Population crossed the 6,000,000,000 (six billion) figure. The six billionth member of the world population was born in Sarajevo (Yugoslavia).

According to one estimate the total world population will reach 10 billion around the year 2050.

With the present trend of population growth, India is overtaking China to becoming World's "TOP MOST" in population by the year 2025 or so.

JULY 11 IS OBSERVED AS WORLD POPULATION DAY

12.3 RAPID RISE IN POPULATION

(i) Industrial revolution

A major phase in the growth of human population started with the **scientific** and **industrial revolution**, which began around the seventeenth century. Rapidly growing industries made human life more and more comfortable, with greater opportunities of jobs and with more production of food. All this favoured population rise. However, there was one drawback. As the community groups were increasing, there were **widespread outbreaks of infectious diseases** due to close contact of the people. **Nutritional diseases** also appeared due to unbalanced diets.

(ii) New Discoveries in Medical Science

The twentieth century (1901-2000) witnessed remarkable discoveries in medical science, specially the **antibiotics** and the prophylactic **vaccinations** against many diseases ("prophylactic" means guarding beforehand). This resulted in a sharp reduction in the number of deaths of all age groups, specially the infants and the old. ***More children per family began to reach the reproductive age*** and as they reproduced, the rate of growth of population began to rise very rapidly.

The two big question marks (??). Figure 12.3 depicts a diagrammatic curve of the growth of human population where three main revolutions in human culture have been indicated : (1) **Tool making revolution** (2) **Agricultural revolution** (3) **Scientific industrial revolution.**

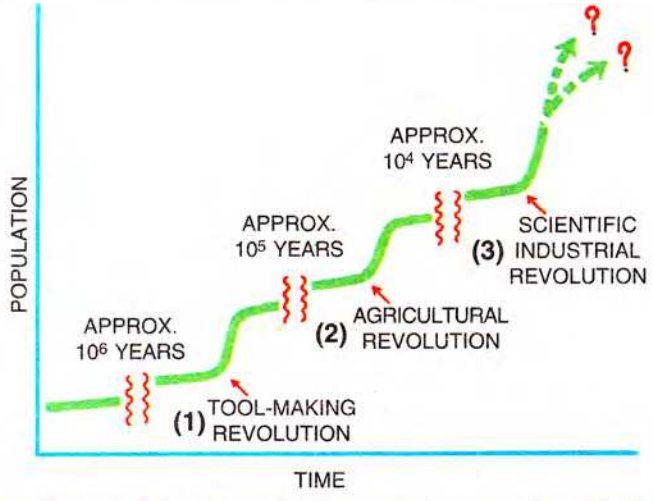


Fig. 12.3 : Three great cultural revolutions, each of which favoured steep rise in human population

Each cultural revolution was followed by a rapid rise in population till it became somewhat stabilised or rose very slowly (flattened curve) for a long period (shown by wavy gaps). The next revolution provided further improved means of livelihood and the human population again moved upward rapidly, and so on.

The modern period is marked by the end of the solid curve; we do not know exactly whether the population would continue to rise rapidly or slowly, or would soon tend to stabilise, and hence the two big question marks.

? PROGRESS CHECK

1. Name the three great cultural revolutions that favoured a steep rise in population.
   .....
2. Mention two areas of medical sciences which have indirectly contributed to high growth in human population.
   .....
3. Is the present day human population growth following a J-shaped curve or S-shaped curve?
   .....

12.4 POPULATION EXPLOSION — A SERIOUS GLOBAL CONCERN

According to demographers, about one-third of the total number of all the people who have ever lived on earth are alive today, is termed as population explosion that began in the middle of the nineteenth century. Two-thirds of the present world population belong to the developing nations where more than half the people live below poverty line. India and China make one-third of the total world population. Figure 12.4 represents the profile of human population growth in the world from the earliest times, particularly during the last 12,000 years. In earlier years, the human population remained fairly constant. The sharp dip shortly after 1000 A.D. is due to severe epidemics, specially the Black Death (Plague, caused by a bacterium spread by the ratflea bite). Later, the scientific and industrial age gave a fresh momentum to the population rise. Today, the rate of growth of population has reached a point such that the **population more than doubles in about 35 years**. The total world population reached 7 billion on 31 October 2011. According to the present rate of population grown, it is likely to reach 50 billion by the end of this century (more than seven times the present number)

