

Original Article

Living Organisms and Environment Interrelationship

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Abstract

Our earth planet have a large area occupied by the different things like soil, ocean and space. Oearth planet contains biotic and abiotic factors . Abiotic factors like edaphic facto ,climatic factor ie soil, light,temperature etc.Biotic factors are producers , consumers and decomposers. Producers are all green plants, . Consumers are herbivores, carnivores and omnivores animals. Decomposers are all microorganisms and Along with the farming, man has domesticated a variety of animals like cows, buffaloes, sheep, goat for his benefits. Because of these animals, the problem of overgrazing. has resulted in the destruction of forests, grasslands, disappearance of more palatable plants species etc. In such localities, some unpalatable, annuals, weeds, shrubs start to grow and turn the whole area into man-made desert. Use of mechanical devices for farming, fertilizers, pesticides, hybrid varieties of crops resulted into green revolutions. It did increase crop yields two times or three times in many tropical countries. However, this green revolution has given rise to certain ecological problems. Excessive use of water for irrigation has changed fertile land into saline and marshy land which ultimately pesticides also resulted into soil, water and air pollution.

Keywords: Farming, Animals, Forest, Grassland, Pollution etc.

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INTRODUCTION:

All living organisms and environmental factors are interacting with each other. Living organisms are depend on environmental factors for their habitat ,growth and reproduction. The early human being was a nomad. He spent a major portion of his time in search of food. He was close to nature because his existence depended directly on plants and animals. He, then made the leap from hunting and food gathering to farming and creating conditions of living in small village communities. He tried to replace the natural biological communities to suit his requirements. He cut down a number of forest trees, shrubs and grasslands. These man made open places formed new biological communities. He developed agriculture in these places and in due course of time, these were turned into fields, road etc. in terms of human actions. Man is all the while replacing the various vegetations by new ones which he fields to be more suitable, useful and profitable, in the changing environments. He has also succeeded in changing the natural water relations and sources by way of irrigation and by building up huge dams like Bhakra Nangal, Kpyana etc.


MATERIAL AND METHOD:

The industrial revolution has changed the face of the whole world. Man has put more machines

for more production. With increase in production, the cost of production has came down. But the heavy industrialization and urbanization posed a serious problem of environmental pollution. Government policy was to give permission for more and more industries to help national development. Industrialization has no doubt provided job opportunities to many, but at the same time created pollution problems. Industrial revolution, scientific explosion, urbanization, modernization styles, population bomb, and technological race are the root causes of environmental pollution. Pollution may be defined as an undesirable change in the physical, chemical or biological characteristics of air, water and land that may or will harmfully affect human and other life. Pollution can be natural or man made. The agents that pollute are called pollutants. They are of various kinds.

RESULT AND DISCUSSION:

Living organisms specially humanbeing is a factor which causes destruction to environment and it leads to pollution. It is just for more benefit and due to illiteracy. Air pollution is one of the major problems created by the modern man. It is estimated that about 100 million tones of wastes are poured in to our atmosphere each year.

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The air pollutants in the form of smoke from industry, power plants, automobiles and homes and burning of fossil fuels also spread pollution into our environment. The burning of coal, wood, diesel oil, kerosene, petrol etc. produce five categories of pollutants viz. Carbon monoxide ii) Hydrocarbons iii) particulates iv). Sulphur dioxide v) nitrogen oxides

Acid rain is a side effect of air pollution. Sulphur dioxide and nitrogen oxides react with water in the atmosphere, to form sulphuric acid and nitric acids that reach the earth along with rain water as acid rain. It directly damages vegetation and causes injury to men and animals. Thousands of hectare of forest land has been deteriorated due to acid rains. Carbon particles and carbon dioxide would affect weather. A rise in the earth surface temperature, both land and water, due to what is called the green house effect is produced. A rise of global temperature by more than two or three degrees may lead to the melting of glaciers and polar ice caps, flooding of low-lying coastal plains, increase in the flow of rivers, change in rainfall pattern and possible submersion of islands. Nitrogen oxides play an important role in ozone destruction, so that, ultraviolet radiations will reach its maximum.

