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Definition of Environment

ENVIRONMENT

Definition: Environment literally means surrounding and everything that affect an organism during its lifetime is collectively known as its environment.

In another words "Environment is sum total of water, air and land interrelationships among themselves and also with the human being, other living organisms and property".

It includes all the physical and biological surrounding and their interactions. Environmental studies provide an approach towards understanding the environment of our planet and the impact of human life upon the environment. Thus environment is actually global in nature, it is a multidisciplinary subject including physics, geology, geography, history, economics, physiology, biotechnology, remote sensing, geophysics, soil science and hydrology etc.

Scope of Environmental Science

Environmental science is a multidisciplinary science whose basic aspects have a direct relevance to every section of the society. Its main aspects are:

- Conservation of nature and natural resources.
- Conservation of biological diversity.
- Control of environmental pollution.
- Stabilization of human population and environment.
- Social issues in relation to development and environment.
- Development of non-polluting renewable energy system and providing new dimension to nation's security.

Importance of Environmental Science

Environment belongs to all the living beings and thus is, important for all. Each and every body of whatever occupation he or she may have, is affected by environmental issues like global warming, depletion of ozone layer, dwindling forest, energy resources, loss of global biodiversity etc. Environment study deals with the analysis of the processes in water, air, land, soil and organisms which leads to pollute or degrade environment. It helps us for establishing standard,

for safe, clean and healthy natural ecosystem. It also deals with important issues like safe and clean drinking water, hygienic living conditions and clean and fresh air, fertility of land, healthy food and development. Sustainable environmental law, business administration, environmental protection, management and environmental engineering are immerging as new career opportunities for environment protection and managements.

Need for Public Awareness

With the ever increasing development by modern man, large scale degradation of natural resources have been occurred, the public has to be educated about the fact that if we are degrading our environment we are actually harming ourselves. To encourage meaningful public participation and environment, it is necessary to create awareness about environment pollution and related adverse effects. The United Nations conference on Environment and Development held in Rio-de-Janeiro, followed by Earth summit on sustainable Development have high-lighted the key issues of global environmental concern and have attracted the general public towards the deteriorating environment. Any Government at its own level can't achieve the goal of environment conservation, until the public has a participatory role in it. Public participatory role is possible only when the public is awared about the ecological and environmental issues.

In short, if we want to manage on planet earth, we would have to make the entire population, environmentally educated. The objectives of environmental awareness should be:

(a) Improving the quality of environment.

(b) Creating an awareness among people on environmental problems and conservation.

(c) Creating such an atmosphere as people find themselves fit enough to participate in decision making process of environmental development programmes.

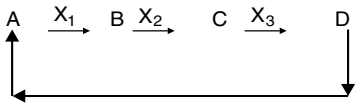
Ecosystem

According to A.G. Tansley (1935), "An ecosystem is the ecological unit consisting of biotic factors (living) and abiotic factors (non-living) in a specific area. For example forest, grassland, desert, aquatic etc.

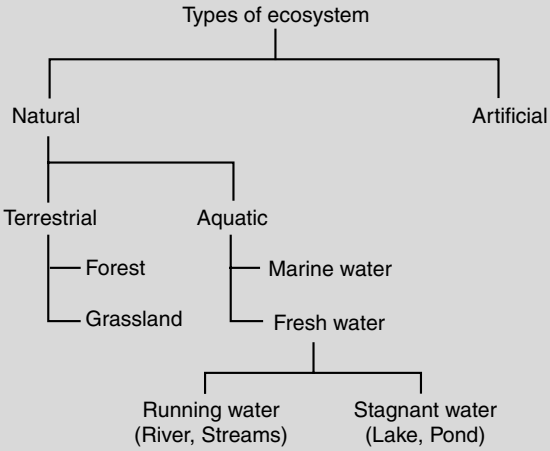
Balanced Ecosystem: All ecosystems, even the ultimate biosphere are open systems. There is necessarily at least an inflow and outflow of energy. Balance of ecosystem means balance of autotrophs and heterotrophs in an ecosystem, to maintain an even distribution of sustainable energy through food chain without any external interference. Any disturbance in autotrophic-heterotrophic balance leads to ecosystem imbalance, more the imbalance more externals are required to balance. Bigger the ecosystems lesser is the imbalance. Balance infact designates to greater primary producers than consumer.

Stability of Ecosystem: An ecosystem which has attained maturity is by and large is a very stable system. It is controlled by feedback mechanic who may be either positive or negative.

A simple feedback mechanism is shown below:



Here A produces B; B produces C and C produces D by the catalysis of X_1, X_2, X_3 respectively and may be a component which is needed in a little amount. When D is produced in large amount it inactivates X_1 and the reaction stops proceeding. Again D gets exhausted, simultaneously accumulation of A starts, resulting in activation of X_1. Many such feedback mechanisms occur in ecosystem to resist change. Their abilities to resist unfavourable changes have been termed as homeostatic mechanisms or, ability to return to a balanced point is homeostasis.



Structure and Function of an Ecosystem

An ecosystem has two types of components–

1. Abiotic
2. Biotic.

1. *Abiotic component includes—*

(A) Physical

(1) Sunlight (for photosynthesis)
(2) Water (essential for living beings)
(3) Temperature (necessary to get survive)
(4) Soil (provide base and nutrients)

(B) Chemical

(1) Proteins
(2) Carbohydrates
(3) Fats
(4) Minerals etc.

2. *Biotic component*

(1) Producers/Autotrophs
(2) Consumer/heterotrophs

3. *Decomposers*

Producers: They are chlorophyll bearing, self nourishing organisms, which prepare organic compounds from inorganic raw materials, through the processes of photosynthesis e.g. all green plants.

Consumers: They depend on the energy, produced by the producer. Different categories of consumer are herbivores, carnivores and omnivores.