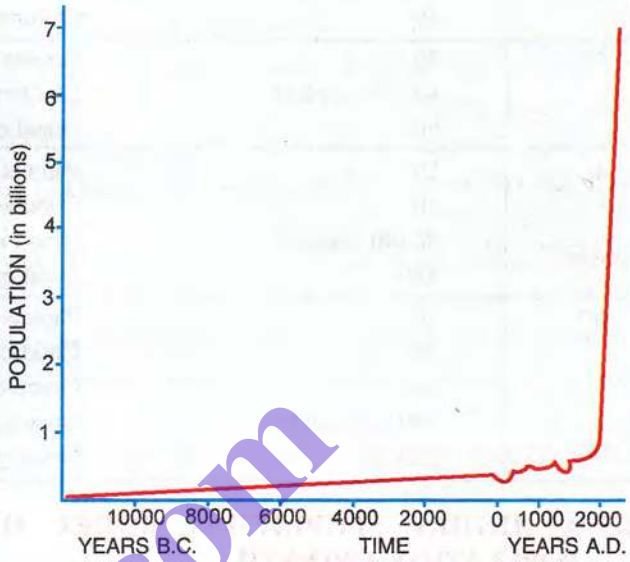


Fig. 12.4 : The world population during the last twelve thousand years

Six main reasons for sharp rise in WORLD HUMAN POPULATION in the recent past.

1. **Better health care**, for all age groups. There are more health care centres, hospitals, and practising doctors available for help.
2. **Fewer deaths** due to better medical aid. This is for two reasons : there are regular vaccination programmes, many diseases have been controlled or even wiped out and secondly, more patients get cured and live longer.
3. **Food shortages minimised** and green revolution. More food is produced and stored. There are very few starvation deaths.
4. **Improved nutrition** (due to consciousness) specially for growing children. They keep healthy, suffer less from diseases and live longer.
5. **Large scale immunisation** against fatal diseases.
6. **Fewer infant deaths**. In older times, an average family used to get 4-6 children out of which, 1 or more would not survive due to certain diseases. 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 of all the above factors, even if a couple produced only 2-3 children, the total population rises sharply.

   More and more children are reaching the reproductive age and they contribute to population growth.

Table 12.1 : A model of population growth
[In about half a century the population tends to grow 10 times]

Year	Number of individuals	Generation	Age (years)	Total population
1	20 (10 couples)	Parents	20-30	60
	40	Children	0-10	
20	20	Parents	40-50	
	40 (20 couples)	Children	20-30	140
	80	Grand children	0-10	
40	20	Parents	60-70	
	40	Children	40-50	300
	80 (40 couples)	Grand-children	20-30	
	160	Great grand-children	0-10	
60	20	Parents	dead	
	40	Children	60-70	
	80	Grand-children	40-50	600
	160 (80 couples)	Great grand-children	20-30	
	320	Great, great, grand-children	0-10	

12.5 A HIGHLY SIMPLIFIED MODEL OF POPULATION GROWTH

The table above (Table 12.1) gives a model of growth of population. We have imagined a population of 20 (10 couples) who have an average of 4 children. When they grow up and reach the reproductive age of 20-30 years, they too pair off and again have four children, and so on in each generation. The total population after the fourth generation at the end of 60 years, has multiplied ten times.

At this rate, we in India have already numbered more than 1.21 billion and would overtake China in the year 2025 or so, to become TOP MOST in population — something not to be proud of at all. Can we afford such a rise in population ? Can our resources — food and other requirements of life — keep pace with rising population ?

1 square foot of earth per person !

If there are no further checks or controls, the population in the next 700 years would become so much that only 1 sq. foot of earth per person would be available. Can this situation really come ? If not, what would be the cause of this? No one can answer at present.

Need for adopting control measures

With the fast increasing world population there are numerous problems which are serious threats, for example :

1. Decreasing open spaces,
2. Shrinking of forests,
3. Increasing industrialisation causing air, water and soil pollution,
4. Rapid and intense shortage of drinking water and other resources,
5. Increasing pollution is a health hazard.

In order to reduce the above threats, it is urgently required to control population growth. And this can be achieved only by taking population control measures primarily in the form of methods of contraception.

