Human Population and the Environment

Population Growth, Variation among Nations

✓Our ancestors lived as hunters and gatherers, thus maintaining small numbers, probably less than 10 million.

✓The 18th century marked the start of the Industrial revolution. Human population has expanded.

✓In 1750 the population is 760 million, the population reached 1 billion by 1800

✓After II world war the population rate is accelerated mainly in the developed countries.

✓A billion people were added in between 1960 and 1970 and then another billion between 1975 and 1987.

✓The 20th century started with 1.6 billion people and ended with 6.1 billion

✓From 2.5 billion people in 1950 to 6.5 billion in 2005. by 2050, this number could raise to more than 9 billions.

✓The explosive growth in the past 200 years has had its impact on the disparity in living standards between nations and within nations, resource use and the environment.

- ✓ Our landscapes have changed drastically and will continue to change with human population growth.
- ✓ There are cultural, economical, political and demographical reasons that explain the differences in the rate of population control in different countries.
- ✓ **Global Population growth:**
- ✓ While the rate at which the world's population is increasing has slowed, the population continues to grow. The rate of the world's annual population change can be expressed as a percentage.
- ✓ Annual rate of natural population change (%) =

  Birth rate – Death rate/1,000 persons x 100
- ✓ Birth rates and death rates are decreasing world wide, but better access to medical care, more widespread immunization and improved sanitation have meant that death rates have fallen more steeply than birth rates.
- ✓ So while the exponential growth rate has declined to a slower rate from 2.2% to 1.2% between 1963 and 2005, the same period has seen the population base being almost doubled from 3.2 to 6.5 billion

- ✓ Furthermore, the exponential growth rate has been drastically different in developed countries (0.1%annually) compared with developing nations(1.5% annually)
- ✓ **Population Explosion: Family Welfare Programme:**
- ✓ In response to our phenomenal population growth, India seriously took up an effective family welfare programme in 1951.
- ✓ This programme objective is to reduce birth rates to the extent necessary to stabilise the population at a level which is consistent with the requirement of the national economy.
- ✓ Slogan such as Hum do hamare do indicated that each family should not have more than two children.
- ✓ The best decision for the method to be used by a couple good advise from doctors or social workers who can suggest the full range of methods available.
- ✓ Informing the public about the various contraceptive methods.
- ✓ This must done by Government agencies, elected representatives of the people at the central and state level.
- ✓ The decision to limit family size depends on a couple's background and education

- ✓ The importance of an effective FWP is crucial for India's growing population.
- ✓ The first green revolution in the 1960s produced a large amount of food, but has led to several environmental problems.
- ✓ Now a new green revolution is needed to provide enough food for our growing population that will not damage the environment.

Methods of sterilisation

- ✓ FWP advocates a variety of measures to control the population. Permanent methods are done by a minor surgery.
- ✓ Tubectomy in females
- ✓ Vasectomy in males
- ✓ Intrauterine devices (copper T)
- ✓ Oral contraceptive pills
- ✓ Injectable drugs are available that prevent sperms from fertilising the ovum.

- ✓ At the global level, in the year 2000, 600 million (57%) of women in the reproductive age group were using some method of contraception.
- ✓ However, the contraceptive measures is higher in developed countries and lower in developing countries.(68% and 55% respectively)

Urbanisation

- ✓ In 1975, only 27% of the people in the developing world lived in urban areas.
- ✓ By 2000, this had grown to 40% and by 2030 will grow to 56%
- ✓ The developed world is already highly urbanized with 75% of its population living in urban areas.
- ✓ The migration of people to towns and cities from villages
- ✓ As a town grows into a city, is not only spreads outwards into the surrounding agricultural lands or natural areas such as forest, grasslands and wetlands but also grows skywards with high-rise buildings.
- ✓ Good urban planning is essential for rational land use, for upgrading slum areas, improving water supply and drainage systems, providing

