UNIT 7:
CHAPTER-1

HUMAN POPULATION AND THE ENVIRONMENT

General Account

Population is defined as the collective group of individuals of a species living in a particular geographical area and capable of exchanging the genetic information.

Both **abiotic** (physical) and **biotic** (biological) factors regulate the growth and performance of a given population in an ecosystem. **Human population,** like populations of other organisms, is governed by the same natural laws. Since, a population is a changing entity, one is interested not only in its size and composition at any one moment but also in how it changes.

The greatest threat to world's development is the problem of **human population explosion**. Over population of human beings in different geographical regions has put a great stress on limited available natural resources.

AIM OF POPULATION STUDY

Alarming spurt in human population has created several serious problems globally. Therefore, population education has been introduced into the educational system (both at the school and college level) of the country to make the students aware of –

1. Consequences of uncontrolled population growth such as depletion of natural resources, environmental pollution, extinction of species etc.
2. Advantages of small family norms to human beings.
3. The growth, distribution and density of human populations.
4. Relation of population to the standard of life, and
5. Methods of combating growth of human population.

DEMOGRAPHY

The scientific study of vital and social statistics e.g. births, deaths, disease etc. of human population is called **demography**. It deals with three phenomena mainly:

(i) Growth or decline in population in a given region,

(ii) Composition of the population i.e. age groups, sex ratios etc.,

(iii) Distribution of population in space.

CHARACTERISTICS OF POPULATION

A population has certain characteristics e.g. population density, pattern of distribution, age structure, sex ratio, biotic potential etc. which are unique possession of the group and not of its individual members. Further, a population has a gene pool shared by its members.

1. Pattern of distribution - Population is not uniform in a given region say in any country. Individuals in a population may depict random, uniform or clumped distribution. Areas near the water resources are thickly populated whereas population is thin in the desert regions and at high altitudes due to severe climatic conditions.

2. Variation in numbers – Population is a changing entity i.e. the number of individuals of an area varies at different times. This variation is expressed as **population size** and **population density** in the given area at a particular time.

(i) Population size. It means the total number of individuals of a species in a particular area at a specific time. For example, 42000 asiatic lions in the year 2000 or population of India in the year 2001 was 1,027,015,247.

(ii) Population density. It is the number of individuals of a species present per unit area or volume at a given time. for example, number of people per sq. kilometer in the year 2000 or number of phytoplanktons per cubit metre of water.

Population density D = N/S

where, D = Population density

N = Total number of individuals

S = Number of units of space (area or volume)

3. **Age Structure.** The age structure of a population refers to the percentage of individuals of different ages such as young (pre-reproductive), adult (reproductive) and old (post-reproductive).
4. **Sex Ratio.** The sex ratio of the population is the number of females and males per thousand individuals. In 2001, there were 933 females per 1000 males in India.
5. **Biotic potential.** It is the natural ability of the population to increase at its maximum rate under ideal environmental conditions.

FACTORS AFFECTING POPULATION

Many factors affect the population size and density at different times. These factors are-

1. **Natality or birth rate.** It refers to the average number of young ones produced per unit time. In case of human beings, it is generally expressed as number of births per 1000 individuals in the population per year.
2. **Mortality or death rate.** It refers to the average number of individuals that die per unit time. In case of human beings, it is generally expressed as the number of deaths per 1000 persons in a population per year.
3. **Immigration**. It refers to the entry of additional individuals into the existing population of a region from outside. For example, several persons from Bihar state have settled into Punjab state.
4. **Emigration**. It refers to the departure of some individuals from the existing population of a region to a different region or country. For example, many Indians have gone to USA to settle there.

It is important to mention that population size depends upon the balance between above mentioned factors –

Change in population size = (Birth + Immigration) – (Death + Emigration).

5. Environmental factors. Following factors such as –

(i) Food and Shelter

(ii) Natural calamities such as drought, rain, cloud burst, floods, fires, earthquakes, storms, volcanic eruptions, lightening, accidents etc., and

(iii) Biotic factors such as pathogens, poisonous animals, predation etc.

also affect populations by affecting natality, mortality, immigration and emigration.

POPULATION GROWTH

In simple words, **population growth** refers to the increase in its size due to increase in number of organisms. It is determined by the number of individuals added to the population and the number of individuals lost from the population.

Births and **immigration** are two factors that result in addition of individuals to the population. On the other hand, **deaths** and **emigration** are the factors that account for loss of individuals from the population.

If more individuals are added to the population than are lost, the population shows **positive growth.** On the contrary, if reverse occurs i.e. more individuals are lost from the population than are added, the population shows **negative growth**. There may also occur a situation when addition and loss of individuals are balanced. Then the population becomes stationary or shows **zero growth**.

Growth of population is regulated by an interaction between following two components –

(i) Biotic potential

(ii) **Environmental resistance**

The former is the ability of the population to increase at its maximum rate under ideal conditions while the latter includes

number of factors (.e.g. predators, parasites, diseases, scarcity of food, competition, adverse climatic conditions etc.) which always prevent populations from growing as fast as their biotic potentials would permit.

POPULATION GROWTH CURVES

The growth of a population is represented by a **population growth curve.** It is the mathematical expression of the growth of a population from its beginning till it stabilizes. Population growth curve can be represented by a graph made by plotting the number of individuals of a species against the time factor.