12.6 POPULATION IN INDIA

The trend of rise of population in India is as alarming as in the rest of the world. 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 ten-year interval statistics during the last 110 years is as follows :

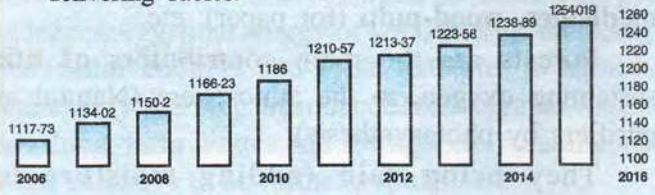
Year	Approximate population of India (in millions)	Year	Approximate population of India (in millions)
1901	238	1961	439
1911	252	1971	548
1921	251	1981	685
1931	279	1991	846
1941	318	2001	1027
1951	369	2011	1210

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

Some latest figures about population in India are as follows :

Current Indian population is a little more than 1·32 billion and is growing rapidly :

- 52 per minute
- 3,120 per hour
- 74,480 per day
- 2·7 crore per year
- At least, 35 out of every 1,000 babies born die at birth.
- 45 out of 1,000 babies born do not survive beyond the age of five.
- More than 100 pregnant women per 1,00,000 die while delivering babies.



THE BILLIONTH INDIAN

Officially designated billionth Indian, "Aastha" was born on Thursday, May 11, 2000 at 11.40 A.M. at Safdarjung Hospital, New Delhi. This is the picture of the newly born Astha.

Astha — when six years old. She aspires to become a doctor.

The Seven Billionth World Baby of India

Hundreds of children are born every day and every hour in the world. One *seven billionth baby* born in India is Nargis, born in a village near Lucknow (U.P.) at 7.20 A.M., on 31 October, 2011. Internationaly, the population milestone is the baby born in Manila (Phillipines) where the sun rises almost earliest in the world related to International Date Line.

The 23 years old Vinita Yadav holding the world's 7 billionth girl Indian child Nargis born on 31 October, 2011.

12.7 FACTORS RESPONSIBLE FOR POPULATION EXPLOSION IN INDIA

(1) **Illiteracy.** Most of the rural population which forms the bulk of our society are still illiterate, ignorant and superstitious. They also do not know the functioning of the human reproductive system.

(2) **Traditional beliefs.** Among the people from lower strata of society, children are regarded as a gift of God and a sign of prosperity. Therefore, they make no effort to avoid pregnancy.

(3) **Mortality rate.** Due to high infant mortality rate in our country, people from the economically weaker section think it safer to produce more children so that at least some may survive.

(4) **Economic reasons.** Children are considered to be helping hands to increase the family income.

(5) **Religious and social customs.** India is a centre of various religious and social customs, and as such most people do not accept family planning norms.

(6) **Desire for a male child.** Most Indian families still hold the view that a male child is essential for keeping up the name of the family. Further, a male child is usually 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.

(7) **Lack of recreation.** Poor standard of living and poverty provide no recreation other than sex.

World-wide population trends

1. **Birth rates are falling**

	World	China	India	U.S.
1970-1975	4.7	5.8	5.4	2.5
2005-2010	2.6	1.4	2.8	2.1

Which one of the three countries mentioned above has reduced the birth rate maximally ?

2. **People are living longer**
   — Better nutrition
   — Better healthcare

   Once an adult has reached the age of 60, he/she can expect the following more years of full health.
   - 13 years in **India**
   - 15 years in **China**
   - 19 years in **U.S.**

PROGRESS CHECK

1. Write any six factors which have contributed to a rapid rise of human population in recent times in the world.
2. Give the approximate figures for the population in India in million at (a) the beginning and (b) the end of twentieth century.
   (a) ..... (b).....
3. List any four reasons for the population explosion in India.
   .....

12.8 RISING POPULATION — PRESSURE ON NATURAL RESOURCES

What is a resource ?

Resource is any substance (natural or artificial), energy or organism which is used by humans for their welfare.

In the context of rising human population, the six main resources under pressure are as follows :-

1. Food
2. Water
3. Land
4. Forests
5. Energy
6. Minerals

With the rise in population, their production falls far short of the demand.

1. FOOD

One most important need of humans (or any living organism) is food. It is true that humans have been discovering better and better methods to produce more food, but 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 rises 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.*

Production of food rises by arithmetic progression. Population grows by geometrical progression.