Decomposers: They attack on dead animals, producers etc. and convert the complex organic compounds, locked in to them in to, simpler compounds (by the process of decomposition and disintegration) and then recycle all the nutrients back. For example bacteria and fungi.

Function of Ecosystem

1. It balances the rate of biological energy flow.
2. It balances the nutrients cycle.

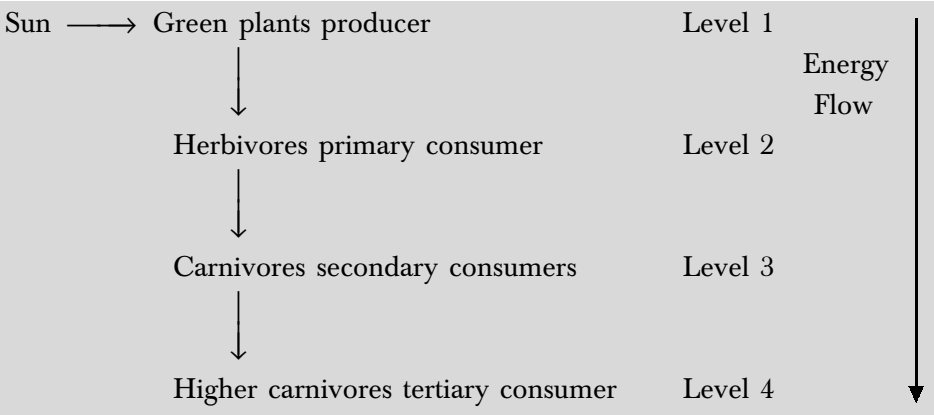
Sun ⟶ Producer ⟶ Consumer (Animals) ⟶ Decomposers (Microorganisms)

Nutrients Cycling

The producers actually use nutrients and prepare food, the consumers consume it and the decomposers recover the nutrients keep flowing between biotic & abiotic components, forming nutrients cycle known as **biogeochemical cycle.**

Food Chain

The process of eating and being eaten by the successive creatures is known to as food chain. In short it is the flow of energy from producer to tertiary consumer.



Types of Food Chain

A. Grazing food chain
B. Parasitic food chain
C. Detritus food chain

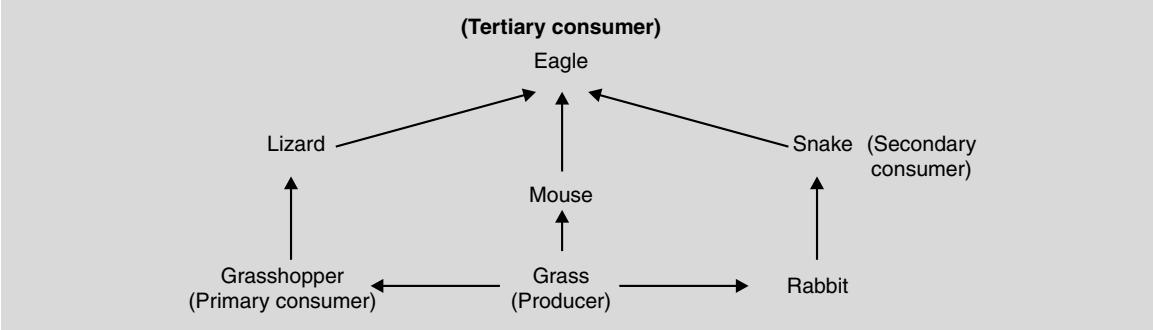
Grazing food chain: It starts from green plants and through carnivores it reaches to the decomposers for final breakdown of the complex in simpler one. For example grassland ecosystem, pond ecosystem etc.

Parasitic food chain: When plants and animals get infected by parasites. Smaller organism consumes them without killing them. For example nematode, bug etc.

Detritus food chain: Food chain that starts from dead and decayed organisms, to the micro-organisms, to the detrivorous or saprovorous and these predator form a chain called detritus food chain.

Food Web

There is a long interlinked chain processes in an ecosystem. Different food chains are interconnected with each other in a specific pattern. A food web presents all possible feeding relationship among various organisms of the ecosystem. If the chain gets disturbed a little, then it leads to the loss of species and the web breaks down.



Sketch diagram of food web

Ecological Succession

The slow but continuous replacement of ecosystem over a period of time in any particular area is called ecological succession.

It occurs due to environmental changes. The colonial establishment and extinction of species fall under this process. Through this way the plants and animal species change gradually.

Types of Succession

1. Primary
2. Secondary

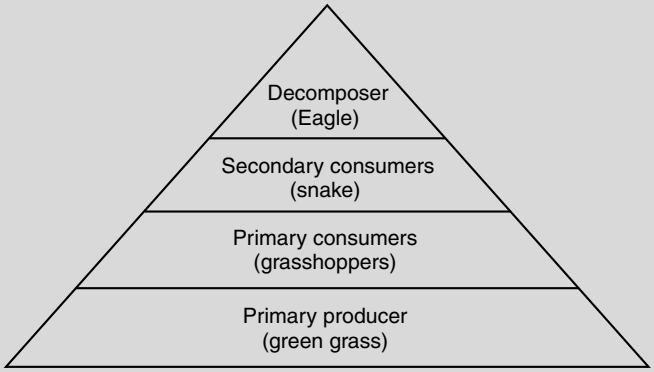
Primary succession: The area which is the lifeless and unexposed to any life is occupied by a living community for the first time is known to as primary succession of that land.

Secondary succession: When a new biotic community replaces an already existing biotic community then this type of replacement is known as secondary succession. For example farm garden or parlous etc.

Ecological Pyramid

It is used to represent the status of the ecosystem for different parameters such as food, energy, and biomass.

