UNIT V HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare –Environmental impact analysis (EIA)- -GIS-remote sensing-role of information technology in environment and human health – Case studies.

POPULATION GROWTH:

Stone age – quite stable

Droughts, outbreak of diseases lead to human deaths. 14^{th} century A.D experienced large scale mortality due to plague – about 50% of people in Asia and Europe died due to the disease.

Science and technological advancement has increased the expectancy of human. People started living with good sanitation food and medical facilities increase in population exponentially. In agriculture based families children are said to be assets who help the parents in fields. Therefore, in developing countries the population increase is at a rate of 3.4% per year.

POPULATION CHARACTERISTICS AND VARIATIONS AMONG NATIONS:

1. Exponential growth: 1,3,5…… If a quantity varies by a fixed % 10^1, 10^2 etc.
2. Doubling Time Td = 70/r 2%
3. Total Fertility Rate (TFR) is 1.9 developing countries. 4.7 developing countries and 6.1 in 1950
4. Infant mortality: % of infants died out of those born in a year last 50 years.
5. Replacement level: Under low life expectancy and high infant mortality 2.7 in developing countries and 2 in developed countries.
6. Life expectancy: The average no. of years a new born baby is expected to live. The life expectancy of global males and females has risen from 40 to 55.5 years. In India 22.6 and 23.3 in 1900 & 60.3 and 60.5 in 2000. In Japan and Sweden 77-77.4 & 82-84 years

POPULATION EXPLOSION:

Population explosion means the tremendous increase in the number of people. It is a known fact that the increase of population is playing vital role of all environmental damage. Most of our natural resources are under threat because of the population growth. If the exploitation of resource is going on in this trend, the resources will be exhaust shortly. Population explosion

increase disease, economic inequity and environmental abuse. Therefore we need population stabilization to achieve good health, education and prosperity.

Reason for population explosion:

1. Increase in birth rate in developed countries due to illiteracy
2. Invention of modern medical facilities reduces mortality rate.

The first ‘green revolution’ in the ‘60s 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 land, kill rivers by building large dams, or spread at the cost of critically important forests, grasslands and wetlands. The world’s most populous regions are in coastal areas. These are critical ecosystems and are being rapidly destroyed. Global climate change is now a threat that can affect the very survival of high population density coastal communities. In the sea, fish populations are suffering from excessive fishing. Once considered an inexhaustible resource, over fishing has depleted stocks extremely rapidly. It will be impossible to support further growth in coastal populations on existing fish reserves. Human populations will inevitably expand from farm lands into the remaining adjacent forests.

Planning for the future

How Governments and people from every community meet challenges such as limiting population size, protecting the natural environment, change their consumer oriented attitudes, reduce habits that create excessive waste, elevates poverty and creates an effective balance between conservation and development will determine the worlds future.

The Urban Challenge

Population increases will continue in urban centers in the near future. The UN has shown that by 2025 here will be 21 "megacities" most of which will be situated in developing countries. Urban centers are already unable to provide adequate housing, services such as water and drainage systems, growing energy needs, or better opportunities for income generation.

FAMILY WELFARE PROGRAM:

- Population explosion must be differenced
- Population is not controlled will deplete all resources
- Family planning
- Allows couples to describe their family size and also time spacing of their offspring
- Provide importance, knowledge and benefits of their small family to people
- Education in held and family welfare system

- Sex education awareness

WHO estimated 50% of worlds married couples adopted family planning measures, 300 million couples not assessed to family planning.

In response to our phenomenal population growth, India seriously took up an effective Family

Planning Program which was renamed the Family Welfare Program. Slogans such as 'Hum do hamare do' indicated that each family should not have more than two children. It however hastaken several decades to become effective. At the global level by the year 2000, 600 million, or57% of women in the reproductive age group, were using some method of contraception. However the use of contraceptive measures is higher in developed countries – 68%, and lower in developing countries - 55%. Female sterilization is the most popular method of contraception used in developing countries at present. This is followed by the use of oral contraceptive pills and intrauterine devices for women, and the use of condoms for men.

Methods of sterilization

India's Family Welfare Program has been fairly successful but much still needs to be achieved to stabilize our population. The most effective measure is the one most suited to the couple once they have been offered all the various options that are available. The Family Welfare Program advocates a variety of measures to control population. Permanent methods or sterilisation are done by a minor surgery. Tubectomy in females is done by tying the tubes that carry the ovum to the uterus. Male sterilization or vasectomy, is done by tying the tubes that carry the sperm. Both are very simple procedures, done under local anesthesia, are painless and patients have no post operative problems. Vasectomy does not cause any loss in the male's sexual ability but only arrests the discharge of sperm. There are several methods of temporary birth control. Condoms are used by males to prevent sperms from fertilizing the ovum during intercourse. Intrauterine devices (Copper Ts) are small objects which can be placed by a doctor in the uterus so that the ovum cannot be implanted, even if fertilized. They do not disturb any functions in the woman's life or work.