2. 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, ponds, lakes, etc.

3. LAND

Man is bringing more and more land under **cultivation** and also using up land for **building more residential colonies, factories and industries**. Usable land would thus become less and less available.

4. FORESTS

Forests are in a way, the most important natural resources. They provide us **timber, firewood, resins, medicines, wood-pulp** (for paper), etc.

Forests are the main contributors of life-sustaining **oxygen,** to the atmosphere (Natural air purifiers by photosynthesis).

They **bring rain (adding moisture by transpiration)** and at the same time, **prevent floods** (by holding soil particles firmly).

They **stabilise climatic conditions** including atmospheric temperature (by absorbing CO_2).

Forests are *natural homes* for the immense variety of large and small wild animals.

Deforestation (cutting down of forests) has been one of the most serious outcomes of rising population – to get land for cultivation and housing and to obtain timber and wood. Deforestation has led to numerous other problems such as :

— Droughts,
— Flash floods,
— Soil erosion,
— Extinction of several wild animals and a threat of extinction of hundreds of species,
— Global warming.

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.

Shrinking of forest cover over the world has to be stopped without delay to maintain the habitability of our planet earth.

5. ENERGY

We need energy for cooking in homes, 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, which are still rising,

- the reserves of petroleum may be exhausted within 150 years.
- coal may last a bit longer.

Once finished, petroleum and coal cannot be formed again during a lifetime.

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

Non-Conventional Sources of Energy

Increasing population would need more and more energy. New sources such as solar energy, nuclear energy, tidal energy or wind energy, are being used. **Solar cookers** and **solar batteries** to harness solar energy and biogas produced from organic wastes (cowdung, farm wastes and sewage, etc.) are already in use and have to be further popularised.

6. MINERAL RESOURCES

More population means more requirements, more industries, more means of transportation and all of them utilise minerals such as iron, copper, etc.

Minerals are a non-renewable resource. Once finished, they can never be replaced

12.9 POPULATION GROWTH AND URBANISATION CAUSING SERIOUS PRESSURE ON RESOURCES

12.9.1 Changing Face of the Earth

The human population is growing very fast throughout the world. The villages are turning into towns, towns into cities and cities into megacities or the metropols — a process covered under what we call **urbanisation.** Some of the major changes occurring in the process of urbanisation are as follows :

- More and more residential **buildings, markets, schools, hospitals,** etc.
- More **streets** and **roads**, more **highways, railway lines** and **airports**.
- More **industrial installations, godowns** and **reservoirs**, and so on.

All such developmental activities are encroaching upon the open land, as well as on the neighbouring agricultural land. There is encroachment even on the forests. Thus, overall, there is a loss of natural vegetation which also is degrading the environment specially the climatic conditions.

12.9.2 Rising Living Standards of Growing Population

Living standards of the people are rising very fast.

- More and more household equipment – the furniture, the crockery, electric gadgets, the decoration articles, and so on.
- More clothes : just think of how many shirts and suits, how many sarees, and how many pairs of shoes per person, and so on.
- Some means of personal conveyance – a cycle, a motor cycle, a motor car (some people may have several of each of these for a single family), and then there are taxis, and other means of transport.

12.9.3 Need to Check Exploitative Use of Resources

As you have learnt, the increasing numbers in population, and even more than that, the increasing standards of modern living are causing very rapid depletion of natural resources. Among these, there are some resources which are non-renewable *i.e.* once lost are lost for ever (never regained) and there are others which take very long time to get renewed. Therefore, it is absolutely necessary that every citizen becomes conscious and contributes to the sustainable use of natural resources.

Sustainable means which can be continued with no ill effect on the availability of the required items.

Sustainable development means the kind of development that meets the need of the present without compromising the ability of the future generations to meet their own needs.

Sustainable development can be achieved mainly by :–

- **Reduction of excessive use** of natural resources.
- **Recycling** and **reuse** of resources wherever possible.
- **More use of renewable resources** such as solar energy, wind power, etc.

? PROGRESS CHECK

1. Mention whether the following statements are **True** (T) or **False** (F).
   (i) Urbanisation is the enlargement of towns covering a very large area together with modern facilities. (T/F)
   (ii) Rising population is leading to an increased coverage of land for raising forests. (T/F)
   (iii) Coal and iron are inexhaustible resources. (T/F)

2. Fill up the blanks by choosing the right option.

(i) Public conveyances like buses and railways are ..... (necessities/luxuries).

