

## **SOIL EROSION:**

There is nothing in the whole of nature which is more important than or deserves as much attention as the soil. Truly it is the soil that makes the world a friendly environment for mankind. It is the soil which nourishes and provides for the whole of nature; the whole of creation depends on the soil which is the ultimate foundation of our existence.

Care is needed to maintain soils in fertile condition and to prevent or minimize economic and environmental impacts of erosion. Soil erosion can be loosely defined as:

Erosion is the removal of soil particles by the motion of wind or water. It may be defined as the detachment and transfer of soil from one place to another by various natural agencies that are wind and water. Removal of top or surface soil by wind or water is also called as erosion.

More rapid erosion rates of soil usually occur as a result of human activity and this is called as accelerated erosion or simply soil erosion. Widespread agricultural activities generally result in a decrease vegetative cover and are, therefore, a significant contributor to soil erosion. In some cases, the health and prosperity of communities can be threatened by severe erosion rates.

Soil erosion occurs wherever the soil surface is exposed to the agents of erosion such as water, wind or gravity. Whenever vegetation is cleared or lost due to climatic change and the soil surface exposed, there are fewer plants to absorb the force of wind and hence, wind erosion increases. When there is less vegetation to intercept the energy of falling raindrops and impede the surface runoff flow, water erosion increases. With more surface runoff, streams and rivers become increasingly able to carry away large amounts of sediments. With less plant roots to bind soil on steep slopes, erosion due to mass movement increases.

Soil erosion usually occurs at much higher rates on the land that is denuded and reshaped for urban development, roads and mining than on agricultural land. Although erosion is less harmful to these sites than to agricultural land, the eroded soil from both non agricultural and agricultural sources often causes major problems downstream. Thus, erosion may cause damage in the three places:

1. To the land from which the soil is removed
2. To the water that transports it
3. To the site where it is deposited.

In this way, soil erosion reduces the productivity of agricultural lands.

### **Effects of Soil Erosion:**

1. By erosion top soil is removed by water or wind and subsoil is exposed which is low in nutrients, poor in physical properties that results low yield per acre. In this way, area under cultivation becomes less.
2. As surface soil is removed and sub soil is exposed, so farming of sub soil is expensive and non profitable.
3. Tillage operations are difficult in sub soil due to its hardness.

4. Removal of top soil disturbs the level of the soil and hence, fields can not be irrigated evenly.
5. Soil carried by wind or water is deposited in another field where crops may be growing that is buried.
6. Sometimes a layer of infertile subsoil is deposited over highly productive soil, thus greatly reducing crop producing power of soil.
7. Soil removed through erosion may be deposited in streams, canals and other water reservoirs. Thus, beds of rivers or canals rise up and may cause floods.
8. When water reservoirs are silted up, their capacity to store water is reduced.

### **Socioeconomic effect of erosion:**

1. Eroded soils are usually less fertile and hence, there will be less production that means less income.
2. When there is much erosion, majority of the people will leave that place and they will move towards places where there is less erosion or they will come towards towns or cities.
3. If there will be less production, there will be less recovery of taxes from that area. Its ultimate effect will be more taxes on the population living in other areas of the country.

### **Comparison of Normal and Eroded soil:**

Sr. No.	Normal Soil	Eroded Soil
1	High biological activity	Low biological activity
2	Soil will be rich in nutrients	Soil will be poor in nutrients
3	Good Soil Texture	Poor Soil Texture
4	Good Soil Structure	Poor Soil Structure
5	More organic matter	Low organic matter
6	Easy tillage operations	Difficult tillage operations
7	High crop yields	Low crop yields

### **Factors/Causes of Soil Erosion:**

The following are the factors on which soil erosion depends.

- I. **Rainfall:** If rainfall is well distributed, falls with enough intervals and in less quantity, erosion will be less as compared to heavy and frequent rainfall.
- II. **Slope of the land:** If slope of the land is more, the velocity of water will be high and erosion will also be more. Also more water is likely to runoff.
- III. **Nature of soil:** If soil is hard and compact in nature, it will resist more to erosion as compared to the soil which is loose and porous. Though hard soil has more runoff, yet erosion is less due to the compactness of soil particles. Also the compact soil is not blown by the wind.
- IV. **Vegetation on the land:** If the land is covered with vegetation, erosion will be less. On the other hand, soil particles will be more easily eroded if land is bare and naked.

- V. **Cultivation method:** If land is kept under crops at intensive scale, the soil will remain covered with crops for most of the time and thus the chances of erosion will be minimized.

### **Types of Soil Erosion:**

There are two types of soil erosion which are as under:

- a. **Water Erosion**
- b. **Wind Erosion**

In addition to these major types, there are also some types of soil erosion which are as under:

- i. **Accelerated Erosion:** It occurs when people disturb soil or the natural vegetation by grazing livestock, cutting forest for agricultural use, ploughing hillsides, or tearing up land for construction of roads and buildings. This type of erosion is often **10-1000 times** as destructive as geological erosion especially on sloping lands in regions of high rainfall.
- ii. **Geological Erosion:** Erosion which takes place naturally without the influence of human activities is known as geological erosion.