

SOIL CONSERVATION 1990

Soil is a top cover of the earth in which plants can grow. We are completely dependent upon the soil for our basic needs. In fact soil supports man, animals and all living plants living on land. The destruction of fertile top soil by erosion is fraught with grave consequences to mankind. It takes nature 400 to 1,000 years to build one inch of top soil, but a single dust storm can blow it away and a single flood can wash it out to sea. With the loss of valuable upper layers of the soil are also lost the best guarantees of continued supply of food and lumber. It is therefore necessary that the soil should be protected against loss. This is called soil conservation.

Soil conservation is concerned with keeping the soil in place, the maintenance of soil fertility and the efficient use of land with a view to establishing a stable, scientific agriculture.

? The various methods employed for this purpose aim at keeping the soil protected by close growing vegetation and maintaining its humus and mineral content. Following are some methods to control soil erosion and thus the ~~cons~~ conservation of soil.

1. Soil fertility → On infertile soil plants do not grow well. Such a soil is more exposed to wind and water erosion. Fertility of the soil depends upon its humus content and mineral content. Fertile soils support thrifty crops which protect the soil against

wind and water, erosion, leave more residue material in the form of stubble of maize or cotton, Potato, tops and stubble of wheat, oat or barley. These hold and protect the soil and later on when they are converted into rich humus by the action of fungi, bacteria and other micro-organisms which bring about their decay. Plants also require a number of mineral elements from the soil. When the supply of essential mineral nutrients in the soil decreases, the plant cover becomes poorer and poorer. The soil is then more exposed to water and wind erosion, and the top soil is removed. To prevent this, the fertility of the soil must be restored. This can be achieved by the addition of manure and ~~some~~ commercial fertilizers like Ammonium phosphate, Potassium nitrate, Ammonium sulphate, rock phosphate or basic slag.

Legume crops play an important role in maintaining soil fertility. Their cultivation and ploughing under adds the much needed nitrogen to the soil and helps to keep up the yield of grain and grass crops.

2. Crop rotation → Crop rotation is the old practice of growing different crops in regular order on the same area over a period of years. This restores the needed minerals to the soil. In crop rotation the sowing of leguminous crops such as

ground nuts, beans, grams and alfalfa as part of the rotation programme restores the much needed nitrogen compounds to the soil. On lands that wash rather easily grass for several additional years makes a longer and better rotation. Crop rotation prevents soil depletion and especially when used with farm ^{manures} ~~manures~~ and commercial fertilisers, it is valuable in the control of erosion, weeds and many plant diseases.

3. Control of grazing → sheep and cattle eat the green parts of plants. The excessive loss of leaves gradually leads to the starvation of roots and rhizomes which hold down the soil. The surface soil trampled under the hoofs of animals become compact so that rain water no longer soaks readily and the ground water remains drier than under conditions of undisturbed nature. Cropping off the tops of plants prevents them from ^{and} ^{stems} ~~receding~~ themselves. After a period of years the soil becomes weak and the top-soil is easily blown away by wind washed away by water. It is therefore, necessary that excessive grazing should be prevented.

4. Reforestation → Rapid erosion by water takes place on the steep land of hills. On such soil long term meadows or pastures give good protection to the soil. Steeper, more easily eroded lands are better protected by planting them with forests. Erosion should be controlled before planting.

because several years pass before the trees that are planted become large enough to hold the soil in place. Once well established, they afford excellent protection to the soil against erosion. The forest trees build up a thick layer of humus to prevent floods and erosion. Roots of trees and other plants serve as a natural dam, catching and holding rain water and preventing it from washing away the soil. Forest also minimize the wind velocity thus checks the soil erosion by wind.

5. Contour planting → This is practised on hill slopes. The land is ploughed at right angles to the slope instead of up and down the slope. On such soils, tilling, sowing and harvesting operations on the contours or crosswise have many advantages. The crosswise depressions left by the plough catch and hold water until it soaks. The ridges check the flow of rain water straight down the hills so that there is more time for absorption. When the plants are in rows across the slope, much more water is held by them than if the rows had been built up and down hill.

6. Contour strip cropping → If entire slopes are ploughed and planted as one unit, the rain water flows down the entire slope and collects in low places. If the

slope is long, the rain water in passing down over the surface becomes faster and soon attains great cutting and carrying power. Heavy rain would cause gully-ing and ~~severe~~ severe sheet washing.

Now a days, long slopes are broken up into a number of strips laid out across the slopes so that crop rows are on level. strips of dense growing and soil covering crops such as alfalfa, grasses and cereals are alternated with clean-tilled crops i.e., those that are cultivated to leave bare soil between rows such as maize or potatoes. This arrangement checks the momentum of run of filters out the soil carried from the tilled areas and increase the absorption of rain water.

7. Terracing → The slope is divided into a series of small flat field called terraces. Each terrace may be further provided with a slight slope towards the outlet. These channels break up long slopes into a number of small water sheds. These serves as bunds along the contours. The object is to slow down the flow of water and lead it to ^{the} sides of the fields where it flows away without eroding the soil.

8. Flower Fallowing → The fields are ploughed and then allowed to lie idle for a season. This method though expensive

builds up a good supply of valuable mineral elements, especially nitrogen, in the soil.

9. **Dam building** → Dams built in the head waters of major streams are very effective in checking soil erosion. Dams not only control floods but also collect surplus water and store it for use for irrigation purpose during dry season. The Bhakra & Nagarjuna Dams and projects in the Damodar valley have turned unproductive land into prosperous fields.

10. **Gully Control** → Fast running water cuts deep ditches in hills, making the land unfit for farming. These gullies are prevented by

- ① building dams across them to catch silt,
- ② Planting grass, trees or shrubs in gullies, and
- ③ blocking the flow of water by boards at regular intervals across gullies.

11. **Control of wind erosion** → The measures adopted for the control of wind erosion include the covering of soil with vegetation, keeping the soil rough rather than smooth, strips cropping and seeding crops across. The ~~prevail~~ prevailing direction of wind, making furrows across the slopes for holding water, and planting rows of trees across the prevailing winds as wind-breaks.