(ii) Many sets of garments per member in a family are ..... (necessities/fashions).

(iii) Petroleum is a resource of the same category as that of ..... (copper/ground water).

12.10 RATE OF POPULATION GROWTH MUST BE REDUCED

For a better future of mankind, the rate of growth of human population must be reduced. That will mean (i) less burden on depleting resources, (ii) better health care, (iii) better education, and so on. How it can be done is engaging the attention of all governments and social organisations.

Before describing a few major steps being taken in this direction, let us first understand a **few terms** and some of their applications in the study of human population.

A FEW STATISTICAL TERMS

- **Demography** (*demos* : people + *graphos*: measurement). Statistical study of human population. This is specially with reference to size and density, distribution and other vital statistics (which are given below).
- **Population density** is the number of individuals **per square kilometre (km²)** at any given time.

  Towns and larger cities have a greater population density than the rural areas. Countrywise density in 2016,

  Netherlands — about 407 persons/km² the highest population density,

  Japan — about 348 persons/km²,

  India — about 392 persons/km² and

  US — only about 33 persons/km².
- **Birth rate** or **natality** is the number of **live births per 1000 people of population per year**.

  For example, if there were 440 live births in a population of 20,000, the birth rate would be $440 \div 20 = 22$.
- **Death rate** or **Mortality** is the number of **deaths per 1000 of population per year**.

  [Registration of births and deaths is compulsory in our country].
- **Growth rate of population** is the difference between the birth rate and the death rate.

  As long as the birth rate exceeds the death rate, the population grows. If the birth rate is lower than the death rate, the population declines.

In India, the birth : death ratio in 1901 was 46 : 44 and in 1973, it was 37 : 14. It is apparent that both birth and death rates have fallen, but the fall in death rate is much sharper which is on account of better medical care, both for infants and the old. The result is, sharper rise in population. The current rate of growth (2006) of population is about 2.07%, which is very high when we compare it with that of the world (a little less than 2%). In 2016 India's population is about 1·32 billion.

12.11 NEED FOR ADOPTING CONTROL MEASURES

As the population density increases in a country beyond its means, it brings many problems, for example :

— per capita *income comes down*

— *natural resources* like land, minerals, wood, fuel, etc. *decrease*

— general *health goes down*

Overall, the large population of a country is the result of having **large families** and the quality of life goes down. Therefore, there is pressing need for adopting population control measures.

PROGRESS CHECK

1. Give the technical terms for the following :

   (i) Statistical study of human population

   .....

   (ii) Number of deaths per 1000 people per year

   .....

   (iii) Number of individuals per sq. km. at any given time

   .....

   (iv) Difference between birth rate and death rate

   .....

2. List any three consequences of high population density .....

   .....

12.12 POPULATION EDUCATION AND POPULATION CONTROL

It is necessary that the people should be educated about the need to limit the population and about the steps which can be taken in this direction.

1. The message about population problem should reach as many people as possible including those living in very remote areas.
2. People should be made aware of the advantages of having small families and, at the same time, the disadvantages of having many children.

   China is almost reaching the norm of 1 child per family, whereas India has to strive hard even to reach the 2 children per family norm.
3. The orthodox view, to have at least one son specially in Indian society, should be modified by education.
4. Marriageable age should be higher. ***[The age restriction of at least 18 years for girls and 21 years for boys under the law must be followed strictly].***
5. The married couples should be educated to ***delay the birth of their first child, to space the second with a sufficient interval*** for proper upbringing and to ***stop the third***.
6. People should be advised to adopt family planning methods by which they can prevent pregnancy **(contraception)**. These include devices for both men and women, for example: **Condoms** (such as 'Nirodh'), **intrauterine** devices (such as Copper-T), **oral pills** (such as Mala-D). Various methods of contraception are being described in the next section 12·13 below in more detail.

FAMILY WELFARE

The inverted **red triangle** has become a popular sign in India for family welfare. It is prominently displayed at all such offices and hospitals where any help or advice about family planning is available free of cost. These are known as family welfare centres.