- ✓ Adequate sanitation, developing effective waste water treatment plants and an efficient public transport system.
- ✓ All the issues under purview of Municipal Corporations, better living conditions can become reality only if every citizen plays an active role in managing the environment.
- ✓ Every urban individual has the ability to influence a urban management through develop the parks, gardens and natural green spaces.
- **Urban poverty and the Environment:**
- ✓ The number of poor people living in urban areas is rapidly increasing .
- ✓ The people live in urban slums and suffer from water scarcity and unsanitary conditions
- ✓ Urban poverty is even more serious than rural poverty, as unlike in the rural sector, the urban poor have no direct access to natural resources such as relatively clean river water and fuel wood.
- ✓ Pollution

Environment and Human Health

- ✓ Environment related issues that affect our health have been one of the most important triggers in the increasing awareness of the need for better environmental management.
- ✓ The changes in environment induced by human activities.
- ✓ We expect Urbanization and Industrialization to bring in prosperity, but on another hand, it leads to diseases related to overcrowding and poor quality drinking water, resulting in an increase various infective diseases.
- ✓ High density city traffic leads to an increase in respiratory diseases.
- ✓ Pesticides have affected both farm workers and all of us who consume the products.
- ✓ Modern medicine (antibiotics) promised to solve many health problems but bacteria found ways to develop resistant strains.
- ✓ Thus, development has created several long-term health problems.
- ✓ A healthy society will bring about a better way of life only if it is associated with a stabilising population growth.

- **Environmental Health**

- ✓ The quality of life, that are determined by physical, chemical, biological, social and psychosocial factors in the environment (Defined by WHO)
- ✓ Our environment affects health in a variety of ways i.e. climate and weather.
- ✓ The public health depends on quality food, safe drinking water and adequate shelter.
- ✓ Global climate change has serious health implications.
- ✓ Millions of children die every year due to diarrhea from contaminated water or food.
- ✓ More than 3 million children die each year from water-borne diseases across the world.
- ✓ Millions of people, mainly children, have poor health due to parasitic infections such as amebiasis and worms.
- ✓ Hundreds of millions of people suffer serious respiratory diseases.
- ✓ Millions of people are exposed to hazardous chemicals in their workplace or homes that lead to poor health.

Important Strategic Concerns

- ✓ To provide clean portable water and nutrition to all people.
- ✓ Reducing the environmental consequences of industrial and other pollutants.
- ✓ Changing agricultural patterns
- ✓ Changing industrial systems
- ✓ There is a need to change from using conventional to non conventional energy sources.

Climate and Health: Natural disasters can severely affect the health of a community.

- ✓ Approximately 80,000 deaths which occur world - wide each year as a result of natural disasters, about 90 to 95% in poor countries.
- ✓ The cyclone in Orissa in 1999 caused 10,000 deaths. The total number of people affected was estimated at 10 to 15 million.

Globalisation and Infectious Diseases:

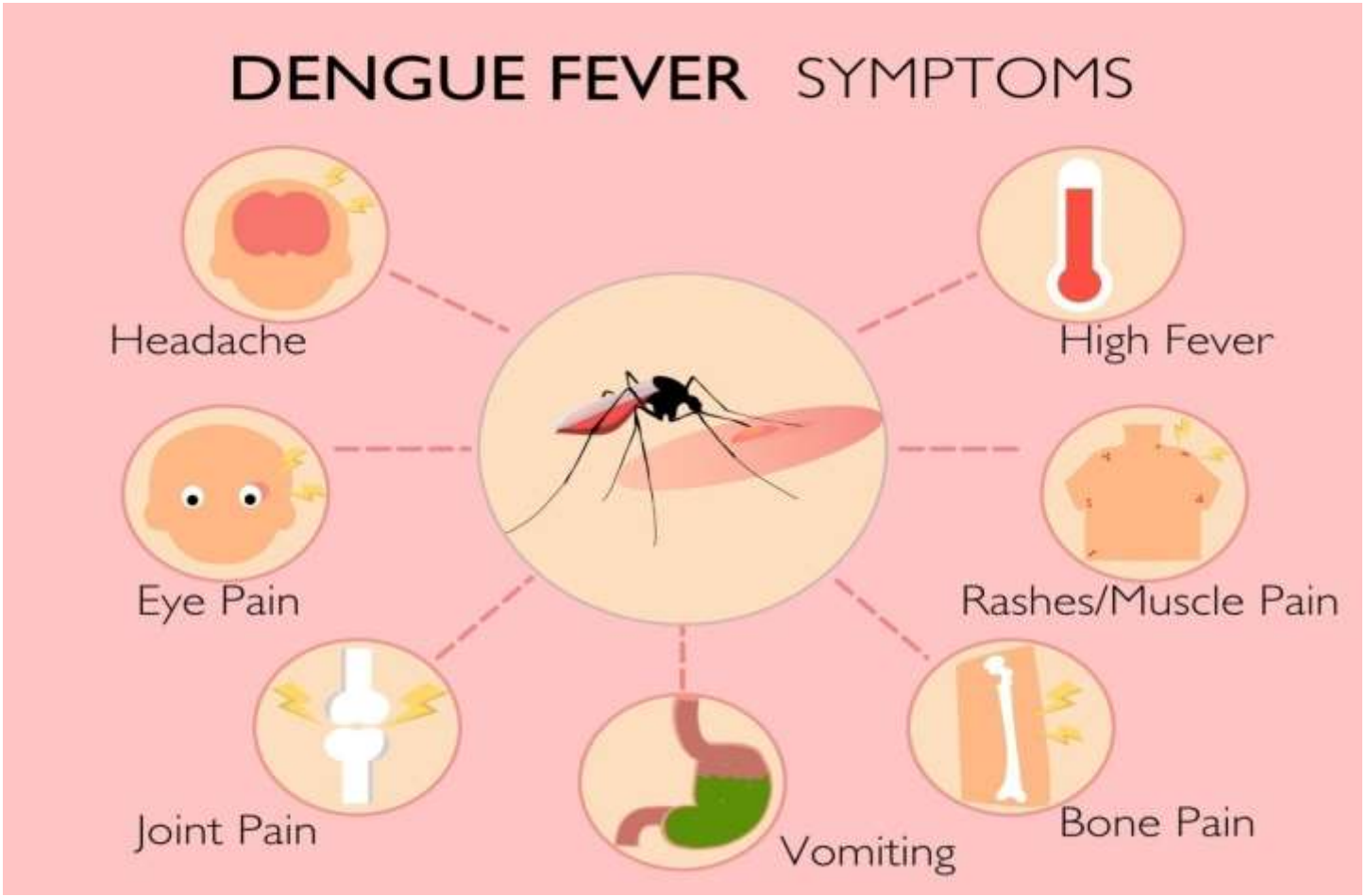
- ✓ Globalisation is a world wide process which includes the internationalisation of communication, trade and economic organisation.
- ✓ It involves changes of social, economic and political adjustments.
- ✓ Malaria and Tuberculosis
- ✓ In addition, AIDS and SARS (Severe Acute Respiratory Syndrome)
- ✓ TB kills approximately 2 million people each year
- ✓ Until 50 years ago, there were no drugs to cure tuberculosis. Now, strains that are resistant to one or more anti-TB drugs have emerged.
- ✓ Malaria is a life-threatening parasitic disease transmitted by mosquitoes.
- ✓ It is caused by a parasite i.e. Plasmodium, was discovered in 1880.
- ✓ It was found that, the parasite is transmitted from one person to another person through female Anopheles mosquito.
- ✓ 40% of the world's population risk getting malaria.
- ✓ Malaria has found in tropical and sub-tropical regions of the world and caused more than 200 million people illness and one million deaths annually (WHO,2009)

Water Related Diseases:

- ✓ Globally, about 2.4 billion people live under highly unsanitary conditions.
- ✓ Poor hygiene increases the exposure to risk of incidence and spread of infectious diseases.
- ✓ **Water-borne diseases:** They are caused by dirty water contaminated by human and animal wastes, especially from urban sewage or by chemical wastes from industry and agriculture.
- ✓ Some of these diseases, such as cholera and typhoid
- ✓ Diarrhea, dysentery, polio, meningitis and hepatitis are caused due to improper drinking water.
- ✓ Excessive levels of nitrates cause blood disorders when they pollute water sources.
- ✓ Pesticides enter drinking water in rural areas cause cancer, neurological disorders and infertility.
- ✓ **Water based diseases** are caused by aquatic organisms that live a part of their life cycle in water and another part as a parasite in man lead to several diseases.