ENVIRONMENT AND HUMAN HEALTH:

Environment is defined as man along with his surroundings, which consists of biotic, abiotic and sociological components. Therefore, when we cause danger to these components, which surrounds us, they in turn affect our health.

The environmental dangers created by man are many: Population explosion, unregulated urbanization, creating water, air and landscape pollution, deforestation, desertification, use of pesticides in agriculture etc. Every one of these has implications for the health of the individual as well as society as a whole. None can be ignored because the scale of potential calamity is increasing

day by day.

Health hazards may be arising from: water contamination or pollution, air pollution, use of pesticides enters through food chain, radiation effect of nuclear water, diseases caused from improper disposal of solid wastes and also due to noise pollution.

Malthusion Theory: According to Thomas Malthus in 1978, human population tends to increase at an exponential or compound rate, while food production either increases slowly or remains stable. This will result in poverty, starvation, disease, crime and misery.

Marxian Theory: Karl Marx opined that slowing down of population growth and alleviation of crime, disease, starvation, misery and environmental degradation could be achieved through social justice.

HUMAN RIGHTS:

1. Human rights means that a human being must enjoy on this earth
2. Foundation of human was laid in 13^{th} century. "Universal Declaration of Human Rights (UNDHR) by UNO on 1012.1948
3. It highlights on protection to all individuals against injustice and human right violation
4. UNDHR defines specific rights to life, liberty, security, freedom of thought, association, freedom of movement right of equal pay for equal work, right to form or join union, right to health care, education etc.
5. Universal declaration rights are universal but disparity between developing and developed countries.
6. Poverty and population leads to violation of human rights.

   WHO estimates One out of every five is malnourished, lacks clean drinking water, lacks hygienic conditions and health facilities. one out of 3 lack fuel for cooking 1/5 is desperately poor every year 40 million people die due to contaminated water
7. Acute scarcity of employment
8. Merit of universal education and child labour prevention is of much less importance than his struggle for existence.

VALUE EDUCATION:

Education is one of the most important tools in bringing about socioeconomic and cultural progress of a country. The objective of education should not be merely coaching the students to get through the exams with good results and get some good job. Education does not

simply mean acquiring information but using the resources within the limits of ethical value.

The scientific and technological advancements have shrunk the world into a village. But in the drive to development man has become too materialistic, self centered and over ambitious. Value based education has a very significant role in providing proper direction to youth to inculcate positive attitude and to teach them the distinction between right and wrong. It teaches them to be compassionate, peace loving, helpful, generous and tolerant so that they can move towards more harmonious, peaceful, enjoyable and sustainable future. Value education help in arriving value based judgements based on practical understanding of various natural principles.

Value education increases awareness about our national history, our cultural heritage, national pride, constitutional rights and duties, national integration, aommunity development and environment.

It is crucial to the retention of national identity, peaceful and harmonious society. Education should give overall development of the student personality. The main of education is to produce citizens with sound character and health. Good citizens are the only hope for the progress and prosperity of the country. Life based upon good principles is an essential requisite.

Therefore moral education should be included in the school curriculum. The curriculum should provide enough opportunity for pupils to acquire a considerable amount of knowledge that is essential for morally responsible living in our democratic society.

Value education shall prepare individuals for participation in social life and acceptance of social rules.

Schools should provide a healthy environment for sharing responsibilities of community life and relationships.

Value based environmental education:

Environmental education is something that every person should be well versed with. The principles of ecology and fundamentals of environment help to create a sense of earth citizenship and a sense of care for the earth and its resources - a sense of commitment towards the management of the resources in a sustainable way so that our children and grand children too have a safe and clean planet.

Following the Supreme Court directives 1998 environmental education has been included in the curriculum right from the school stage to university level. The objective of it is to make everyone environment literate. Let us see how environmental education can be made value based one.

1. Preparation of text books materials on environmental education – to built a positive attitude towards environmental factors.

2. Social values like love, tolerance, compassion can be woven into env. Education. This will help to nurture all forms of life and biodiversity.

3. Cultural and religious values: Our culture and religions teach us not to exploit nature but to perform such functions which project and sacred nature. Therefore these valuescan be added up with env. Education.

4. Env. Education should stress on earth centric views rather than human centric view such that it include the ethical values.

5. Global values: Stress on the concept human is part of nature and all natural processes are inter linked and they are in harmony. If this harmony is disturbed it may lead to imbalance in ecology and catastrophic results.

6. Spiritual values: highlights on self contentment, discipline, reduction of wants etc. This will reduce our consumerist approach If the mentioned values are incorporated in env. education, the goal of sustainable development and env. conservation can be easily attained. Value based env. Education can bring about a total transformation of our mind set, our attitudes and life style to protect nature.