The term FAMILY WELFARE has three aspects :

1. **Family planning in terms of having a small family.**
2. **Total welfare of the small family, including the diet and nutrition of the child and of the pregnant mother.**
3. **Subsequent care of the children, e.g., immunisation and oral rehydration therapy, etc. to ensure survival of the young ones.**

? PROGRESS CHECK

1. List any five major disadvantages of having large families .....
   .....
2. What are the age restrictions for marriage for boys and girls respectively in India ?
   .....
3. What are the three aspects covered under family welfare ?
   .....

12.13 METHODS OF CONTRACEPTION

The common methods of contraception are as follows :

1. **Hormonal Methods (Pills) :** Various hormonal preparations come in the form of tablets or pills (commonly called contraceptive pills). These hormones prevent the release of the egg from the ovary.
2. **Barrier Methods :**
   - **(a) Condom (e.g. Nirodh) :** It is used by men only. It is made of latex (rubber sheath). It prevents the sperms from being deposited in the vagina.
   - **(b) Diaphragms :** These are round latex caps with coil spring. These caps can be fitted deep in the vagina on the mouth of the uterus (cervix). These caps prevent the entry of sperms into the uterus.
   - **(c) Sperm-killing (spermicidal) agents:** These are chemicals placed in the vagina near the cervix, which kill the sperms if they are there.

3. **Intra-Uterine Devices (IUDs) :** The two devices commonly used in India are Lippe's Loop and Copper-T. These are fitted inside the uterus. These do not stop fertilisation but prevent implantation of the blastocyst (embryo).

4. **Surgical methods :**

(a) **Tubectomy** (for female) **:** In this, the abdomen is opened and the fallopian tubes (oviducts) are cut or ligated i.e. tied with nylon thread to close the passage of the egg (Fig. 12.5).

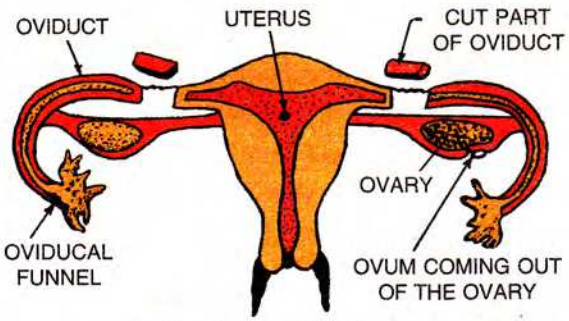


Fig. 12.5 : Tubectomy

(b) **Vasectomy** (in male) (*vasa* = vessel; *tomy*: cutting) **:** In this surgery, a small cut is made in the scrotum, vas deferens (sperm duct) from each testes is ligated and a small piece between the two ligatures is removed (Fig. 12.6). This surgery is easier, quicker and safer. So, it is recommended that between the couple, it is better if the husband gets operated. This operation has no harmful effect on manliness of any kind nor it reduces the pleasure of intercourse or libido.

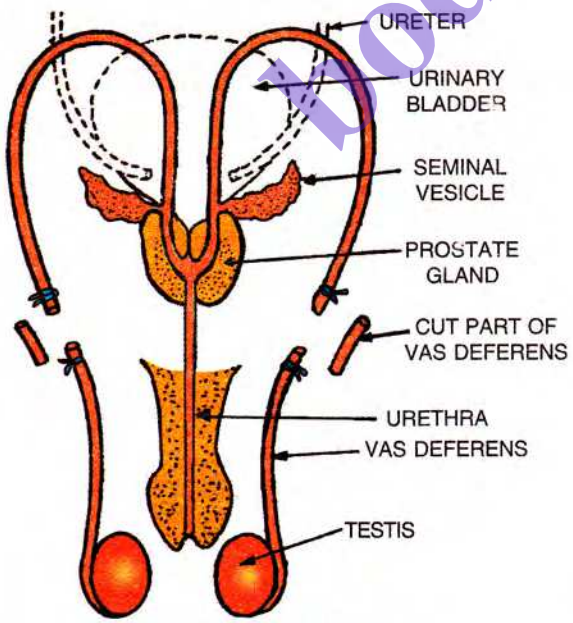


Fig. 12.6 : Vasectomy

5. **Induced Abortion or Medical Termination of Pregnancy (MTP) :** If the woman has somehow become pregnant and the couple does not want to have the child or if there is definite evidence of any serious genetic disease in the embryo based on a special test, then the foetus can be removed. This method should not be considered a contraceptive method, but as a last step that can be taken. This operation (forced abortion) should be performed only by a trained doctor at a hospital. Abortion is legally permitted (only within 5 months of pregnancy) and can be requested by any desirous female at any government hospital at no cost. For this, even husband's consent is not necessary.