Types of growth curves

Two contrasting types of growth curves that the various populations of species depict are **S-shaped** and **J-shaped.**

1. **S-shaped or Sigmoid Growth Curve.** This type of growth curve is shown by the populations of most animals as well as by the yeast cells grown under laboratory conditions. It can be obtained by plotting number of individuals against time (Fig. 7.1). It has four phases:

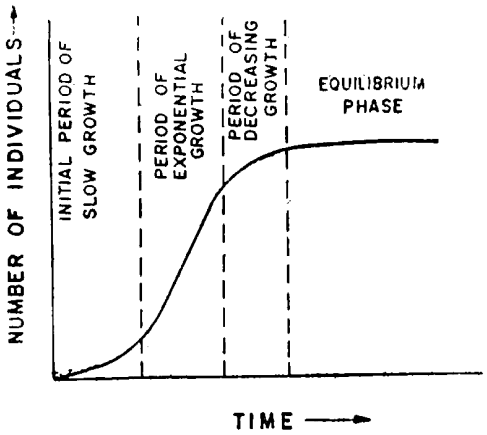

Fig. 7.1 Typical S-shaped or sigmoid growth curve

(i) **Initial period of slow growth (Lag phase)**. In this phase, there is little increase in population.

(ii) **Period of exponential growth (Exponential phase).** In this phase, there is rapid increase in population due to availability of food and other requirements in plenty and little competition.

(iii) **Period of decreasing growth (Negative acceleration phase).** As environmental resistance increases, the growth rate of population slows down.

(iv) **Phase of equilibrium (Stationary phase).** Finally, a stage comes when number of individuals added to the population balance those that are lost from the population. Here, the population becomes stable. Every population tends to stabilize with the resources of its environment. This limit in population is imposed by the **carrying capacity** of the environment. **Carrying capacity means the number of individuals in a given area that can be supported indefinitely on available resources.**

2. J-shaped Growth Curve. This type of growth curve is depicted by annuals or by those animals which feed on seasonal plants (Fig. 7.2). this curve shows only two phases –

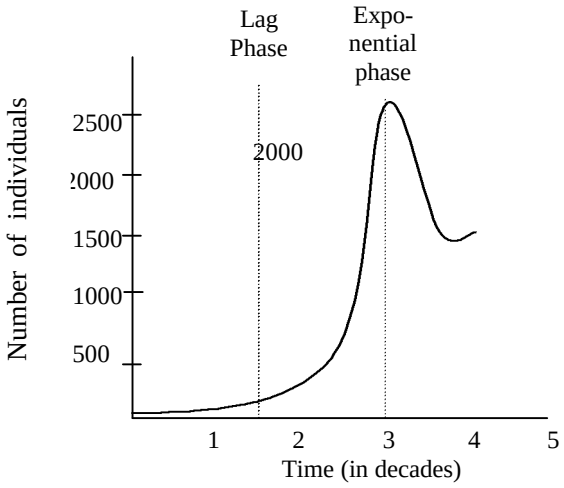

Fig. 7.2. J-shaped growth curve of reindeer.

(i) **Lag phase** – In this phase, there is little increase in the population.

(ii) **Exponential phase** - During this phase, the population increases very fast till all the resources are exhausted. This leads to maximum starvation and mortality.

HUMAN POPULATION GROWTH CURVE

Human population also shows S-shaped growth curve.

History of man goes back to over a million years of existence over this planet, the **earth.** Though, it is difficult to give exact figures of early human beings yet it is believed that human population was around 5 million by 8000 B.C. For a very long time, the human population remained in the lag phase, having very slow growth (Fig. 7.3).

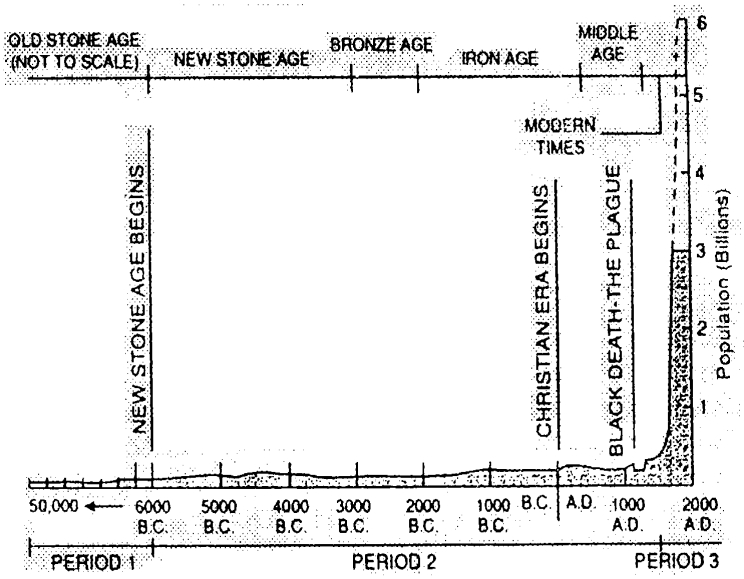

Fig. 7.3 Growth of human population through history.

By the year 1 A.D., there were about 0.25 billion people in the world and by the year 1600 about 0.5 billion people. In other words, population doubled in 1600 years. The **exponential phase** of growth of human population started around 1750 and since then

the time taken by the population to become double has shortened considerably. The human population became 1 billion between 1600-1800 A.D. i.e. it doubled in 200 years; then it doubled in 130 years (1800-1930 A.D.) growing to around 2 billion.

Table 7.1. Expected World Human Population

Year	Population (billion)
1 A.D.	0.25
1600 A.D.	0.50
1800 A.D.	1.00
1930 A.D.	2.00
1965 A.D.	3.50
1975 A.D.	4.00
1990 A.D.	5.00
2000 A.D.	7.00
2025 A.D.	8.40
2100 A.D.	11.20

From 1930-1975 A.D., human population reached around 4 billion (i.e. it doubled in 45 years). At present, world human population is growing at a rate of 2% a year and it becomes double every 35 years. In the year 1965, it was around 3.5 billion and with the existing growth rate it was estimated to reach 7 billion by 2000, 8.4 billion by the year 2025 and 11.2 billion by the year 2100.