Science mid fifties, economic growth and development have vastly improved the living standards and quality of life. In most parts of the world. This improvement is largely due to application of advanced technologies in different fields. Technological growth, however, has also produced a new set of problems concerning environmental stress mainly due to industrial effluents and emissions, use of chemicals, fertilizers, insecticides, pesticides, in agriculture, clearing of forests, converting cultivable land into a maze of cement concrete roads, buildings and embankments, noise and radioactive rays added to the atmosphere. It has lead to the all round pollution of the environment.

Pollution of fresh water is one of the most serious environmental problems of today's, world. In our country, most of the rivers and lakes are polluted and their waters are unfit for drinking. Sewage and garbage, industrial effluents, pesticides, fertilizers, water used in thermal and power plants, acid water from mines, soaps, detergents are responsible for water pollution. Mercury, especially is a heavy metal that builds up in the food chain. Mercury poisoning, due to consumption of mercury poisoned fish in Japan from Minimata Bay, caused several abnormalities like deafness, blurring of vision, clumsiness, mental disorders in humans etc. Eutrophication is a natural process; but addition of nutrients intensifies eutrophication and is considered to be harmful to fish and other aquatic life. Soil pollution and degradation also results in alteration of environment and the technologies we use, cross national boundaries. Many of them cause global risks. Toxic pollutants produced by one country are harmful to other countries also. The acidification of environment and green house effect etc. are the threats to life support system. Political and technological ambitions have led to

dangerous arms race. Even the production and testing of armaments affects the environment. The missiles, air craft space rockets etc. leave burnt fuel in the upper atmosphere. Which adversely affects the ozone layer. A nuclear war can cause so much destruction to the atmosphere the earth and the oceans, that they cannot probably, recover their original state. Industries, also pose danger, of industrial accidents. Bhopal disasters and the Population explosion is another threat to the environment. The remarkable fact is that much of this has taken place in the poorer and under developed countries in Asia. Africa and Latin America. There is a high correlation between rate of population, poverty and lack of education. Over population puts strain on the resources of the world, including the environmental resource. The resources of the world, including the environmental resource. The resources like coal, iron, petroleum, copper etc. are available in limited supply and are likely to be exhausted within a limited number of years. There is already a world crisis of energy due to over population. Larger population requires more and more production of food requiring more land. There is a tremendous strain on the resources of drinking water. Thus, overpopulation creates a number of problems to environment. Now growing number of people are becoming aware of the critical state of our environment. It is hoped that use of modern technology and educating people would take us towards preservation and improvement of the environment.

Man is a dominant organism of most ecosystems. He controls and modifies environments more extensively than any other organism. In fact, man is changing natural environment due to his intervention and attempt to become master of the planet earth. Several man-made activities such as, colonization, urbanization, industrialization, mechanised agriculture, mining, transportation and technology have seriously affected the natural environment. Deforestation provided land for agriculture and rural inhabitation. The rural land has been converted into urban settlements and open spaces are fast vanishing. The mass scale destruction of flora and fauna has become detrimental to ecological balance. Many environments throughout the world have been rendered barren and made unfit for survival of organisms. Under the name of economic development man has been altering the environment. Because of his numerous ecological resources like air, water space, minerals, vegetation, wild life etc. the modern civilization has to face many serious ecological problems. Man has already started facing problems such as energy crisis, pollution, land use, flooding, erosion, population growth urbanization etc. today, it is quite clear that these man-made activities have disturbed ecological balance of biosphere. There is, therefore, need to identify the areas and causes of the degradation of environment and their consequences that have occurred over the years, so as to take steps to preserve the heritage of mankind and live in harmony with the environment. Effect on land : Land is the basic resource for us. It is

the living ground or habitat for all terrestrial plants and animals. Land is under great pressure due to increase in population. Land soil face several problems like pollution, deforestation, erosion flooding, water logging, salination and ill-planned urban encroachment. Soil erosion is caused by water, wind, ocean, waves, glaciers, cutting of trees, over-grazing, over cropping and improper tilling. Floods are caused by soil erosion and soil erosion, in turn, causes floods. The pesticides, fertilizers, industrial wastes, heavy metals, etc. are the main soil pollutants which adversely affect the structure, fertility, productivity and the quality of land. Over irrigation is also responsible for salination of soil. Intensive farming with poor drainage is causing serious salination damage in large areas of India.