PROGRESS CHECK

1. State whether the following statements are True (T) or False (F). If false, write the correct word for the one which is wrong.

Statement	T/F	Correct
(i) Some vitamin preparations prevent the release of the egg from the ovary.	.....	.....
(ii) Use of a condom for contraception is a barrier method.	.....	.....
(iii) IUDs prevent implantation of embryo in vagina.	.....	.....
(iv) Tubectomy is performed on females.	.....	.....

2. Write the full form of MTP. In what circumstances is it recommended ?

MTP .....

Circumstances .....

.....

.....

.....

.....

.....

REVIEW QUESTIONS

A. MULTIPLE CHOICE TYPE

(Select the most appropriate option in each case)

1. What was directly responsible for the rapid rise of world population in the twentieth century?
   (a) Increased food production
   (b) Better transport facilities
   (c) Better education and job prospects
   (d) Use of antibiotics and prophylactic vaccinations
2. Birth rate is the number of live births
   (a) per 1000 people per year
   (b) per 100 people per decade
   (c) per 1000 people per decade
   (d) per 100 people per year

B. VERY SHORT ANSWER TYPE

1. **Give the technical term** for the statistical study of human population of a region.
2. **Name** two surgical techniques (one for the human male and another for the human female) that can be used to prevent pregnancy.

C. SHORT ANSWER TYPE

1. **Write** *true* (T) or *false* (F) for the following :
   (a) Vasectomy is the surgical method of sterilisation in human males. .....
   (b) Tubectomy is the placing of a diaphragm on the cervix. .....
2. **What** is the total world population at present ?
3. **Define** the following terms :
   (a) Birth rate
   (b) Death rate.
   (c) Rate of growth of population.
   (d) Population density.
   (e) Exhaustible resource
4. **Mention** whether the following statements are ***true*** (T) or ***false*** (F). Give reason in support of your answer.
   (a) Cow was the first domesticated animal. (T/F)
   (b) Rapidly growing industries favoured population rise. (T/F)
   (c) Present human population growth is following arithmetic progression. (T/F)
   (d) Birth rate (natality) is the number of live births per hundred people of population per decade. (T/F)
   (e) Tubectomy is a popular surgical method of contraception in human males. (T/F)
5. **What** is the present rate of growth of population of the world and of our own country ?
6. **What** are the age restrictions for marriage by law for boys and girls in India?
7. **Give** two advantages of a small family.
8. **Mention** two reasons for the rapid increase of population in India.
9. Some great author has said that a population explosion is far more dangerous than an atomic explosion. **Justify** his statement ?
10. **Explain** briefly the relationship between poverty and population and how one affects the other.
11. **List** three major landmarks in human history which contributed to the sudden rise in population of the world.
12. **What** was the approximate Indian population according to the 1981 census ? What was it in 1991 ?
13. Sterilisation in men means preventing the flow of sperms into the seminal vesicles by cutting or ligaturing the vas deferens. **Can** there be a corresponding operation made in women ? If yes, **where** ?
14. **What is meant by** family welfare centres ? **What** is the symbol of family welfare in our country ?
15. **List** the advantages of having small families.

D. LONG ANSWER TYPE

1. Our resources cannot keep pace with the rising population. **Give** three examples in support of this statement.
2. **How** can the knowledge of processes of reproduction help people in limiting the size of their families ? Give **two** concrete examples.
3. **What** is the idea behind the phrase "population explosion" ?

E. STRUCTURED/APPLICATION/SKILL TYPE

1. Given below are hypothetical figures in regard to population (in crores) of two countries A and B during the last three decades.

Country	1971	1981	1991
A	6.4	9.6	10.6
B	15.7	15.7	15.3

Fill in the blanks :

(a) Rate of growth of population of country ..... has declined between years ..... and .....
(b) The country ..... shows negative population growth between years ..... and .....
(c) The country ..... shows zero population growth between years ..... and .....