Presently, human population is increasing at the rate of 2 persons every second or 200,000 people every day or 8 million people every month or 70 million every year. This high rate of human growth is termed as **population explosion**. The population may stabilize in future to depict S - shaped growth curve.

REASONS FOR GROWTH OF HUMAN POPULATION

Two primary factors for the increase in human population are –

1. **Decrease in death rate**, and
2. **Increase in longevity.**

The human population explosion is largely a result of decrease in death rate. The data reveal that death rate decreased from 42.6 in 1901-1911 to 12.5 in 1971-1981. There are number of factors that have contributed to the decline in death rate and the consequent increase in human population. These factors are:

1. **Control of diseases.** Control of communicable diseases such as plague, cholera etc. as well as decline in the incidence of dreaded diseases like tuberculosis, malaria have reduced the death rate and increased the average human age.
2. **Advancement in agriculture**. Improved agricultural techniques as well as development of high yielding, disease resistant varieties have increased food production for the rising human population. Advancement in the techniques of animal breeding have also increased food production of animal origin (milk, eggs and meat). These means have resulted in generation of surplus food for emergency situations thereby decreasing death rate.
3. **Storage facilities**. Better storage facilities have helped in making food available to human population all the year round. Save grain campaigns launched by various governments in different countries have minimized the loss of food by pests in storage.
4. **Better transport**. Advancements in the modern transport system has helped to carry food from the surplus regions to the scarcity regions. This eliminated famines.
5. **Spread of education.** Government's efforts to provide education to all (young, adult and old) by implementing various schemes and opening schools and colleges even in villages have helped in removal of mis-beliefs.
6. **Government efforts**. Number of steps taken up by the government such as introduction of public distribution system, checking of hoarding and smuggling of grains, maintenance of reserve stocks etc. have ensured food supply to all.
7. **Protection from natural risks.** Advancement in science has led people to live better and protected life. Living in houses in villages and cities with better **hygienic** conditions has protected people from adverse changes in climatic conditions,

diseases as well as from wild animals. This has decreased death rate.

8. Improvements in medical facilities have also helped in reducing death rate.

POPULATION TRENDS IN THE WORLD

The growth of human population in different countries is variable. On this basis, countries are divided into two groups:

(a) Developed countries

(b) Developing or undeveloped countries.

Developed Countries include U.S.A., Canada, European countries, Australia, New Zealand, Japan and Russia. these nations have a low rate of population growth, high per capita income and better living standards.

Developing countries include nations of continents of Asia, Africa and Latin America. These nations have relatively high rate of population growth low per capita income and poor life standards. About 2/ 3rd of the world population is present in developing or underdeveloped countries.

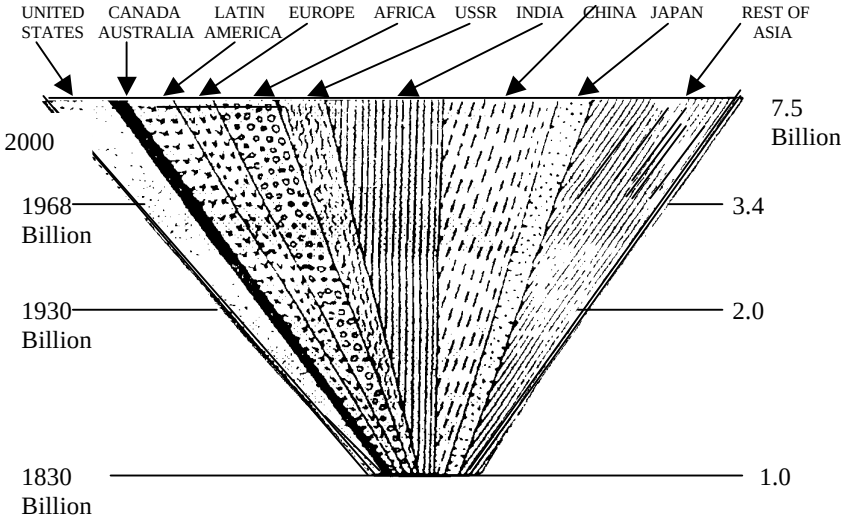

Fig. 7.4 Estimated population of different nations by the year 2000.

POPULATION TRENDS IN INDIA

In the matter of population, world leader China has a population of 1160 million people. India is second most populous country in the world, next to China. According to 2001 census, India has a population of 1027 million. As per statistics, India has only 2.42% of the world's land area but supports over 15.5% of the world's population.

Following table depicts important data of population trend in India particularly population, sex ratio and density per sq. km:

Table 7.2. Data of population, sex ratio and density per sq. km. of India.

Census year	Population (Millions)	Sex-ratio (Females/1000 males)	Density per Sq.km.
1901	238	972	77
1911	252	964	82
1921	251	955	81
1931	279	950	90
1941	319	945	103
1951	361	946	117
1961	439	941	142
1971	548	930	173
1981	684	935	216
1991	844	929	267
2001	1027	933	312

As is seen in Table 7.2, India's population has been steadily rising since 1901. However, from the period of **big divide** (year 1921), India's population started to increase sharply. Since independence, its population has increased 3 times. It crossed one billion mark on May 11, 2000.

CONSEQUENCES OF OVERPOPULATION

Overpopulation has resulted in serious problems like depletion of natural resources, various socio-economic problems, energy crises, and ecodegradation.

