

Foundation Course

Semester 3

THREATS TO THE ENVIRONMENT

INTRODUCTION

Atmosphere, water and soil are the most important components of environment in which we live. Atmospheric factors like rainfall, humidity, temperature, sunlight, etc. have a profound effect on living of various organisms. Proper environmental conditions are essential for survival of life on the Earth. In recent years with the development of science and technology, industrialization, urbanization, development of transport & communication factors of environment are getting adversely affected and have created threat of destruction of environment. Thus human activities are considered as serious threats arising from environmental degradation. Number of plants and animals are getting extinct because of loss of their habitat by increasing population and generation of pollutants in the environment. Some scientists have estimated that 50 % of presently existing species of various plants and animals may become extinct by 2100.

THREAT TO ENVIRONMENT FROM EXTINCTION OF SPECIES

The major threat to environment in the next century is mass extinction of plants and animals; Rapid disappearance of number of species is considered as one of the earth's environmental worries, which is more serious problem than pollution, global warming and depletion of ozone layer. Many biologists believe that the rate at which mass extinction is going on, 20 % of the living species are likely to disappear within thirty years by human activities such as deforestation and loss of habitat for animals. Extinction :

In ecology & biology extinction is end of organism or group of organisms normally a species. As species becomes extinct when the last extinct member dies.

Today man has made tremendous progress in his standard of living, health, education, security and availability of quantity of food, comfort mobility, recreation & sports. But ill effects of these developments are often not seen because they happen slowly, unnoticeable and invisibly. Some of the threats to the Environment are as follows :

Threats to atmosphere and water cycle are climatic changes, rise in sea level, atmospheric pollution. Threats to land and soil: soil erosion, species diversity and over exploitation of water. Threat to human : health, food, water, shelter, recreation etc.

HABITAT DESTRUCTION

Habitat loss is the process by which natural habitat is damaged or destroyed to such an extent that it is no longer capable of supporting species and ecological communities which naturally occur there.

Habitat loss in Terrestrial Ecosystem is because of following factors.

Human Activities :

Habitat loss may be directly by human activities which involve clearing of forest land for activities such as agriculture, mining, construction of dams for irrigation and hydro-electric power and urbanization and indirectly by certain human activities which are responsible for air and water pollution, climate change and introduction of invasive species.

Natural factors :

Habitat loss also occurs because of some natural factors such as earthquakes, volcanic eruptions, flood and fluctuations in the climatic condition. Rapid growth of population :

Habitat loss is increasing day by day with rapidly growing human population. As population increases man uses more land for agriculture & settlements which leads to encroachment on neighbouring forest and habitat loss of birds & animals. Habitat Loss in Aquatic Ecosystem :

Coastal Development:

With the development of tourism facilities causeways, construction of jetty there is a direct loss of marine habitat. The habitats most affected are salt marsh and mangroves. In addition to this development of ports, dredging and dumping etc are responsible for habitat loss in coastal areas.

Impact on Mangroves:

Mangroves are important habitat and food source for number of aquatic species. Today, mangroves are threatened for fire-wood being converted into shrimp farms and reclaimed for housing, development of industries.

Pollution:

Most of coastal coral reefs have degraded severely due to runoff pollution, water from the from the land.

Oil spills: Oil from off shore drilling storage tankers, pipeline, ships etc flow from the surface where it harms to species living within its reach.

Impact of Habitat Loss:

a) Habitat loss and human population:

The destruction of tropical rain forest is responsible to reduce the earth's ability by to produce oxygen and consume carbon dioxide. Thus there is increase of carbon dioxide levels which is one of the important factor responsible for global climate change.

b) Due to destruction of habitat of birds & animals:

Aesthetic uses such as birds watching. Recreational uses like hunting, eco tourism etc are declining.

Habitat destruction has altered carbon, sulphur and nitrogen cycle which has increased the frequency and severity of acid rain and killing of fish in lakes & rivers. Effect on rural population: All over the world poor people suffer worst when natural habitat gets destroyed as it results in availability of less natural habitat and less means of natural recourses per capita.

The greatest threat to organisms and bio-diversity is the process of habitat loss . Today large number of bird species and animals species are significantly threatened by habitat loss.

Protection of Habitat :

To protect habitat of many plants, birds & animals government bodies at local, national & international level need to emphasize the following. Protecting remaining encroachment. Natural habitats from human Educating people about importance of natural habitat and bio-diversity. Implementing family planning programmes in areas where there is rapid growth of population. Developing technology to increase agricultural production than simply increasing fatal land under agriculture.