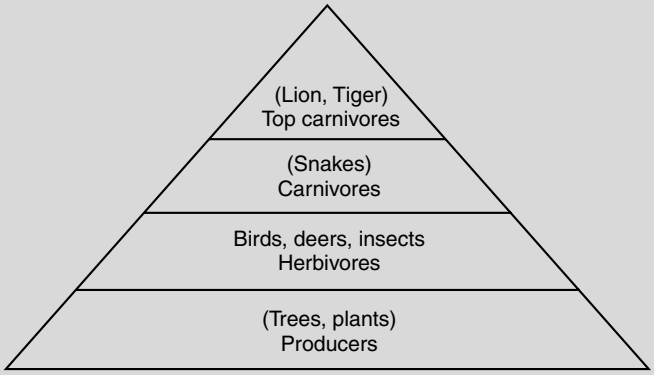
Pyramid of numbers: It represents the number of producers and consumers at each successive tropic level. Its base shows producer, the next level shows the primary and secondary consumers, and the apex higher or tertiary consumers. For example grassland ecosystem.



Pyramid of number

Pyramid of energy: It is based on the total energy present in each tropic level of the pyramid. This energy transfers from base towards the apex of the pyramid. It is always **upright** as energy decreases at successive tropic level from base (producers) to apex (consumers).

Pyramid of biomass: The basis of it is the weight or biomass of the organisms in each tropic level at any time. The biomass decreases from the lower tropic level to the higher for e.g. forest ecosystem.



Pyramid of biomass

Human Activities and their Affects on Environment

(1) *Agriculture*

It is the oldest and widespread occupation of the people in rural areas. Over the years, there have been notable changes in the pattern of farming; Manual farming has been replaced by 'mechanized farming' due to the advancement of different technologies. Ploughing is done by

tractors in place of bulls. Modern agricultural techniques have eventually changed into both ways. Some are favourable and some of these are unfavourable. The changes in the earlier form of agriculture have been brought by the following ways:

(i) Mechanical factors: Tractors, tube wells and agricultural equipments.

(ii) Chemical factors: Fertilizers and pesticides.

The chemical factors have brought a revolution in the agriculture, as they express growth in a very short span of time but their affects in the long run are detrimental.

Affects of Tractors: It is a mechanized means of cultivation. Use of tractors has considerably increased in agriculture these days. It is a multitasked machine which helps in ploughing, leveling, weed controlling and sowing etc.

Fertilizers: Crops require basic food like nutrients for their growth. Fertilizers are used to provide nutrients to plants. It helps in the growth of plants and contributes greatly to increase yields of the crops. Natural fertilizers do not harm the environment.

Artificial Fertilizers: In the form of agricultural practices today artificial fertilizer is used in abundance. They are easy to handle, transport and store and helps in better crop yield. Its increasing use is polluting the environment and contaminating the surface and ground water resources. In the long run, it reduces the fertility of land and also leads to loss of organic matter from the soil. It also affects the lakes, ponds and underground water due to the accumulation of fertilizers in them and the soil.

Pesticide Problem: Pesticides are used to kill pests, it help in killing pests but it is harmful in many respects also.

Advantages

1. Helps in the reduction of crop lose.
2. It controls the probable disease in plants which would cause diseases to human beings.
3. Weeds are controlled.

Disadvantages

1. Non-targeted species are also killed.
2. Some pests are beneficial to the crops; when they are killed fewer new also emerge.
3. Soil fertility is reduced.
4. Food chain and food web are disturbed.
5. It results into many incurable diseases.

(2) *Industries*

Industrial activities generate a huge amount of waste products which are usually discharged into the water bodies. The smoke from industries also pollutes the air. Its noise causes noise pollution too. Processing of wastes from large chemical plant is a very complex process because many chemicals are produced that way. In recent years, emphasis is laid on the industrial waste treatment, for the recovery of useful byproduct. By and large, it should be kept in mind that no industrial product is more important than our environment. Nowadays various measures have been taken to transform industrial waste into profitable products in order to save our environment as well as money. For example waste papers can be used to make thick covers of note books.

Industrialization is considered the synonym to development but it is necessary to review the impact of industrialization on society and environment otherwise it can bring the following consequences:

1. **Ecosystem imbalance:** Industrial plants discharge a number of contaminants to the air and water and thus pollute them equally. Man's uncontrolled actions for the fulfilment of his desires are contaminating the atmosphere and leading the biosphere to undesirable changes that will result into the ecosystem imbalance.
2. **Biodiversity loss:** To set up new industries, the biologically rich habitats are being destroyed and fragmented. Today, biodiversity loss is one of the most concerning crises. A rich biodiversity is essential for the health of biosphere and industrial development of a country.
3. **Toxic metal and non-metal discharge:** Toxic metals and non-metals from the industries, cause great harm to the biosphere. The organic impurities cause harmful affects on the water basins and the regions adjoining them. Discharge of effluents form industries, decreases the amount of DO (dissolve oxygen) in water. It is leading us towards the deficiency of pure drinking water.
4. **Food chain imbalance:** Industrial discharge carries a variety of organic and inorganic contaminants that enters into the food chain and causes imbalance. It disrupts the energy flow of the ecosystem as well.
5. **Disturbance of self purification mechanism:** The organic matter gets oxidized by bacteria which break it into simpler substances such as ammonia, nitrates, sulphates etc. These substances are utilized by protozoa, fish, insects etc. Discharge of organic matter into the streams, results into the growth of bacteria and consequently, it depletes the dissolved oxygen, which is replenished by the atmosphere. This process is called Self-Purification. When large amount of industrial sewage is disposed off into the natural water bodies, the self purification mechanism gets disturbed.
6. **Gaseous emissions:** Natural resources have been exploited at their fullest, in the race of development, all over the world. In recent times, due to industrial coal burning, large amount of gases like CO_2,CH_4, N_2O,CFCs are increasing in the lower atmosphere. The emission of these green house gases results into global warming, at the same times SO_2 and NO_2 emitted from industries cause acid rain and formation of smog.