HIV / AIDS:

AIDS-Acquired Immuno Deficiency Syndrome

Acquired means disease is not hereditary but develops after birth from contact with a disease causing agent. Immune deficiency means that the disease is characterized by a weakening of immune system

HIV-Human immuno deficiency virus cause AIDS disease.virus is passed through iinfected blood,semen

Transmission of AIDS

- Prostitution
- Homosexual activity
- Use of contaminated syringe in blood transfusion and drug addicts
- Maternal-fetal transmission

Symptoms:

- Persistent fever
- Fatique, weekness
- Diarrhea
- Wait loss
- Low number of T cells in blood
- Swelling lymph nodes, neck

- Susceptible to infections

Treatment:

AZT-Azidi thymidine

DDI – Dideoxyinosine

Screening test:

- ELISA-Enzyme Linked Immuno Sorbant Assay
- Western blot
- Polymer chain reaction
- Saliva and urine test
- Branched DNA test
- Immuno fluorescent antibody assay

The major precautions to avoid AIDS

- education
- prevention of blood borne HIV transmission
- primary health care
- counseling services
- drug treatment

WOMEN AND CHILD WELFARE:

- The Department of Women and Child Development (Government of India) was set up in the year 1985 as a part of the Ministry of Human Resource Development to give the much needed impetus to the holistic development of women and children. The Department was upgraded as the Ministry of Women and Child Development in January 2006.
- The Ministry is the nodal ministry for the advancement of women and children; it formulates plans, policies and programs; enacts/amends legislation, guides and coordinates the efforts of both governmental and non-governmental organisations working in the field of women and child development. The Ministry also implements certain programs for the welfare and uplift of women and children. These programs cover welfare and support services, training for employment and income generation, awareness generation and gender sensitization.
- The Ministry implements the Integrated Child Development Services (ICDS) providing a package of services comprising supplementary nutrition, immunization, health check up and referral services, pre-school non-formal education. The Ministry is also implementing Swayamsidha which is an integrated scheme for empowerment of women. Major policy initiatives undertaken

by the Ministry in the recent past include universalization of ICDS and Kishori Shakti Yojana, launching a nutrition program for adolescent girls, establishment of the Commission for Protection of Child Rights and enactment of Protection of Women from Domestic Violence Act.The Ministry has 6 autonomous organisations viz. National Institute of Public Cooperation and Child Development (NIPCCD), Rashtriya Mahila Kosh (RMK), Central Social Welfare Board (CSWB), Central Adoption Resource Agency (CARA), National Commission for Protection of Child Rights (NCPCR) and National Commission for Women working under its aegis. The Food & Nutrition Board (FNB), set up in 1964, is an attached office of the Ministry. The Ministry has also set up a National Resource Centre for Women (NRCW).

- The Ministry has formulated the National Policy for Women Empowerment, 2001.

ENVIRONMENTAL IMPACT ANALYSIS:

INTRODUCTION

The effects of actions that are not accounted for in the normal market transactions need to be considered explicitly in the decision-making processeson projects. These effects are to be identified, assessed, and evaluated against the economic advantages arising out of a given action. In this context, the environmental impact assessments / appraisals are considered to be the first step in this process because they given an opportunity to man to consider the effects of his actions on the environment. Economic development is the result of the interaction between natural resources and technology supported by and designed for people. People are the center for development. Therefore, it is rightly said that all human activity, be it economic, social or anything else, is essentially directed at satisfying “needs” and “wants” of man through “altering” and “using” environmental resources.

TYPES AND DIMENSIONS OF A PROJECT:

Broadly, there are two types of projects. The firn of new wants and needs in society. They ultimately promote consumerism in the society and thereby increase the number of manufacturing projects. Thus, both are interrelated. Each project has two dimensions: (a) the intended objectives / purpose – they are also called stated goals / benefits; and (b) the unintended consequence.

They are also called externalities or social costs which are unplanned, unwanted, and unanticipated. Environmental management or planning is the study of the unintended consequence of a project. Its purpose is to identity, examine, asses, and evaluate the likely and probable impacts of a proposed project on environment and, thereby, to work out the remedial action plans to minimize the incidence of adverse impact. It is not anti-development nor is it against the projects. Its goal is development without damage or least damage.

STRESSES ON ENVIRONMENT:

Environmentalists have identified four types of different stresses or pressures that are being continuously inflicted on environment. They are:

(i) Eutrophic Stress: Refers to the release of various kinds of wastes into the river and other water bodies and their consequent drying.

(ii) Exploitative Stress: Refers to the exploitation of natural resources endowment for production and consumption purposes through agriculture, industry, extraction, fishing etc. It is important to note that29 the rate of exploitation has a relevance to the nature's capacity to reproduce.