Water related vector diseases:

- ✓ They are caused by insects like mosquitoes that breed in stagnant water spread diseases such as malaria and filariasis.
- ✓ Other vector-borne diseases in India include Dengue fever.



- ✓ Dengue is a mosquito borne viral infection in tropical and sub-tropical regions.
- ✓ Dengue virus is transmitted by Aedes aegypti. Dengue is widespread throughout the tropics, with local variations in risk influenced by rainfall, temperature, relative humidity and unplanned rapid urbanization.

Water scarcity diseases:

- ✓ In areas where water and sanitation is poor, there is a high transmission of diseases like tuberculosis, leprosy and tetanus which occur when one's hands are not properly washed.

Cancer and the Environment

- ✓ Cancer is caused by the uncontrolled growth and spread of abnormal cells that may affect almost any tissue of the body.
- ✓ Types of cancers: colon, lung, rectal, stomach, breast and cervical cancer.
- ✓ In India, oral and pharyngeal cancers form the most common type of cancers, which are related to tobacco chewing.

- ✓ More than 10 million people are diagnosed with cancer in the world every year.
- ✓ Cancer is preventable by stopping smoking, providing healthy food and avoiding exposure to cancer-causing agents (carcinogens)
- ✓ Most of the common cancers are curable by a combination of surgery, chemotherapy or radiotherapy (X-ray technologies)
- ✓ Promoting and strengthening comprehensive national cancer-control programs
- ✓ Building international networks and partnerships for cancer control
- ✓ Developing guidelines on disease and programme management
- ✓ Tobacco smoking is the single –largest preventable cause of cancer in the world. It causes 80% to 90% of all lung cancer deaths.

HUMAN RIGHTS

- Several environmental issues are closely linked to human rights.
- These includes equitable distribution of environmental resources, the utilisation of resources and Intellectual property rights, conflicts between people and wildlife, resettlement issues around projects such as dams and mines.

Value Education:

- Value education is bring about to a new sustainable way of life.
- Education, through both formal and non-formal processes, must thus address understanding environmental, natural and cultural values, social justice, human heritage, equal use of resources, managing common property resources and the causes of ecological degradation.
- Values in environment education must bring in several new concepts.
- Why and how can we use less resources and energy?
- Why do we need to keep our surroundings clean?
- Why should we use less fertilisers and pesticides in farms?
- Why is it important for us to save water and keep our water sources clean?
- Segregate our garbage into degradable and non-degradable types before disposal?

- All these issues are linked to the quality of human life and go beyond simple economic growth.

Environmental Values:

- Every human being has a great variety of feelings for different aspects of his or her surroundings.
- Environmental values are inherent in feelings that bring about sensitivity for preserving nature as a whole.
- Our environmental values must also translate into pro-conservation actions in all our day-to-day activities.
- Most of our actions have adverse environmental impacts unless we consciously avoid them.
- Values lead to process of decision making which leads to action.
- For value education in relation to the environment, this process is learned through an understanding and appreciation of nature's oneness and the importance of its conservation.
- Environmental problems created by development are due neither to the need for economic development, nor to the technology that produces pollution, but rather to lack of awareness of the consequences of unlimited and unrestrained anti-environmental behavior.

- Each action by an individual must be linked to its environmental consequences in his/her mind, so that a value is created that strengthens pro-environmental behaviour and prevents anti environmental action.
- This cannot happen unless new educational process are created that provide a meaning to what is taught at school and college level.
- They want an explanation for things happening around them that can help them make decisions and through this process develops values.
- It is this innate curiosity that leads to a personalised set of values in later life.
- Providing appropriate meanings for such questions related to our own environment develops a set of values that most people in society begin to accept as a norm.
- Thus, pro-environmental actions begin to move from the domain of individuals to that of a community.
- At the community level, this occurs only when a critical number of people become environmentally conscious so that they constitute a pro-environment lobbying force that makes governments and other people accept good environmental behaviour as an important part of the development.