Control Measures

1. Scientific techniques should be adopted for the reprocessing of the industrial waste.
2. Recycling practices should be made a must in the industrial plants.
3. Reasonable funds should be provided for the construction of treatment plants for industrial effluents.
4. Legal provisions should be enforced by proper administration.
5. Eco-friendly industrial plants should be taken into consideration.

(3) *Mining*

Mining is the Act of extracting ores, coal etc. from the earth. Mining on Industrial scale can produce environmental damages from exploitation and development even long after the mining is closed.

The major effects of mining operations on human being and plants are as follows:

1. Mining produces enormous quantities of waste compared to any other natural resource extraction activity. Water dissolves these wastes to produce contaminated fluid that pollute soil, river and ground water.
2. Mining also leads to air pollution due to release of green house gases and other toxic gases, for example CH_4, CO_2 etc.
3. It leads to deforestation including loss of flora and fauna.
4. Mining operations produce a lot of noise. The deafening sound of machinery used in mining and the blasting create conditions that may become unbearable to local people and the forest wild life.
5. It leads to migration of tribal people from mining areas to other areas in search of land and food.
6. Mining results in lowering of ground water table.
7. Formation of ponds which can alter the hydraulic gradient and drainage basin limits in local regions.

(4) *Transportation*

Way back two centuries, the atmospheric gases were balanced, atmosphere had the capacity to protect itself from the encroaching pollutants. But the various means of transport released oxides of nitrogen, hydrocarbon, and various harmful gases in the atmosphere. The affect, after all was the disturbance in the atmospheric.

Road Transport

Various pollutants that emit from automobiles:

1. **Carbon dioxide (CO_2/CO):** It emits from automobiles. Its concentration during 1990's was 1.5 ppm.

   Carbon monoxide reacts with haemoglobin of the blood to form carboxyhaemoglobin and minimizes the oxygen carrying capacity of blood. The symptoms are headache, fatigue, tiredness, unconsciousness and cardiovascular damage.
2. **Nitrogen oxides (NO_2):** It is toxic at the highest rate, attacks the lungs and it also reduces the oxygen carrying capacity of blood. It causes many diseases like lung cancer and Asthma. It occurs due to the breakdown of the air sacs in the lungs. It harms even the plant lives by reducing plant growth, its productivity and its yield at a high rate.
3. **Hydrocarbons:** It causes lung and skin cancer as it is carcinogenic.

Sea Transport

It consists of ships and submarines etc. that covers the distance between countries. Sometimes, due to storms and icebergs, accidents take place due to which oil spills into the ocean. This floating oil is absorbed and consumed by billions of tiny phytoplankton and other organisms, since these organisms play a vital role in the food chain, and other forms of marine life depend upon them, they, eventually pass this oil to the other organisms as well via food chain.

Air Transport

It is one of the fastest modes of transportation and pollution too. Various pollutants such as CO, CO_2, oxides of nitrogen and oxides of sulphur are spread in the atmosphere through airplanes. Jet planes travel in the stratosphere and disrupt the Ozone layer by emitting pollutions such as SO_4, and Cl_2 etc. Airplanes create supersonic booms which harms people physiologically and psychologically.

Important pre-requisites for controlling vehicular pollutions are:

(*a*) Reduction of lead content in motor fuel.
(*b*) Joining of areas for regulation of traffic movements.
(*c*) Improvement in the processes of automobile technology.
(*d*) Improvement in the traffic system and conditions of roads.
(*e*) Restriction in the growth of urban centers, industries and commercial centers.
(*f*) Implementation of emission norms for new and in use vehicles.
(*g*) Use of unadulterated fuel.
(*h*) Keeping a check on evaporative emission form storage tanks, fuel distribution system and vehicles.
(*i*) Improvement in fuel quality and usage of cleaner fuel.
(*j*) Phasing out of grossly polluting vehicle.
(*k*) Streamlining traffic management.
(*l*) Reformation in public transportation system.

HUMAN ACTIVITIES

1. Resettlement and Rehabilitation of People — Its Problems and Concerns

The industrial and urban development projects such as power plant, oil refineries, fertilizers, chemical industries, river valley projects, dams, reservoirs and mining etc. are the major causes for displacement of people from their well established living places.

For this purpose, the govt. has introduced the land Acquisition Act, 1894, which empowers it to serve notice to the people to vacate their lands if required for the govt. planning. Provision of cash compensation in lieu of the land vacated exists in section 16 of the act.

The United Nations Universal Declaration on Human Right (Article 25 (I)) has declared that right to housing is a basic human right. The involuntary movement of the residents from one place to another for resettlement gives rise to a variety of problems which may be social, economical and of other types. They are as follows:

Social Problems

1. Disturbances in the social structure
2. Breakage of community structures.
3. Dispersal of kith and kins
4. Weakening of traditions.
5. Loss of cultural identity.
6. Inter-relationship and potential for mutual fraternity is diminished.

Economical Problems

1. Income sources are shattered and ruined.
2. Families face long-term hardships.
3. Search of new jobs requires time.

Educational, Psychological and Environmental

a. Education of children gets interrupted.
b. Joint families are separated which affects different members of the family, differently.
c. Resettlement in the newer environment affects the mental and physical skill of the individual.
d. People face greater problems of availing recourses due to competition in the relocated environment.

Rehabilitation Policy: Objectives and Planning

There is a ministry of rehabilitation and resettlement (R and R) in Government of India and state Government to resolve the gravity of the fact of rehabilitation, in case of involuntary displacement. Their losses are compensated by the Ministry. This is ensured by the implementation of the following policies:

1. To provide adequate compensation.
2. To provide social infrastructure and community services.
3. To provide proper rehabilitation and facilities.
4. To help them providing a locality of their preference.
5. To settle them in a community, they are acquired to.
6. To help them improving their living standard.

(2) Effect of Housing on Environment

Housing involves dwellings of living beings in the form of group housing, office buildings, multistoreyed buildings, shopping mals, industrial township etc.