A. Socio-economic problems. Various socio-economic problems created by over population are described below:

1. **Food.** Overpopulation has resulted in large families. These large families with limited means are unable to provide balanced diet to their children. As a result, the latter suffer from malnutrition and grow into less fit members of the society.
2. **Space.** It is limited. To accommodate growing population more cities are coming up. This has created pressure on agricultural land and forests. Clearing up of forests for agriculture and habitation has further caused problems like soil erosion and floods.
3. **Employment, education and medical aid.** Over population has resulted in large scale unemployment, lowering of education standards, unability to afford higher education to all the children as well as unavailability of modern medical facilities to all.
4. **Essential goods and poverty.** Over population leads to shortage of essential goods thereby resulting in hike in their prices. Large families with single earning hand often remain poor as with limited income, single earning hand can not maintain standard of living, education of children, medical facilities for members of the family etc.

B. Energy Crisis

Another consequence of overpopulation is that it has created greater demand for energy such as fuel wood, fossil fuel and electricity.

C. Ecodegradation

Overpopulation causes ecodegradation e.g. **pollution of air**, water and land; **increase in urban slums** as well as **deforestation** leading to soil erosion droughts and floods.

POPULATION CONTROL

Presently, human population is doubling every 35 years. If this continues, soon earth will be over crowded with human beings. Man has started realising his fate and has initiated plans to check this rate of increase by adopting following measures:

Planned Control of Population. Reduction in birth rate is the only practicable and direct method to control world's population. It can be done in the following three ways:

(a) Education. Educational institutions and **mass media** (e.g. television, radio, newspapers, magazines etc.) are the means by which people can be educated about the consequences of overpopulation and advantages of small family. The awareness in the people will certainly help to check population growth.

(b) Increasing marriageable age. At present, marriageable age is 18 years for females and 21 years for males. If the marriageable age is reasonably increased, it can definitely help to check population growth.

(c) Family planning. Government of India, in an attempt to check high birth rate, started voluntary approach towards birth control measures. This programme initially failed in view of people's traditional resistance to birth control measures. In 1976, Indian government started tentative programme of compulsory sterilization which required one parent to undergo sterilization after a couple had produced two children. This programme was later again replaced by voluntary approach alongwith steps to educate people regarding benefits of family planning measures.

BIRTH CONTROL

It refers to regulation of baby's birth by preventive methods or devices to limit the number of offsprings.

Various **birth control methods** have been described to deliberately prevent fertilization. These methods are of two types:- temporary methods and permanent method.

1. Temporary methods. These methods include safe period, coitus interruptus, chemical means (spermicides), mechanical means (condom, diaphragm and cervical cap, intrauterine devices), physiological devices, abortion, abstinence and other contraceptives.

(i) Safe period. A week before and a week after menstrual phase is generally considered as the safe period for sexual intercourse. This method reduces chances of pregnancy but is not a full proof

method. This idea of safe period for sexual intercourse is based on the facts that -

(a) Ovulation normally occurs on the 14^{th} day (variation 13-16 day) of menstruation, and

(b) Ovum remains alive for about 2 days and sperms for about 3 days.

(ii) Coitus interruptus. This method involves withdrawal of the penis by the male before ejaculation. This way, seminal fluid is not introduced in the vagina of the female and fertilization is prevented. Though, this method is the oldest method in use yet it has certain drawbacks. During sexual intercourse, male releases lubricating fluid from Cowper's glands before ejaculation. This fluid contains many sperms which may fertilize the ovum.

(iii) **Chemical means (spermicides**). An agent that kills the sperms is called **spermicide**. Certain chemicals such as citric acid, lactic acid, boric acid, zinc sulphate, potassium permanganate etc. act as spermicides. If introduced into the vagina before sexual intercourse (in the form of foams, jellies, pastes, creams, tablets), these chemicals adhere to the mucous membrane and immobilize and kill sperms. This method is commonly used by educated females.

(iv) **Mechanical means**. These methods of contraception include use of condom, diaphragm and cervical cap, and intrauterine devices.

(a) **Condoms.** These are made of rubber sheath to cover the erect penis before sexual intercourse by males. Use of condom checks pregnancy by preventing introduction of seminal fluid in the vagina of female. Use of condom by males is the most widely used contraceptive in India. On the basis of quality of rubber used, it is available in the market under different trade names.

Government of India has introduced a scheme to provide condoms free of cost to people in an attempt to check birth rate under the trade name 'Nirodh'.

This method is very effective and has no side effects. However, certain precautions must be taken like discarding the condom after a single use.

This temporary method of birth control is also a safeguard against AIDS and other sexual diseases.

(b) **Diaphragm and Cervical cap:** These devices are used by females before sexual intercourse. Diaphragm and cervical cap are the counterparts of condoms in the female. These are rubber devices which are fitted on the cervix in the vagina by the female to prevent the entry of sperms into the uterus. These devices are smeared with spermicidal jelly or cream or foam or paste each time they are used by females. These devices must be kept fitted on the cervix in the vagina at least six hours after sexual intercourse.

(c) Intrauterine devices (IUDs). These devices are used by women. IUDs are plastic or metal objects such as **loop, copper-T, spiral ring, bow, shield** etc. that are placed in the uterus of the female by the doctor.

When implanted, IUDs prevent the fertilization of ovum or implantation of the embryo. These devices have following drawbacks:

- Their presence acts as a minor irritant thus forcing the egg to move down the Fallopian tubes and uterus rather quickly before fertilization or implantation.
- Their spontaneous expulsion without the woman's knowledge may result in pregnancy.
- Occasional hemorrhage in woman.
- Chances of infection in the uterus or vagina.

(v) **Physiological (Oral) devices.** These include birth control pills also commonly called **oral contraceptives**. These pills, when taken under medical advice, inhibit the secretion of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) which are necessary for the process of ovulation. Thus, oral contraceptives check ovulation. Now a days, a **combined pill** is used commonly as birth control pill that contains synthetic progesterone and estrogen hormones in doses high enough to check ovulation. Pill under the trade name **'Mala D'** is taken daily by women and pill **'Saheli'** is taken weekly.

