MODULE 2: Land: Use and Abuse

i. Land use: Impact of land – use on environmental quality

ii. Land degradation

iii. Control of land degradation

iv. Wasteland

v. Wetlands

Land

Land is a very important part of lithosphere which comes under the category of limited natural resource. Land supports the life on earth as it provides us with water, shelter and all necessary nutrients along with the food and fruits for us and animals. At present, this natural gift is under threat from human activities which have polluted the land.

Land Uses

Almost all human activities and natural activities requires space which is provided as land surface. Various uses of land are summarized as given below.

1. Providing shelter for living beings.

2. Getting food production by carrying out different agricultural activities on it.

3. Residential purposes to build different types of domestic building and commercial purposes for building commercial centers.

4. To install different types of industries for the progress and development of country.

Land Uses

5. Forestation purposes which provide shelter and food for animals, birds and other living beings.

6. Developing transport means i.e., for construction of roads, railway lines, airport, etc.

7. Construction of irrigation structures and generation of power by constructing thermal power stations and hydro power stations.

8. Disposal of solid and liquid wastes.

Land Degradation

The deterioration in the quality of land and reduction in its fertility is called land degradation. The different factors causing land degradation are as given below.

1. Soil pollution: Top layer of soil is responsible for productivity of land and therefore discharge of different types of pollutants on land alters the physical, chemical and biological characteristics of soil which is called soil pollution.

2. Soil erosion:

The quality of soil is also affected by its erosion through floods, landslides, illegal soil transport, heavy vehicles, and deforestation.

Land Degradation

3. Desertification and Salination:

Desertification is the process in which the productive land converts into desert. Dust and sand storms, grazing of livestock, erosion of top fertile soil, deforestation and excessive lowering of water table may cause desertification of soil. In the salination process, the productive land is converted into the salty soil by the presence of excess amount of salts like sodium and chlorides. Water logging, intrusion of sea water, leaching of minerals and poor drainage of irrigational and flood water may cause the salination of land.

Land Degradation

4. Shifting Cultivation:

It is defined as shifting of growing crops from the current cultivated areas because of reduction in fertility and production. In this method, new cultivated sites are searched and are used till they become less fertile.

5. Urbanisation:

Due to urbanization people are moving from the villages to cities and town areas and therefore the productive areas in such places are continuously reducing because of different developmental activities.

Control of Land Degradation

Following ways can control Land degradation

1. Restoration of forests and grass cover can help in prevention of soil erosion and floods.
2. By replacing shifting cultivation with crop rotation, mixed cropping or plantation cropping. Providing adequate drainage to irrigated and flood-prone lands can prevent salinity.
3. Desertification can be controlled by spread of appropriate plant species and by raising trees as wind breaks.

Land Pollution

Following are the different sources of land pollution:

1. Domestic and Industrial wastes:

Both solid and liquid wastes from house as well as industries are dumped on to the land which contains organic and inorganic substances, solid wastes, plastic bags, acids, alkali, heavy metals and toxic chemicals.

2. Fertilisers and Pesticides:

Now a days different types of chemical fertilisers are used to increase the productivity of crops which degrades the quality of soil. Number of chemicals like pesticides, germicides, insecticides and rodenticides are also used to protect the crops against the attacks of pests and insects. These pesticides also reduce the fertility of soil and adversely affects the microbes. Some of the pesticides like DDT absorbed by the plants remain for a long time and may travel through food chains and food webs.

Land Pollution

3. Unused Solid Materials:

Large amount of discarded materials used in day to day life of human activities are disposed on land which includes concrete, asphalt, paper and rags, leather, plastics, cans, glass and other packing materials.

4. Special wastes:

Radioactive wastes and nuclear wastes from reactor accidents and nuclear explosions also reaches finally into the land. Many water pollutants and air pollutants falling through acid rains also become a part of land.

Control of Land Pollution

Following are the measures required to be taken to control the land pollution:

1. Solid waste disposal should be managed properly and dumping should not be done in open spaces. Sanitary land filling and methods like composting must be used for disposal of solid waste.
2. Excessive use of chemical fertilisers and pesticides should be avoided and use of bio fertilisers and bio-pesticides should be promoted.
3. In order to avoid the depletion of nutrients in soil, crop rotations should be practiced.