Various sources of pollution generated in housing activities are:

Indoor Sources of Pollutants

(a) Air conditioner provides good temperature for fungal and other bacterial growth.
(b) Fumes generated from kitchen appliances such as gas stove, cooker, heater, blower, oven causes air pollution.

(c) Other appliances such as T.V., radio, fan, cooler etc. cause noise pollution.

(d) Materials used for decoration such as varnishes, paints, coated wall papers etc create air pollution.

Outdoor Sources of Pollutants

(a) Building construction material such as cement, sand, steel, gravel, marbles, aluminium etc cause water and soil pollution.

(b) Shops producing ozone from photocopier machine, tobacco smoke, freon using as solvent in industries causes air pollution.

Solution to the Problem

(a) In the case of indoor pollutants,

(i) The fumes generated from appliances should move outside of the house through chimney.

(ii) The volume of electronic appliances should be up to audible limit.

(iii) The materials used for decoration or protection from mites etc should not reach directly to the water system.

In the case of outdoor pollutants–

(i) Eco-friendly appliances should be in use.

(ii) Construction materials should not find their way to open atmosphere or water system.

(3) Social, Ethical and Aesthetic Issues

It involves some of them as

1. Agriculture
2. Green Revolution
3. Global Warming
4. Ozone depletion
5. Resettlement
6. Economic growth
7. Greenhouse effect
8. Acid rain
9. Wasteland reclamation
10. Rainwater harvesting
11. Watershed management
12. Urbanization
13. Consumerism
14. Industrialization
15. Diseases

Ozone Depletion

Ozone layer acts as a shield scattered in the stratosphere. It absorbs the sun's UV radiation and keeps it away from the earth's surface. Its depletion is a cause of global concern as its thinning will let the lethal UV rays pass and reach to the earth's surface which will result into cancer, eye damage and even will reduce our immunity. Ozone hole is usually measured as reduction in the total column above a point on the earth's surface, which is normally expressed in Dobson units. Substantial reductions up to 70% have been observed in the ozone column over Antarctica.

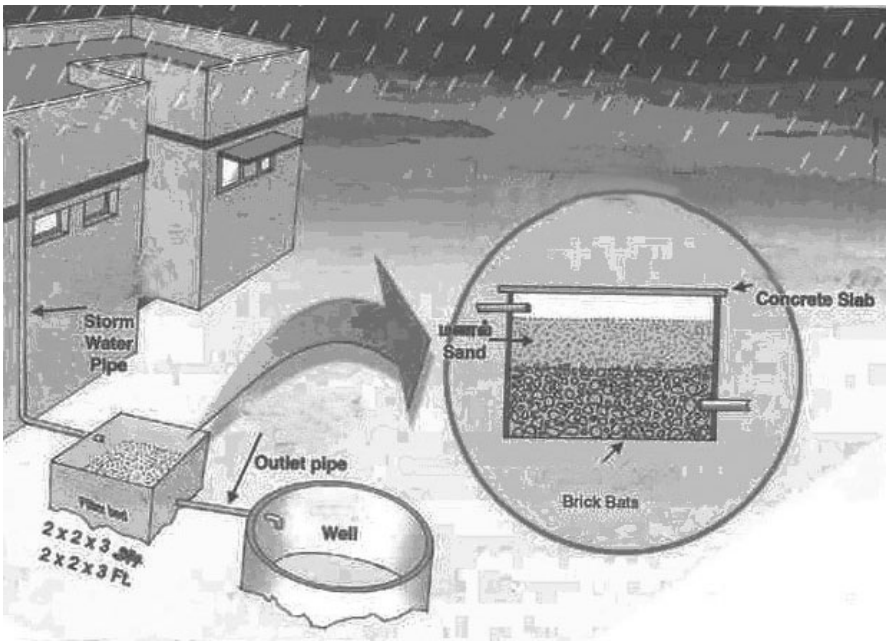
Wasteland Reclamation

The land which is either incapable for agricultural purpose or is not useful to its optimum potential, due to various reasons is marked as wasteland. Usually it is unused and non-productive. India has total land area of about 328 million hectares out of which 24% is a wasteland area. Various measures have been adopted for wasteland reclamation which are as follows:

1. Afforestation
2. Reforestation
3. Protecting soil erosion by providing ground cover.
4. Change in the agricultural practices by adopting mixed cropping and crop rotation etc.
5. Eco-logical succession i.e. natural process of development and re-development of the ecosystem.

Watershed Management

The collection of flood water in any area is referred to as watershed management. Afterwards when the flood water recedes, these areas are used for agricultural purposes, for wildlife habitat and aquifer recharging etc.



Watershed Management

Watershed management can be helpful in the following ways:

1. By applying farming practices at high areas such as mountains, reduces soil loss.
2. Planting the trees retains soil on the earth.
3. It preserves water to recharge the aquifers.

4. To hold the water series of small dams should be made on the streams.
5. Fish breeding can be done in the collected water.

Water Harvesting

It is the method of collecting rain water and conserving it for later use. The water thus stored in tanks etc. is used for household purposes, livestock feeding, agricultural and land use etc.

Rain Water Harvesting

Rain water harvesting in needed to fulfil the

1. Shortage of drinking water in the arid and semi-arid areas.
2. Lack in recharging of groundwater during raining season due to blockage of recharging area due to urbanization and construction of buildings.
3. Demand of water due to growth in population.
4. Rainwater availability at no cost.
5. Lowering of ground water table in those areas where well is dried.
6. Reduce the creaking down of ground surface due to disturbance in soil water equilibrium.

Consumerism

It refers to the consumption of resources by the people. Due to extensive industrialization, consumerism has shown a bouncing rise. Consumerism has arisen due to the increase in population size and due to demand by this population, as our life style is dynamic and changing. In the modern era, our needs have multiplied so consumerism of resources has also increased.