- An environmentally conscious individuals we need to develop a set of values that are linked with a better and more sustainable way of life for all people.
- There are several positive as well as negative aspects of behaviour that are linked to our environment.
- The positive feelings that support environment include a value for nature, cultures, heritage and equity.
- We also need to become more sensitive to aspects that have a negative impact on the environment, loss of species, pollution, poverty, corruption in environmental management, the rights of future generations and animal rights.

Valuing Nature:

- We have a great responsibility to protect life in all its glorious forms and must therefore respect the wilderness with all its living creatures.
- On the one hand we need to protect natural ecosystems, while on the other hand we must protects the rights of the local people.
- Apart from valuing the diversity of life itself, we must also learn to value and respect diverse human cultures.

- Many of the tribal cultures of our country are vanishing because those with more dominant and economically advanced ways of life do not respect their lifestyles.
- **Valuing cultures:**
- Every culture has right to exist.
- Tribal people are frequently most closely linked with nature and we have no right to impose on them our own modern way of life.
- **Human Heritage:** there is much beautiful on our earth – the undisturbed wilderness, a traditional rural landscape, architecture of a traditional village or town and the value of a historical monument or place of worship.
- While we admire and value the Ajanta and Ellora Caves, the temples of the 10^{th} to 15^{th} centuries that led to different and diverse styles of architecture, sculpture, the Moghul styles that led to structures such as the Taj Mahal, or the unique environmentally –friendly colonial buildings, we have done little to actively preserve them.
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- **Equitable Use of Resources:**
- The equitable use of resources is now seen as an essential aspect of human well-being.
- **Common Property Resources:**
- Our environment has a major component that does not belong to any individual.
- There are several commonly owned resources that all of us use as a community.
- **Ecological Degradation:**
- The changes in land use from natural ecosystems to more intensive utilisation or marginal lands into intensive agricultural patterns or changes into urban or industrial land carry an ecological price.
- **Women and Child Welfare:**
- There are several environmental factors that are closely linked to the welfare of women and children.
- Every year, nearly 12 million children worldwide have been estimated to have died from the effects of disease and inadequate nutrition.

- Seven out of ten childhood deaths in developing countries can be attributed to five main causes or a combination of them,
- These are: Pneumonia, diarrhea, measles, malaria and malnutrition.
- Around the world, 3 out of every four children suffer from at least one of these conditions.
- **Pneumonia:** Acute respiratory infections, most frequently pneumonia is a major cause of death in children under five years, killing over two million children annually. (WHO, 2009)
- **Measles:** Measles is a rash that appears with fever and body ache in children and is caused by a virus.
- It infects over 2,00,000 children and kills over 1,50,000 children under the age of five cases, prompt recognitions of conditions that occur in association with measles and improved nutrition.
- Breast feeding and vitamin A supplements.
- Measles can be prevented by a vaccine.

- **Malnutrition:**
- Lack of access to food, inadequate breast feeding, providing the wrong type of food or insufficient food.
- Children between 6 months and 2 years of age are at increased risk of malnutrition.
- There are strong connections between the status of environment and the welfare of women and children in India.
- Women, especially in lower-income groups, both in the rural and urban sectors work longer hours than men.
- Their work pattern differs and is more prone to health hazards.
- Women and girls tend to compromise and get inadequate nutrition.
- They are often the last to eat, as their role in traditional society is to cook the family meal and feed their family members first.
- In view of access to educational facilities, the girl child is given less importance as compared to boys in India.
- They are unable to compete with men in later life. This social – environmental divide is a major concern that needs to be corrected throughout the country.

- **Role of Information Technology in Environment and Human Health:**
- Better understanding of environmental concerns and issues related to human health has exploded during the last few years due to the sudden growth of Information Technology.
- With the help of IT we can do several tasks.
- GIS(Geographical Information systems) is a tool to map land use patterns and document change by studying digitalized toposheets.
- Specialized software can analyse data for epidemiological studies, population dynamics and a variety of key environmental concerns.