Oral contraceptives have **side effects** such as nausea, breast tenderness, weight gain, slight blood loss between menstrual periods and high blood pressure.

(vi) **Abortion.** It refers to medical termination of pregnancy before the foetus becomes viable. This method is among the most widely used methods of fertility control in the world. Certain pills are available in the market which act as abortants by checking the implantation of zygote or detaching the implanted egg and inducing menstruation.

(vii) **Astinence.** This is the best and 100% sure method of birth control. It involves abstaining from sexual intercourse. Though, it looks impracticable yet some couples practice this method at certain times with 100% success.

(viii) **Other contraceptives.** Now a days, certain contraceptives can be implanted under the skin of the upper arm to prevent pregnancy for 3 to 4 years. Injectable one-month contraceptives are also manufactured in countries like Germany, China, Mexico and marketed globally.

2. Permanent method. Sterilization is the permanent and sure method of birth control. It is called **tubectomy in female** and **vasectomy in male**. This method involves surgery. A short segment of oviduct in female or vas deferens in male is removed and the remaining ends of these reproductive ducts are tied tightly with surgical thread. Such surgical operations are minor, usually performed under local anesthesia by doctors. This method does not affect sexual life. Earlier, males had the belief that after vasectomy they will not be able to ejaculate and hence did not adopt this method. However, proper education has changed their traditional thinking as after vasectomy, the ejaculation consists of only secretions of various glands and has no sperms. The sperms are still produced by sterilized male but they are reabsorbed in the body.

Now a days, a telesopic instrument – **Laproscope is used in tubal ligation** to block the Fallopian tubes in females. Such females, after operation, continue to produce eggs but the latter fail to pass into uterus and hence fertilization is prevented.

All birth control measures should be used with the advice of qualified doctors.

ENVIRONMENT AND HUMAN HEALTH

In simple words, the surroundings of an individual is termed as its environment. The environment includes both abiotic (physical and edaphic) and biotic (living) factors with which the individual regularly interacts. Any significant change in these factors has an effect on the individual.

Man's activities have resulted in the alteration of the physical, chemical and biological environment significantly. Consequently air, water and soil have become polluted. Even low level exposure over a period of time to a complex cocktail of pollutants in air, water, soil, food and consumer products is likely to contribute significantly to the health status of human beings all over the world. Furthermore, new technologies, changing life styles, work and life patterns etc. present new and sometimes unexpected impacts on the environment and its influence on health of people.

In 1948, World Health Organization (W.H.O) gave the definition of human health. Accordingly, **"health is a state of complete physical, mental and social well-being, and not merely an absence of disease, or infirmity".** This definition recognizes three dimensions of health – **physical, mental** and **social**. Fourth dimension i.e. **spiritual health** has also been suggested.

Physical health implies normal appearance, size, structure and function(s) of all the parts of the individual's body.

A **mentally healthy** person is one who has following characteristics:

- He can think for himself and can take his own decisions.
- He neither underestimates nor overestimates his ability.
- He is able to live in harmony with others. He understands emotional needs of others, accepts criticism and is helpful, courteous and considerate in his dealings with others.
- He can face stresses and strains and also has the ability to solve the problems rather than avoiding them by consuming drugs or alcohol. In other words, he has a self-control.
- He has moral and spiritual values too.

Both physical and mental health are interrelated. Any change in one affects the other.

Social health may be defined as the sum total of all the programmes aimed at protecting, maintaining and improving the health of the people.

DISEASE

Any physical or functional change from the normal state that causes discomfort, or disability, or impairs the health of a living organism is termed as disease (des = away; aise = ease). Disease is caused by disease agent(s).

Disease agents. Any substance or force which causes a disease by its excess or deficiency or absence is termed as disease agent.

Types of disease agents. Disease agents are categorized into six main types –

1. **Physical agents.** These include cold, heat, humidity, pressure, radiations, sound, electricity etc.
2. **Chemical agents.** These are further of two types –
   (a) Exogenous chemical agents. These agents enter the body from outside by inhalation, ingestion or inoculation e.g. gases, dust, particles, fumes, metals and allergens (spores and pollens).
   (b) **Endogenous chemical agents**. These are formed inside the body itself e.g. enzymes, hormones, nitrogenous wastes like urea, uric acid etc.
3. **Biological agents.** These are also called **pathogens** (Gr. pathos = disease; genes = producing). These include viruses, rickettsias, bacteria, fungi, protozoans, helminths and arthropods.
4. **Nutrient agents.** Carbohydrates, proteins, fats, minerals, vitamins, water are the nutrient agents.
5. **Mechanical agents.** These comprise friction or other mechanical forces which result in injury, sprain, dislocation, fracture.

6. **Genetic disorders.** These result in underdevelopment or total absence of certain organs in the body.

The above mentioned disease agents result in **congenital and acquired diseases.** The latter may further be of two types – **communicable diseases and non-communicable diseases.** Various diseases resulting from environmental pollution have been mentioned in Unit-V.

Mental illness. It is the arrested or incomplete development of mind. Mental illness is of three main types – **psychosis, neurosis** and **personality and character disorders.**

MAJOR COMMUNITY HEALTH SERVICES

Community health services are rendered through –

I. Health centres

II. National programmes

III. Universal immunisation programmes

IV. Blood banks

Health Centres. Basic activities of health centres include –

1. Environment sanitation
2. Prevention and control of communicable diseases
3. Maternity and child health and family planning
4. Health education
5. Medical care centres
6. Mental health
7. Collection and cross-checking of vital statistics

National Programmes. These include-

1. National Malaria Eradication Programme (NMEP)
2. National Filaria Control Programme (NFCP)
3. National Leprosy Control Programme (NLCP)
4. National Cholera Control Programme (NCCP)

Universal Immunisation Programme.