Normally, air has a constant percentage of different gases in it. Oxygen is the most essential element for the survival of any organisms. However, due to some natural processes or human activities, undesirable changes occur in air causing harmful effects on man and other species. It is estimated that every year about hundred million tons of gaseous and particulate pollutants are dumped in our environment. Automobiles, industries, domestic combustion, ionizing radiations, pesticides are the main air pollutants. Several pollutants like dust, smoke, carbon monoxide, sulphur dioxide, nitrogen oxides, hydrocarbons, biological agents pollute the air. Photochemical smog is a secondary pollutant formed by reaction between nitrogen oxide and hydrocarbons in the presence of sunlight. Nitrogen dioxide, ozone and a compound called PAN (peroxylacetyl nitrite) appear as a yellowish brown haze in photochemical smog. Ozone forms a protective layer in stratosphere, but in air it affects respiratory and nervous system. The photochemical smog is harmful to timber. PAN is especially damaging to the plants. The acids when precipitated as rain or snow create acid rain. It causes direct damage to the leaves of plants. Forests in many parts of the industrialized world are drying because of acid rain. Acid also corrodes materials such as marble stonework and metals.

Effects of temperature: it is now known that air pollution, both due to carbon particles or soot and carbon dioxide affects weather, of important habitats. This has also a profound effect on species, diversity of plants and animals. Many species of plants and animals have become extinct and many more are on the verge of extinction. This is because of over-exploitation of wild life. Many species of aquatic animals are falling total extinction as they are caught by mechanical devices for sea food industry. A large scale destruction of wild life for food, safety and pleasure started with the use of fire as a means of hunting. It is believed that man made forest fires have caused the extinction of several species in the past.. The species which are in danger of extinction are called endangered species. Musk deer, rhinoceros, wild buffalo, peacock, giant squirrel and many other animals are the endangered species. In nature, predators survive on their preys and hence food chain and food web phenomena exists in any ecosystem.

But man has disturbed these things. For example, killing of herbivore animals from their natural habitat resulted into attack of lions and tiger on human beings and his domesticated animals. The killing of snakes for their skin allows the rat population to increase enormously. Same thing applies to insect pest populations. Destruction of insect enemies such as birds, frogs and snakes resulted into overpopulation of harmful insects.

Bioaccumulation: Hazardous chemicals such as pesticides and heavy metals in soil and water, often accumulate in the bodies of organisms including man, because they are not excreted. Once they enter the food chain, they become more concentrated at each level. It can persist in the environment for as long as fifteen years. It enters birds through the organisms they feed on, which in turn get it from the organisms lower in the food chain. When a high concentration builds up in birds, their reproductive systems are affected. As a result, they lay fragile eggs that easily break in the nests. Once it enters the food chain of aquatic ecosystem, its concentration goes on increasing at each level, for example, from plants – large fish-human beings. In countries like Japan which depend largely on fish and other sea food. There is a distinct danger of mercury poisoning resulting from the industrial discharge into the sea. Bay that had been contaminated with methyl mercury developed numbness of the limbs, lips and tongue and lost muscle control. Deafness, blurring of vision, clumsiness apathy and mental derangement also occurred. This incidence was known by name Minamata Disease. Settlements are responsible for water pollution. Besides these, agro-chemicals, nuclear and thermal power stations, ferries, acid water to from mines also contribute water pollution. Domestic and municipal waste water is rich in organic nutrients. If this kind of water is made free from disease carrying germs and poisonous elements, it can be used for irrigation of farms, gardens and other vegetations. Industrial effluents are rich in inorganic and organic pollutants. They can be suitably treated to eliminate the pollutants. These involve neutralization of acids and alkalis', removal of toxic chemicals, coagulation of colloidal impurities, precipitation of metallic compounds and reducing the temperature of waste waters to decrease thermal pollution.

Sewage treatment is usually performed in the following three stages.

Processes : The waste water or sewage is treated in a tank or in ponds for several days. In doing so, the heavy large suspended particles settle down to the bottom by themselves, while the finer particles are made to settle down by adding alum and caustic soda. The settled material is called sludge which is used as valuable fertilizer.

In this treatment, aeration is supplied to promote bacterial decomposition of organic compounds into harmless substances like, sulphate and water. This helps in purification of waste water. During later stages of secondary treatment, whole waste water is chlorinated to eliminate the bacteria.