DEGRADATION OF ENVIRONMENT

Degradation of environment is the deterioration of environment through depletion of resources such as air, water and soil, the destruction if ecosystems and extinction of wild life.

The degradation of environment is defined as any change or disturbance to the environment perceived to be undesirable.

The United Nations International strategy for Disaster Reduction defined environmental degradation as “the reduction of the capacity of the environment to meet social and ecological objectives and needs”

Degradation of environment is basically because of pollution and climate change.

POLLUTION

Water pollution and Air pollution is mainly responsibility for degradation of environment.

Water Pollution

One major component of degradation of environment is the depletion of the resources of fresh water on the Earth. Of the 6 billion people on the Earth, some 1.2 billion people lack access of safe drinking water because:

Poisonous Rainwater: Water collected from rain has become poisonous particular in areas of high population densities and industry. Its nutrient components of nitrites, nitrates, sulphur dioxide and sulphates have become poisonous to humans.

Poisonous Groundwater: Particularly in highly productive farming areas, where productivity is achieved by generous applications of fertilizers and agrichemicals for pest control, ground water, aquifers and rivers are becoming more and more polluted. It becomes more difficult to find drinking water.

Salinated Water: In coastal areas, as aquifers become overexploits and their levels drop, it allows seawater to penetrate and to take its place.

Safe Water: More than a billion to not have access to safe water, and their numbers are increasing. Water is unsafe for drinking, when mixed with surface run-off, human or animal excrement or when it is too muddy.

Air Pollution

In the 20th century, air pollution killed 25-40 million people, roughly equal to the combined kill of World War 1 and 2.

Ultraviolet Radiation: Due to industrial gases like CFCs, the protective ozone layer has thinned, it causes more skin cancer.

Air Rain: Most old buildings were built with limestone, cemented together with limestone cement. Acid rains of sulphuric acid and nitric acid dissolve both stone and mortar, resulting in irreparable damage.

Energy: The burning of fossil fuels in power plants and industries causes major pollution to the atmosphere, causing acidification of lakes and dying forests.

Transportation: The major sources of air pollutions are transportation engines. The combustion of fuels in automobiles products number of primary air pollutions: nitrogen oxides, gaseous hydrocarbons and carbon monoxide, as well as, large quantities of particulates chiefly led.

A recently discovered result of air pollution on increasing “hole” in the ozone layer in the atmosphere above Antarctica, coupled with growing evidence of global ozone depletion. This

can increase the amount of ultraviolet radiation reaching the earth, which could damage crops and plants and can lead to skin cancer and cataracts.

CLIMATE CHANGE

The recent phenomenon of global warming is also considered to be a major factor of degradation of environment.

1. Climate change and Temperature :

Climate change affects the Earth's water supply in large number of ways. It is predicted that the mean global temperature will rise in coming years due to a number of forces affecting the climate. The amount of CO₂ will rise. Both of these will influence water resources, since evaporation strongly depends on temperature and moisture availability.

- **Snow Season:** Temperature increase can decrease the length of the snow season in winter and increase the intensity of snowmelt in warmer season, leading to peak runoff of snow melt earlier in the season, affecting soil moisture, flood and drought risk etc. **Thermal Expansion of Water:** Thermal expansion of water and increased melting of oceanic of oceanic glacier melt from increase in temperature gives way to a rise in sea level. **Impact on Ecosystem :** Increase in water temperature can also affect ecosystems greatly because of a species sensitivity to temperature and also in inducing changes in a body of waters self purification from decreased amount of dissolved oxygen in the water due to rise in temperature.

2. Climate Change and Precipitation:

While most of the attention about climate change is directed towards global warming and greenhouse effect, some of the most severe effects of climate change are likely to be from changes in precipitation, evapotranspiration, runoff, and soil moisture.

It is generally expected that, on average, global precipitation will increase, with some areas receiving increases in precipitation and some decrease.

3. Floods and Droughts:

Changes in precipitation affect the timing and magnitude of floods and droughts, shift in runoff processes, and alter groundwater rates.

4. Changes in Vegetation Pattern:

Vegetation patterns and growth rates will be directly affected by the shift precipitation amount and distribution. It will also affect agriculture as well as natural ecosystems.

5. Monster Rains:

Rainfall has become heavier almost everywhere in the world. In some areas a single rain may drop up to two times of rainfall in a single day. Such monster rains destroy lowland infrastructure, while killing tens of thousands of people. For example, Bangladesh in 1991, Hurricane Andrew 1992 Cyclone Mitch 1998, Cloudburst in Mumbai in 2004 etc.