1. In may, 1974, WHO launched a global immunization programme for children for protection against six dreaded diseases – **diphtheria, pertussis** (whooping cough), **tetanus, polio, tuberculosis** and **measles**.
2. By 2005, it is aimed to make the whole world **polio free**.
3. Recently, campaign against **hepatitis B** has been launched globally.

UNIT 7
CHAPTER-II

HUMAN RIGHTS

Human rights give the idea of rights relating to life, equality, liberty and dignity of individual generated by the constitution.

In 1947 the Indians had hopes and aspirations of better living, true human dignity and had dreamt of economic self-reliance. The people had higher expectations and thought of stable country with viable income. People looked for an equal society. The Indian constitution enables the people to achieve aspired development in the nation. The industrial self-reliance was the solution to every problem of the country. Academicians, leaders, businessmen and people were taken away by this euphoria. India was set for scientific and technical growth.

The country has grown industrially, and shifted from traditional to modern energy carriers, for example, coal and fuel wood are replaced by electricity, liquid and gaseous fuels. The production of coal, metallic and non-metallic resources has increased up to many times. Large dams have been constructed for the production of electricity. Dams have displaced many people denying them the right to housing.

The aim of development has been material satisfaction and can be measured by the amount of consumption of material goods. The effect of development leads to depletion of natural resources like natural habitation etc. and violation of human rights.

Rapid increase in population in the urban area has borne the testimony of modernization – cities have invaded villages with their evils. The trans-boundary effect of city life. i.e. satisfaction has got prominence in India. Continuous rise of consumerism increases production and manufacture of industrial products. This unhealthy competition engaged the people for a machine-centered satisfaction. A new community became dominant and powerful with Euro-american in culture and Indian in blood. This community is in minority and dictated the development policies for the developing country. This leads the community to dependent largely on a techno-scientific growth like in India.

A growth spree has been also seen in agriculture. In 1960-61 the total crop area was 152.8 million heaters and in 1980-81 it increased upto 172.8 million hectares and it may be due to drastic increase in the rate of population growth. Through excessive use of chemical fertilizers and genetic engineering food production has increased four times to meet the demand of population. The effect of chemical fertilizers on agriculture leads to disastrous results and it has caused decrease in fertility of soil. Pollution caused by mining, urbanization and industrial wastes caused loss of fertile soil and resulted in unbalanced ecology like dry up soils, lakes, rivers and sources of underground water.

The people who have lost their agricultural land and forests due to the extension of mines have become labourers. The adivasi communities in Madhya Pradesh face a disastrous environment due to mining in Bastar.

The developmental policies have not been not benefitting most of the people. Only a small group of business classes, elites and upper middle class are benefitted by the policies of government. The modern India and its policies are against human rights. In India most of the people have denied the fundamental rights to equality and to life under articles 14 and 21 of the constitution, respectively.

The development of India leads to adverse psychological effects to those who have suffered maximum by techno-scientific growth. Majority of the urban people have complex physical and psychological stress induced by growth and environmental crisis. Let us take a example of environmental problems. A district in Tamil Nadu has become subject to multipronged attack due to industrialization. This small part of the city has Thermal Power Station, chemical industries, oil refineries, copper melting plants. The effluents discharged by industries have affected the rights to livelihood of the fishing community. Large number of people are now daily wage labourers and have poor economic status and it has not allowed them to prosper taking advantage of growth and development.

Human rights can serve as instruments in changing society, if it integrates itself with the people's way of transforming individual rights into community rights. This strengthens the

development process and translate the sustainable development into practice and safeguard the human rights in its true spirit.

VALUE EDUCATION

Concept of Value

Concept of value education is very extensive as it includes morals, religions etc. It consists of all the component parts like individual, society, nation and universe etc. Meaning of value is related to economic value, Philosophers like Rudullah Lotse in nineteenth century attached more extensive meaning to value. It is in this broad sense, we use the term value as literary value, democratic value, life value and education value in our day to day speaking and writing.

Components of value education

1. Moral Education
2. Environmental Education
3. Population Education
4. Human rights and Duties
5. Health Education
6. Indian Culture
7. Physical Education
8. Yoga Education
9. History of Indian freedom movement

Education plays a vital role in increasing the capacity of the community for good quality of life. Education also help in sensitizing one's awareness and for motivating one's behaviour to suit rising needs and demands for survival, growth and development. It's aim is to achieve the goals of progress and prosperity. It can only erode ignorance. Education plays a vital role in increasing the capacity of the family and community for a better quality of life.

The present education is the process which makes a person to develop himself into a woman or man. The final result of

education is a development of cultured person. The present education system does not guarantee a value based life.

The growing concern over the erosion of essential values and an increasing cynicism in society has brought to focus the need for readjustments in the curriculum in order to make education a forceful tool for the cultivation of social and moral values.

Value education helps to eliminate obscurantism, religious fanaticism, violence, superstition and fatalism. Value education should lay primary emphasis on "Everyone has the right to education". To achieve this goal following principles are laid down-

1. Education shall be free at elementary stages and should be made compulsory.
2. Technical & professional education shall be made generally available.
3. Higher education shall be equally accessible to all.
4. Education shall undertake activities for the maintenance of peace.
5. Parents have a right to choose the kind of education that shall be given to their children.
6. Education shall be directed to the full development of human personality.