- **Environmental Legislation**
- India is the first country in the world to have made provisions for the protection and conservation of environment in its constitution.
- On 5th June 1972, environment was first discussed as an item of international agenda in the U.N. Conference on Human Environment in Stockholm and thereafter 5th June is celebrated all over the world as World Environmental Day.
- **The AIR (Prevention and Control of Pollution) Act, 1981**
- The act provides for prevention, control and abatement of air pollution.
- In the act, air pollution has been defined as the presence of any solid, liquid or gaseous substance in the atmosphere in such concentration as may be or tend to be harmful to human beings or any other living organisms or environment.
- Pollution control boards at the central or state level have the regulatory authority to implement the Air act.

- The boards have strictly follows the norms or standards laid down by the boards under section 17, regarding the discharge of emission of any air pollutant.
- Section 20 of the act has provision for ensuring emission standards from automobiles.
- As per section 19, in consultation with the state pollution control board, the state government may declare an area within the state as “air pollution control area”.
- **The Water (Prevention and Control of Pollution) Act, 1974**
- It provides maintaining and restoring the wholesomeness of water by preventing and controlling its pollution.
- Pollution is defined as such contamination of water, or such alteration of the physical, chemical or biological properties of water, or such discharge as is likely to cause a nuisance or render the water harmful or injurious to public health and safety or harmful for any other use or to aquatic plants and other organisms or animal life.

- The central and state pollution control boards are widely represented and are given comprehensive powers to advise, coordinate and provide technical assistance for prevention and control of pollution of water.
- **Central Pollution Control Board (CPCB):** it advises the central govt. in matters related to prevention and control of water pollution.
- Coordinates the activities of state pollution control boards and provides them technical assistance and guidance.
- Organizes training programs for prevention and control of pollution
- Organizes comprehensive programs on pollution related issues through mass media.
- Collects, complies and publishes technical and statistical data related to pollution.
- Prepares manuals for treatment and disposal of sewage and trade effluents.
- Lays down standards for water quality parameters.
- Plans nationwide programs for prevention, control or abatement of pollution.
- Establish and recognizes laboratories for analysis of water, sewage or trade effluent sample.

- **State Pollution Control Boards:** also have similar functions to be executed at state level and are governed by the directions of CPCB
- The board advises the state government with respect to the location of any industry that might pollute a stream or a well.
- It lays down standards for effluents and is empowered to take samples from any stream, well or trade effluent or sewage passing through an industry.
- The state board is empowered to take legal samples of trade effluent in accordance with the procedure laid down in the act.
- **WILD LIFE ACT, 1972**
- The act, a landmark in the history of wildlife legislation in our country, came into existence in 1972.
- The Indian board of wildlife was created in 1952 in our country, which after the enactment of the wildlife act actively took up the task to setting up wildlife National parks and Sanctuaries.
- It defines the wildlife terminology.

- It provides for the appointment of wildlife advisory board, wildlife warden, their powers, duties.
- Under the Act, comprehensive listing of endangered wildlife species was done for the first time and prohibition of hunting of the endangered species was mentioned.
- Protection to some endangered plants is also provide the act.
- The Act provides for setting up of National Parks, Wildlife Sanctuaries etc.
- The act provides for the constitution of Central Zoo Authority.
- There is provision for trade and commerce in some wildlife species with license for sale, possession, transfer etc.
- The act imposes a ban on the trade or commerce in scheduled animals.
- It provides for legal powers to officers and punishment to offenders.

- **FOREST (CONSERVATION) ACT, 1980**
- This act deals with the conservation of forests and related aspects.
- The Act covers under it all types of forests including reserved forests, protected forests or any forested land irrespective of its ownership.
- The state government has been empowered under this act to use the forests only forestry purpose.
- It makes provision for all types of forests and for this purpose there is an advisory committee which recommends funding for it to the central government.
- Any illegal non-forest activity within a forest area can be immediately stopped under this act.
- **1992 Amendment in the Forest Act**
- In 1992, some amendments was made in the act which made provisions for allowing some non-forest activities in forests without cutting trees or limited cutting with prior approval of central government.
- Cultivation of Tea, Coffee, Spices, rubber and plants which are cash-crops are included under non-forestry activity and not allowed in reserve forests.
- Even cultivation of fruit bearing tress, oil yielding plants or plants of medicinal value in forest area need to be first approved by the central government authorities.