Consumerism aeries with the place and maximum consumerism are found in developed countries. More consumption leads to more waste generation and more waste generation to pollution in the environment.

Diseases

If the environment keeps getting polluted, the health of mankind will also be deteriorated & many diseases will affect and strike. Some of them are:

a. Air borne diseases

- Asthma, cough; due to SO_2
- Defects of nervous system; due to Pb
- Fibrosis, emphysema; due to NO and NO_2
- Bronchitis, respiratory problems; due to suspended particulate matters.

b. Water borne diseases

- Cholera, dysentery, typhoid fever; due to bacterial infections.
- Hepatitis; due to viral infections.
- Amoebic dysentery; due to protozoial infections.

c. Green revolution

The program started to bring revolution in the reservoir of food grain by enormous production of food grain. A brilliant personality named M.S. Swaminathan started the green revolution first, in India.

Human Activities—Food

Anything eaten to satisfy appetite and to meet physiological needs for growth to maintain all body processes and to supply energy to maintain body temperature and providing physical strength to perform activities properly is called, food.

Energy Requirements per hour of the activity:

Activity	Kcal	Activity	Kcal
Writing	20	Cycling	180-600
Dressing	33	Coal mining	320
Ironing	60	Sawing wood	420
Walking	130-240	Walking upstairs	1,000
Polishing	175	Running quickly	1,240

Food and Agriculture Organization (FAO)

- It is the specialized agency of United nations. Its headquarter is in Rome, Italy. Its mission is to raise the standards of nutrition and standards of living to secure

improvement in the efficiency of the production and distribution of all food and agricultural products to better the condition of rural population.

- FAO promotes national and international plans, actions to undertake scientific, technological, social and economic research to improve educations and administration of the food sector, to conserve and sustainability of natural resources.

Food Corporation of India

The food corporation of India was set up under the food corporation act, 1964, in order to fulfil the following objective:

(A) Accurate and effective price support operations for safeguarding the interest of the formers.

(B) Equal distribution of food grains throughout the country for public betterment.

(C) Preparing satisfactory level of operational and buffer stocks of food grains.

Balanced diet: A balanced diet contains a variety of food stuff having sufficient protein, carbohydrate, fats, vitamins and minerals, which can be obtained from cereals, vegetable, oils, fruits etc.

Composition of balanced diet for healthy man:

Food Items	Quantity (in gm)	Energy (in calorie)
A. Cereals (wheat flour)	325	1000-1150(340)
B. Pulses (e.g. Rajma)	100	320-370(345)
C. Mixed Vegetables (Roods, leafy etc.)	150	75-150(97)
D. Fruits (e.g. Banana)	100	50-85 (153)
E. Milk of cow, buffalo and other	100 ml	100-135
F. Sugar	30	120
G. Fish (e.g. hilsa)	100	110-275 (273)
H. Egg (1no.)	40-50	55-85

There are two major food problems in the world:

(1) *Under Nourishment*

An average energy requirement by a healthy man is about 2500 Calories/day, if the intake of calories is less than this then food is said to be under nourished. It affects human beings in following ways:

1. Inefficient energy makes human being unable to perform work properly.
2. Body becomes susceptible to disease lack of proper nutrients.

The affects of under nourishment on children are:

1. Body growth becomes low
2. Various abnormalities arises.
3. Mentally retartedness is seen.
4. Hormonal disorders such as goiter is seen.
5. Delayed adulthood is observed.
6. Physical abnormality generates social inferiority complex.

Malnourishment

Lack of healthy ingredients in diet is called as malnutrition. If the food is being eaten, has nutritional imbalance due to lack of appropriate dietary ingredients, malnutrition may take place which can bring following abnormalities:

(1) Anemia: It is caused due to lack of iron in the diet and/or inability of tissues to absorb iron from the blood.

(2) Goiter and hypothyroidism: It is caused due to deficiency of iodine in the diet.

(3) The deficiency of vitamin such as vitamin A causes Night blindness, vitamin B causes Beri-beri; vitamin C causes Scurvy, vitamin D causes Rickets etc.

Environmental Impact Assessment

It is a formal study process, used to predict the environmental consequences of proposed major developmental project. Such assessment may include those projects which can significantly alter the landscape and consequently disrupts and disturb the services and inhabitant of that place. It also involves manufacturing, handling and use of hazardous materials and those projects which are to be settled nearby urban centers, near ecologically sensitive areas, hill resorts and nearby scientific and cultural heritage area:

Some of the projects are as follows:

(1) Establishment of cement industry

(2) Petroleum industry

(3) Hazardous waste treatment plant

(4) Nuclear power plant

(5) Distillaries

(6) Heavy water projects etc.

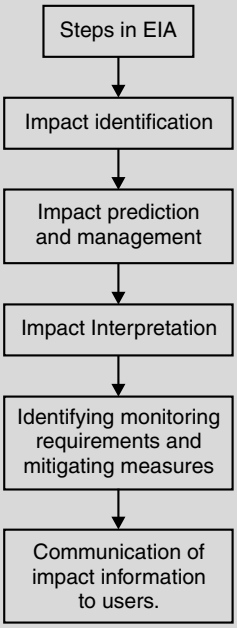
EIA concentrates on problems and conflict of natural resources continuously that could affect the surroundings. It analyses the project thoroughly so that the project may not be harmful to the people, their homeland and their nearly surrounding areas.

The predicted future problems are looked after by it and maximum attentions are paid to minimize it. EIA tries to force the problems and tries to minimize it by making a pre-design.

To achieve the aim of EIA, the statements are sent and being communicated to all the groups of:

(1) the project developer and their investors

(2) the regulators, planners and politicians



Flow Chart of EIA

The project planners and engineer first of all used to read the conclusion of an EIA and then make decision about the project by taking in consideration the benefits of the project and avoiding the problems. The project gets its credit and recognition which yields its benefit without causing serious problem to environment and is likely to be completed on time and within the budget decided to it.