Value education should be emphasized on the following points:-

1. To develop the ability to distinguish between the right and wrong.
2. To live in harmony with nature and world
3. To develop an attitude of genuine appreciation for the value and respect for all forms of life
4. To be aware of social problems
5. To be ready to accept leadership
6. To make an individual to be responsible citizen, their role and sense of responsibility towards society, family and their surroundings

7. To contribute intellectual, moral, physical and personality development

Value education constitutes a centrifugal force with full control over the objections, content, methodology and management of education. The benefits of education should reach beyond the classroom to the adult population.

Need of Value Education

If we analyze the Indian social position, it has been found that traditions of ***Indian Culture*** are degrading day by day. The reason for degradation might be increasing indiscipline and destructive mentality. Among the special features of education, moral and basic education occupies important place. Indian education system was lacking social, spiritual and moral values in the curriculum of secondary education level.

The ancient education system in India was full of religious impressions. The expert persons were very conscious about religious education and they suggested moral education in place of religious education. India is a country of varieties. So Indian education commission suggested the curriculum based on social, spiritual and ethical values. Almost all the commissions and committees recommended value education. National Education Policy (1986) however stamped on value education.

Value education teaches us to preserve good things and to develop moral, social, aesthetic and spiritual sides of a person which are undermined in formal education. It also develop sense of humanism, a deep concern for the well-being of others and the nation. It helps us to accept and respect the attitude of those who differ form us. It does not mean value imposition or indoctrination. Value education has the capacity to transform a diseased mind into healthy mind. This leads to fulfillment of the evolutionary role in man.

HIV / AIDS

AIDS is not a single disease but a syndrome – a set of diseases which result AIDS from the destruction of the body's defenses by the HIV (Human Immuno-deficiency Virus).

AIDS comes from a virus HIV, but where this virus came from is not known. AIDS was first recognised in the United States in 1981 However, it is clear that AIDS cases had occurred in many

parts of the world before 1981. The evidence now suggests that AIDS epidemics began at roughly at the same time in several parts of the world, including United States and Africa.

Acquired Immuno-deficiency Syndrome

AIDS is a fatal and dangerous disease which is caused by a virus called human immuno-deficiency virus (HIV). This HIV virus destroys the white blood cells present in our blood which protect us from infections. People infected with HIV are easily affected by diseases like tuberculosis, diarrhea and pneumonia etc. Repeated infection leads to death of a person. After entry of virus, it multiplies and takes 8-10 years to completely destroy the body immune system. During this period the HIV virus spreads to other persons.

HIV belongs to a family of viruses known as retroviruses. HIV is classified under a subgroup of retroviruses called lentiviruses.

Spread of HIV/AIDS

Spread of HIV takes place by the following ways -

1) Unprotected sexual intercourse with an infected person
2) Using needles/syringes contaminated with the virus from an infected person
3) Blood transfusion from an infected person
4) From an infected mother to the foetus through the placenta

HIV/AIDS is not spread by

1) Hugging and touching
2) Sharing food and utensils
3) Shaking or holding hands
4) Mosquito bites
5) Looking after an infected person
6) Working or playing together
7) Sharing toilets
8) Coughing or sneezing

9) People in a crowd

SYMPTOMS OF HIV/AIDS

1) Itchy skin rashes
2) Cold sores all over the body
3) Swollen lymph glands.
4) Loss of weight (more than 10%)
5) Persistent fever
6) Persistent diarrhoea
7) Severe night sweats
8) Persistent cough

PREVENTION/PROTECTION FROM AIDS

1) Practising safe sex
2) Avoiding injections with contaminated needles
3) Testing blood for HIV (by blood banks)
4) Avoiding/terminating pregnancy if a woman is suffering from the disease

AIDS is controlled by

A→ Abstinence

B→ Be faithful

C→ Consistently use condoms

D→ Don't use unsterilized needles

WOMEN AND CHILD WELFARE

India is on path towards knowledge based society, giving due importance to women's awareness, education etc. Knowledge in Women's is a great force in our country. Traditionally, women's are respected in Indian society, so, women economic empowerment will lead to their political empowerment. Women have a crucial role to play in projecting our culture and our way to life. She plays a powerful and positive role in confidence building and creating awareness in their children and family.

The key to a rapid growth of any country lies in real economic growth and investment in its children. Care for children must be the first concern of any country for better development. Environment, education and health are the first all scale welfare programmes for children and women in a country. In India Reproductive and Child Health (RCH) approach was launched in October, 1997. RCH covers all aspects of Universal Immunization Program. (UIP) and Child Survival and Safe Motherhood (CSSM) Program.

India is heading towards commercialisation, industralisation and environmentally unsustainable situations. The livelihood of rural communities is badly hurt by environmental disasters which are as follows:-

1. **Water Pollution**: Water pollution occurs as a result of sewage, garbage disposal, industrial waste, pesticides and sedimentation through soil erosion and timber logging.
2. **Toxic Wastes**: Toxic wastes are dumped in rural areas and impose severe penalties on women.
3. **Deforestation**: Deforestation occurs through timber logging resulting in the loss of topsoil land slides and floods.

It is well documented that massive deforestation has serious consequences on rainfall and climate patterns, resulting in the loss of crops. These food shortages and prices increases affect the livelihood of families and increase women burden as a resource manager who have to seek out increasingly scarce alternatives. The increasing degradation of the natural resource base in many countries has thereby undermined women's role as major resource users and managers in providing food and securing overall family welfare.

Forests are the source of food, fuel and medicines. They are also the home of indigenous communities. Deforestation has caused the loss of these essentials for many indigenous, as well as rural communities. Women as a resource managers now need cash and can be earned only through employment. But in a situation of gender asymmetry, even among the poor, women are the poorest of the poor with little access to scarce resources, including employment opportunities. Pushed into "Formal employment", rural women usually enter the labour market as unskilled, low-

wage workers. Even so, they still carry their traditional burden of child bearing, rearing and overseeing family welfare. Thus children often constitute women only economic wealth and social security. In the absence of viable alternatives, poor women are motivated to maximize their "wealth" by having many children.