(iii) Disruptive Stress: Refer to the physical alterations in nature resulting from such activities like forest clearance, highways, railways, factory buildings and so on. These physical changes disturb the environmental and ecological balance.

(iv) Chemical and Industrial Stress: This results mainly from the developments in "science and technology" and their applied fields like industry, warfare and agriculture. This comprises mainly the pollutants and effluents of all types, radiation etc.

Strategies to meet these threats to natural environment through pollution, destruction and over-use can be: (a) preventive or (b) regulatory. It is in this context that the environmental appraisal of projects is gaining significance with a hope of achieving sustainable development in harmony with environment.

MEANING AND SCOPE OF ENVIRONMENT:

The ward "environment" is defined to include everything external to man / organism. It covers the region, surroundings, or circumstances in which anything exists. It is broadly divided into two components. The first one is the a biotic or inorganic milieu, comprising the physical elements like land, water, atmosphere, climate, sound, odours, and tastes. They are the inanimate elements of the habitat systems. The other one is the biotic or the organic milieu consisting of animals, plants, bacteria, viruses, all other living organisms, and the social factors including aesthetics. They are the animate elements.

There is another definition particularly relevant in the context of projects. Here, the term "environment" is defined as: The surrounding zone (the specific zone to be affected by the project), all natural resources (physical and biological), and the human resources (people, economic development and quality of life values). This definition is comparatively more specific, focused, and clear cut than the earlier one which was too general and unfocussed. This is more suited to operationalize, quantify, and measure the environmental impacts of a given action. The contentious issue in this definition is the surrounding zone or the project vicinity. However, a distinction has to be made between the "legal boundary" which is the area legally occupied by a project, and the "environmental boundary" which

stretches much beyond the legal boundary. In fact, this is he area around the project that likely to be affected environmentally by the project operations. The extent of environmental boundary for a project depends, among other things, on the diffusion factors like wind speed and directions, elevations, etc. It varies from project to project and location to location for the same project.

There is yet another definition of environment as below:

The external, natural, physical and residential conditions which affect man directly and indirectly and which are, in turn, influenced by economic decisions and technological developments. This definition implies a complex interactive model between man, environment, and science and technology, the outcome of which will be economic development. As a matter of fact, projects facilitate such an interaction. Environmental management, a terms encompassing environmental planning, protection, monitoring, assessment, research, education, conservation, and sustainable use of resources, is now accepted as a major guiding factor in all the economic decision-making processes on development or otherwise. Subsequently, a wide network of legislation came into being. Now, environmental clearance for all the major projects on the basis of their Environmental Impact Statement (EIS) has become legally mandatory.

GEOGRAPHIC INFORMATION SYSTEM (GIS):

A geographic information system (GIS) is a computer system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data. The acronym GIS is sometimes used for geographical information science or geospatial information studies to refer to the academic discipline or career of working with geographic information systems and is a large domain within the broader academic discipline of Geo informatics. What goes beyond a GIS is a spatial data infrastructure, a concept that has no such restrictive boundaries.

In a general sense, the term describes any information system that integrates, stores, edits, analyzes, shares, and displays geographic information. GIS applications are tools that allow users to create interactive queries (user-created searches), analyze spatial information, edit data in maps, and present the results of all these operations. Geographic information science is the science underlying geographic concepts, applications, and systems.

GIS is a broad term that can refer to a number of different technologies, processes, and methods. It is attached to many operations and has many applications related to engineering, planning, management, transport/logistics, insurance, telecommunications, and business. For that reason, GIS and location intelligence applications can be the foundation for many location-enabled services that rely on analysis and visualization.

ROLE OF INFORMATION TECHNOLOGY IN ENVIRONMENT AND HUMAN HEALTH:

Computer based instruments for environment studies:

There are several on-line use instruments by which data can be collected automatically at fixed interval of time.

Eg.1. Instruments for monitoring and analysis of meteorological parameters, the acoustic sounding system, radar is used

2. Atomic absorption spectrophotometer (AAS) – performs complex chemical and heavy metal analysis in water and waste water.
3. Inductive coupled plasma spectrometer (ICPS), attached with powerful computers to facilitate easy manipulations, is used for waste water analysis.

Application of computers in the field of Environment & human Health:

1. Unknown parameters can be stimulated by computer techniques
2. EIA(Environmental Impact Assessment) problems can be analyzed
3. Inventories of emission sources are compiled and maintained
4. Net-work analysis, statistical analysis and the status of environmental pollutions can be high lighted
5. Comprehensive administrative system can be developed by using computer network techniques.
6. Remote sensing-Graphical Interface System are useful for coral reef mapping and ocean resources. They are also useful to access the loss of biodiversity/hot spots etc.