The project developers, their management planners, politicians make decision about the purpose project. After realizing the conclusion by members of the assessing team and finding it beneficial to local people along with their main motive not to harm the existing ecology, they give permission to the owners after having undertakings. So that the aim of sustainable development may be achieved. This project has to be designed to suit the local environment and should be completed on time to avoid any difficulties on the way.

- It is an important face in the process of deciding about the final save of a proposed projects and it helps the official to take decision and achieve aim more successfully.
- Project that yields benefits without causing serious problems is more likely to bring credited and recognition to its proponents.

Essentials of EIA Procedure

(a) EIA should be applied–to all developing project as a primary structure.

(b) EIA should be undertaken–throughout the project with best applicable science & mitigation technology.

(c) EIA should address–cumulative and long term, large scale affects, design, location & technological alternatives.

(d) EIA result in–accurate and appropriate information.

(e) EIA should provide–eco-friendly sound decision & an appropriate follow up process.

In summary we can say that it

(1) Finds way to reduce unacceptable impacts and to shape the project so that it suits the local environment.

(2) Presents the prediction and options to decision makers.

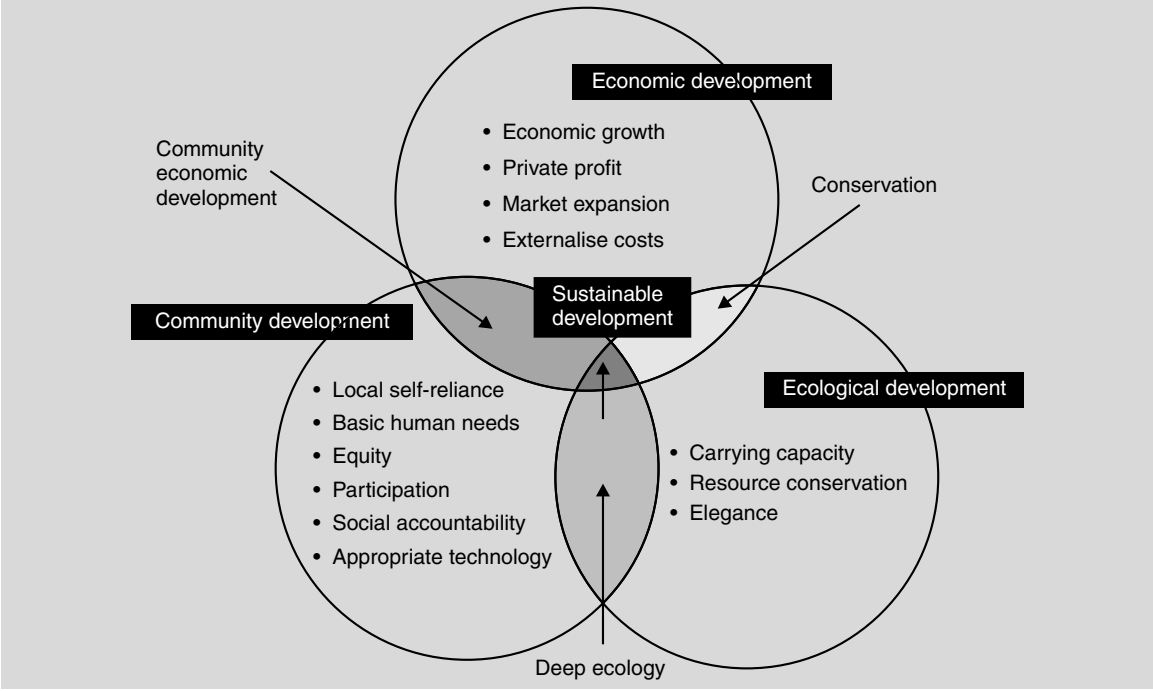
(3) Predicts the likely environmental impacts of project.

Sustainable Development

It is defined as the "Development that meets the needs of the present without compromising the ability of the future generations to meet their own needs."

Development means: Improving people's lives.

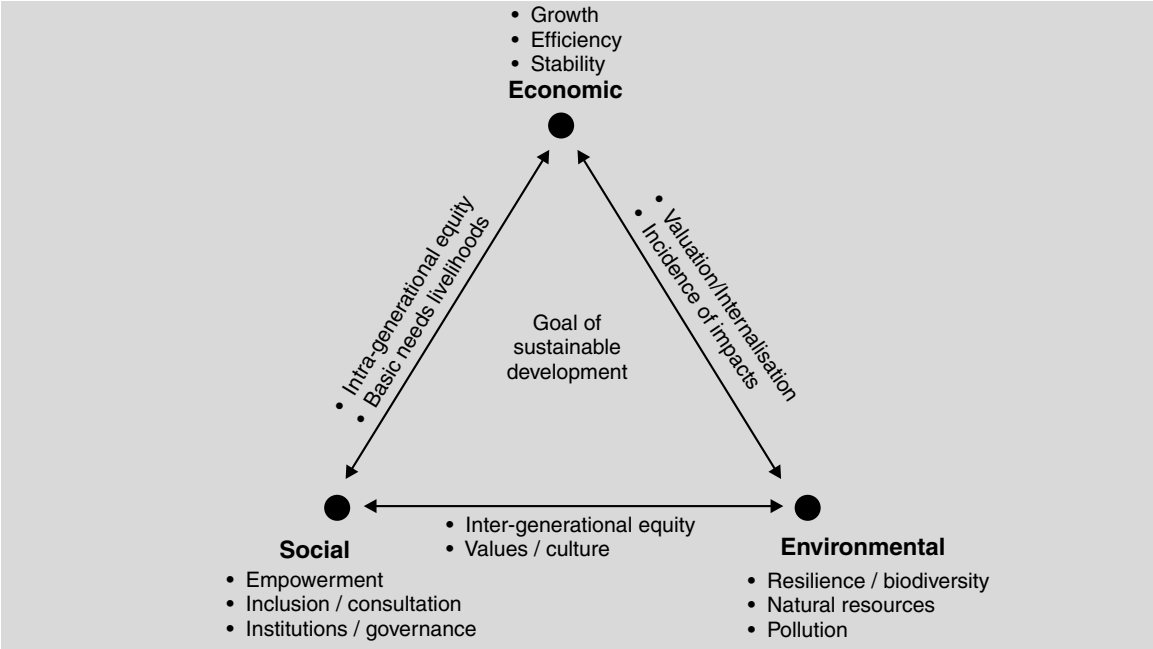
Sustainable development means: Extending progress without exhausting resources.