Women of child bearing age are more vulnerable to environmental pollutants than men because of their reproductive function and breast feeding practice. With the increase in number of chemicals like lead, the impact on women and children appears to be increasing. According to United Nations studies, the possible effect of exposure to chemicals results in infertility, miscarriage, malformation and neonatal death to growth retardation. Maternal and infant mortality rates are thus a significant indication of health conditions, affected not only by poverty but also by environmental pollution.

ROLE OF INFORMATION TECHNOLOGY IN ENVIRONMENT AND HUMAN HEALTH

Now computer is the strongest tool of information technology. Information Technology made a great impact on every activity of mankind and plays a dominating role in the functioning of life. It is not only restricted to scientific and engineering applications but now in 80% of the work information technology is being applied. In the present scenario thinking of progress without the use of information technology is just like dreaming for winning the race without the help of an expert in games. It provides friendly working, accuracy, time saving and huge money etc.

ROLE OF INFORMATION TECHNOLOGY IN ENVIRONMENT

Information technology play a crucial role in the new operating environment. Environmental problems are now considered global issues with trade implications. Public and consumer environmental awareness is on the rise. Information technology has made environmental information available at our finger tips. Reversed logistic and green issues are increasingly being recognised in the world trade. Manufactures are being asked to take back their used packaging and products for reuse and recycling.

Environmental professions in the third millennium will have to use the best tools available with the new age of information technology. Environmental problems are complex and ever-changing. They require careful and system solving strategies to ensure that solving one problem will not create other problems.

Applications of Information Technology in environment:

1. ***Cartography and Computer assisted drafting***: Computers offers the advantages to cartographers by providing softwares for cartiographic production.
2. ***Photogrammetry and Remote Sensing***: Information technology has made both photogrammetry and remote sensing readily available and far easier to use.
3. ***Spatial Statistics***: Statistical analysis and modelling of spatial patterns and processes are based on computer technology. Advances in information technology have made these techniques more widely accessible and provide more accurate informations of real world processors.
4. ***Geographic information system GIS***: Geographic information system is one of many information technology that have transformed the ways of geographers in research and contribute to society. It is an excellent tool for computerised storage and analysis of spatial data.

INFORMATION TECHNOLOGY IN HUMAN HEALTH:

With the adventure of information technology, many hospitals have a facility to provide complete medical history in the hands of a patients. This Automated system of computer has reduced the time involved in obtaining a patient's history. The patient's medical history can be printed on the medical slip and sent to the physician for review.

The information technology helps the doctors in the following way:-

1. To design and test pharmaceuticals
2. To test and diagnose diseases and illness faster and in a more accurate way.
3. Build and use devices to monitor vital signs and other bodily functions.

4. To design prostheses and reconstruction models.

Following are the techniques used in the information technology for detecting the various diseases:

1. Magnetic Resonance Imaging (MRI)

This technique is used for getting information about the nerve tissues in a human body. The source of imaging in MRI system is a series of strong magnetic pulses applied to a body encased in a magnetically shielded chamber. Computer processing gives an image which show relationships of bone structure and nerve soft tissues. MRI examinations do not exposure patients to radiations.

2. **Multiphasic Health Testing (MPHT)**

MPHT is a series of tests with the computer aided equipment and stores the results and reports them to doctors. This report is delivered to a doctor before patient's visit. MPHT helps the doctors to spend more time on treatment and can be valuable in preventive healthcare.

3. Computerised Axial Tomography (CAT)

In this computer control the operation of X-ray equipment also evaluates the image produced. CAT helps the doctors in re-constructive surgery and testing breast cancer.

4. Prostheses Design and Reconstruction

Orthopaedic Surgery needs the creation and implantation of artificial limbs. By using diagnostic scanning procedures, technicians can digitise an accurate picture of the damaged bone and visually compare it for fit and function. The prosthesis is designed, with the help of computer aided manufacturing machinery, to ensure the precise measurements are met. Tooth crows can be created in the dentist office without help of the computer.

5. Computer Aided monitoring

Computers aided monitoring are used in vital signs such as heart beat rate, blood pressure, respiration, temperature etc. Computer-controlled devices are used where patients need constant monitoring such as in ICU Intensive Care Units, post-operative recovery rooms and premature-baby nurseries.

6. Pharmaceutical Design and Testing

Computer techniques help in developing a new drug. It helps in determining the shape of molecule which shows the behaviour. It also helps in checking toxicity of a drug without endangering animal life.

CASE STUDY

Role of women and child welfare is very much changed with the advancement of the technology in agriculture. India is an agricultural country and most of the women practice agriculture. The case study shows the marginalisation of rural woman in agricultural production as a result of technology change. The changes in the rice technology of agriculture were :

(1) A shift in type of seed from the traditional varieties to the short , early maturing one produced by the international rice research institute.

(2) The spread of farm mechanisation in the land preparation and thrashing task.

(3) Changes in certain farm practices such as extensive use of fertilisers, pesticides, weedicides and methods of direct seeding.

These technological changes displaced more women than men. Under the old technology almost half of the labour working a lecture of land were women. The fact is that displacement occurred in the absence of other job opportunities. In these areas of land the worsening unemployment and displacement of women in other villages and towns increased competition for the marginal jobs. The collection and processing of left over grain symbolised relegation of woman to the left over employment opportunities of men.

Women have the ability to convert waste into a food resource for their families. The economic marginalisation of women nevertheless has repercussions on the welfare of both women themselves and their children. The family is the responsibility of women. The burden of restructuring the budget and meeting cash shortages seems to fall on women. This case study also illustrates ability of economically marginalised rural women to make something out of nothing.