Chlorination kills all harmful germs and makes water usable.

This treatment removes nitrates and phosphates from water. The treated water is then released. Sewage treatment is quite expensive and only first two steps are followed in many developing countries. Growing of algae or water hyacinth, a wild plant that grows in floating masses in rivers, lakes etc. serves double purpose. It cleans pollutants like phosphates, nitrates and heavy metals and these plants can also be utilized for the production of biogas.

Land is the most precious resource, because its produce supports human population and other living beings on land. India is a predominantly agricultural country and nearly 44 percent of land in India is used for agricultural purpose. The remaining few percent is used for various other purposes such as housing, agro-forestry, establishment of industries, development of roads and reservation etc.

Soil erosion causes a great harm to productivity of our land, because in this process, soil is broken up and washed away by water or swept away by wind. A large number of our industries also depend on agriculture. A survey of the present status of land in India has shown that most of our crop lands, Woodlands and grasslands have already become deteriorated owing to faulty agricultural practices. Soil erosion, deforestation, water logging salination and urban encroachment have considerably affected our productive lands. The man-land ratio is very low in India. Due to high population pressure, the per capita available land in our country is only 0.48 hectares. We must learn to survive with this serious limitation. This requires understanding, planning and management of land.

Degradation of land : There are several factors responsible for land degradation. They are as follows : Soil pollution occurs due to dumping and disposal of wasters, application of agro-chemicals. The soil pollutants include pesticides, fertilizers, industrial wastes, salts, heavy metals, excretory products of people and livestock. Increase in the concentration of soluble salts adversely affect the soil productivity and degrades the quality of land. Salts dissolved in irrigation water accumulate on the soil surface. Additionally, salts dissolved in irrigation water accumulate on the soil surface. Additionally, salts from the lower layers move up by capillary action during summer season and deposited as white crusts on the surface. Intensive farming with poor drainage is causing serious salination damage is large areas of India. Soil erosion occurs by water, wind, ocean waves and glaciers. Human activities such as felling of trees, over grazing, over cropping and improper tilling accelerate soil erosion. This consists of cutting down and trees and setting them on fire and raising crops on the resulting ash. It is also called jhuming in north-eastern India. This is unhealthy method of cultivation which degrades forest and disturbs soil stability. It results because of erosion of top soil, shifting of sand dunes by wind and overgrazing in lands sparsely covered by grass. Land degradation can be controlled as follows :

Precautions for soil erosion: It is attempted through restoring forest and grass cover to check erosion and floods. Construction of drainage system can prevent free, uncontrolled flow of water and control deep soil erosion. Formation of a board wall of stone along coasts is also effective in controlling erosion by sea waves and currents.

In the mountain and hilly areas, planting of stems and braches of self propagating trees and shrubs, not only strengthens the slope of the terrace but also provides fuel wood and fodder to the farmers. Alternation of beds of crops with strips of erosion resistant vegetation like grasses, shrubs, trees, maize, sugarcane, cotton etc. brings about stabilization of terraced fields on mountainous and hilly areas.

The most effective step in controlling erosion and mass movement, such as land slides in the hills, is the construction of a network of the drainage ditches which are filled with fragments of stones or bricks so that water flows out through them. Netting is another method to check the erosion which holds the soil material together and adds nutrients.

Farming practices: Shifting cultivation can be replaced by crop rotation, mixed cropping or developing plantation crops which would improve soil fertility and support large population.

Organic fertilizers: No doubt chemical fertilizers like urea, superphosphates, NPK mixtures are important for increasing yield, but their overuse causes the problem of soil pollution. Soil micro flora is lost due to these chemicals. Therefore, cow dung, poultry excreta, compost manure and bio fertilizers like algae, azotobactor should be increase the fertility of soil. Use of pesticides for crop protection should be minimized to avoid soil pollution.

Crops rotation: Due to overuse without rest, soil becomes deficient in the requisite nutrients and loses its fertility. Rotation of crops and vegetables, such as peas and beans, helps to remove the deficiency of nutrients. Plants such as peas add nitrogen to the soil and thus increase its binding property as well as productivity. The roots and off shoots of the crops and their remains are left in the field for a certain period of time to protect the soil from erosion.

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Conflicts of interest

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