Important Aspects of Sustainable Development

(1) Environment (2) Society (3) Economy

All the aspects are interlinked and balanced without compromising the ability of present and future generates to meet their needs.



Objectives of Sustainable Development:

(1) To promote equity.

(2) To improve the quality of human life.

(3) Sustainable use of natural resources.

(4) Protecting the Ecosystem.

(5) To fulfil international standards.

(6) Considering environment in decisions.

(7) Long-term planning and implements.

(8) Zero pollutant emissions from the industrial process.

Factors Affecting Sustainable Development:

(1) Excessive exploitation of non-renewable resources.

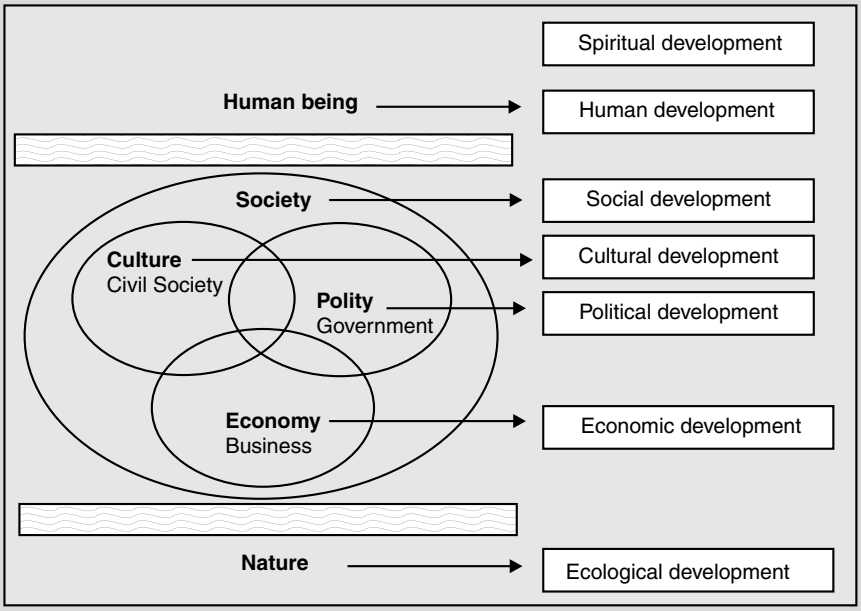
(2) Increasing population growth and population density.

(3) Decreasing gross domestic product per capita.

(4) Uncontrolled consumption of energy and environmental.

(5) Pollution.

(6) Deterioration of land.



Development: A Sketch Diagram

The process has started and some progress has been achieved. Both developed of developing countries have to work together to achieve more progress in these areas. Environment belongs to all of us, so a collective effort is required to achieve its goal.

QUESTIONS

A. Long Answer Questions

1. What is environment? Discuss its scope and importance.
2. What do you understand by balanced ecosystem, how it is different from normal ecosystem?
3. How human activities such as shelter and food affect environment?
4. Define food chain. How food web is different from it?
5. What do you mean by structure of an ecosystem? Explain the various components of an ecosystem.

B. Short Answer Questions

1. Explain the objectives of environmental science.
2. Define the term ecological succession.
3. Define the ecological pyramids.
4. Why public should have environment awareness?

5. Write about environment impact assessment?
6. What are major roles of autotrophs and heterotrophs in the ecosystem?

C. Fill in the Blanks

1. The study of reciprocal relationship between organisms and their environment is called _____.
2. The term ecosystem was given by _____.
3. Bacteria and fungi are treated as _____.
4. The term ecology was coined by _____.
5. The word environment is derived from the French word _____.

D. Match the Following

	COLUMN I	COLUMN II
(i)	Producer	Soil
(ii)	Earnst Hackle	1977
(iii)	Intergovernmental conference on environment education	Green plants
(iv)	Environment (protection) Act	Ecology
(v)	Edaphic	1986

E. Multiple Type Questions

1. The part of atmosphere between troposphere and mesosphere
   a. Mesosphere
   b. Exosphere
   c. Stratosphere.
   d. None of these
2. Global atmospheric temperature is likely to be increased due to
   a. Soil erosion
   b. Water pollution
   c. Noise pollution
   d. Burning of fossile fuels
3. Increasing industrialization is causing much danger to man life by
   a. Providing more job opportunities
   b. Utilizing most lands
   c. Producing more goods
   d. Polluting the environment
4. Environmental education should be imparted only at
   a. Secondary school level
   b. All stages
   c. College stage
   d. Primary school age
5. World environment day is celebrated on
   a. 5 June
   b. 16 September
   c. 14 November
   d. 1 December

F. State True of False

1. Energy is recycled in an ecosystem. T/F
2. Environment education is essential for research work. T/F

ANSWERS

(C) (i) Ecology, (ii) A.G.Tansley, (iii) Decomposers, (iv) Ernst Hackel, (v) 'Environ'

(D) (i) Green plants, (ii) Ecology, (iii) 1977, (iv) 1986, (v) Soil

(E) (i) c, (ii) d, (iii) d, (iv) b, (5) a

(F) (1) False, (2) False

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