Control of Land Pollution

4.Proper sanitation system should be used to discharge the contaminated liquid waste. Industries should develop their own effluent treatment plants (ETP) to minimise soil contamination due to toxic chemicals from industries.

5. Afforestation and bioremediation can reduce the soil erosion and maintains nutrient circulation.

Wasteland

Land is a precious resource because it is used for agriculture, pastures and grazing fields, housing, agroforestry, roads, industrial areas, forestry, etc.

Wasteland is a land which is

(i) *abandoned*,

(ii) *degraded* and thus ecologically unstable,

(iii) *incapable* of producing material or service of value,

(iv) *eroded*,

(v) *unfit* for cultivation, unproductive, unfit for grazing as greenery cannot be sustained, and

(vi) *saline*, waterlogged, not being utilised to its potentials.

Wasteland

In the year 1985, National Wasteland Development Board was established under the Ministry of Forests and Environment with an aim to effectively tackle the problem of degradation of land and to meet rising demand of fuel wood and forests.

Wasteland-Reclamation

Some of the important wasteland-reclamation practices are briefly described below:

(i) Changing Agricultural Practices

Jhoom or shifting cultivation should be replaced by crop rotation, mixed cropping or developing plantation crops which would improve fertility of land and support a large population.

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Wasteland-Reclamation

(ii) Leaching

By providing adequate drainage to flood-prone and irrigated lands, salinity can be prevented. By leaching with more water, salt-affected lands can be recovered, especially in the areas where groundwater table is not high.

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Wasteland-Reclamation

(iii) Afforestation

It means growing forests over culturable wastelands for the first time. Previously there were no forests there due to lack of seeds or other adverse factors.

Reforestation It means growing the forests over the lands where they were existing earlier; and had destroyed or degraded by forest fires, overgrazing, excessive felling, shifting cultivation, floods, waterlogging, soil erosion, etc.

Contd…

Wasteland-Reclamation

(iv) Protecting the River Banks

By providing stone, wooden or concrete pitching or by plantation of trees/vegetation along the river banks, it is possible to protect river banks against caving and cutting.

Contd…

Wasteland-Reclamation

(v) Protecting Soil Erosion by Providing Ground Cover

After harvesting, the crop residues are left on the ground. They resist wind and water from creating erosion. The ground cover reduces soil temperature and evaporation in the hot season. It thus protects the ground organisms which are helpful in aerating and rebuilding the soil.

Contd…

Wasteland-Reclamation

(vi) Ecological Succession

This is a natural process of establishment or reestablishment of an ecosystem. In ecological succession, the slow-growing native grasses assist in reclaiming the minerally deficient soils in mining and industrial wastelands.

Contd…

Wasteland-Reclamation

(vii) Drainage

It is required for waterlogged soil reclamation where excess water is removed by artificial drainage.

In areas where waterlogging happens after heavy rains, surface drainage is facilitated to remove the excess water.

Subsurface drainage is better because chances of evaporation of water leading to accumulation of salt almost become nil in this method.

Wetlands

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.

Types of Wetlands

Marshes: Marsh is usually found near a river, lake or tidal waters. Marshes are subject to periodic flooding, and the water level can change drastically in a short amount of time.

Swamps: A Swamp is essentially a wooded marsh. Unlike marshes, swamps can support trees, tall shrubs, herbs and mosses. Swamps are covered with still or gently flowing water during wet seasons.

Bogs: Made by peat accumulation, usually dominated by moss. Bogs appear where the water at the ground surface is acidic. Bogs are generally formed by rain water.

Fens: Made by peat accumulation; may be dominated by sedge, reed, shrub or forest. Fens are mostly fed by surface or groundwater.

Ramsar sites

Ramsar is a city in Iran. In 1971, an international treaty for the conservation and sustainable use of wetlands was signed at Ramsar. The Convention's mission is "*the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world*".

- 42 Ramsar sites in India
- Deepor Beel, Guwahati, Assam

The Montreux Record

The Montreux Record is a register of wetland sites on the List of Wetlands of International Importance where changes in ecological character have occurred, are occurring, or are likely to occur as a result of technological developments, pollution or other human interference. It is maintained as part of the Ramsar List.