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# Soil and Water Conservation

## *Soil Erosion*

It is the removal and carrying away of the surface soil by the action of water or wind.

## *Types*

(i) Raindrop (Splash)
(ii) Sheet
(iii) Rill
(iv) Gulley

## *Effects*

(i) Loss of plant nutrients and micro-organisms, hence reduced crop yield.
(ii) Damage to crops e.g lodging and up-rooting.
(iii) Siltation of dams, lakes and rivers.
- Water pollution
- Interference with hydro-electricity.
- Interference with fish farming.

(iv) Degradation of the land e.g. poor pastures.
(v) Shortage of water.
- Water displaced by soil in rivers spreads over a wide area resulting in more evaporation.
- Silt covers water sources.

(vi) Increases cost of production.

## *Factors Influencing Soil Erosion*

(i) Amount and intensity of rainfall.
(ii) Slope of the land.
- The steeper the land, the higher the velocity of water.
- The higher the velocity, the greater the amount of soil carried.

(iii) Type of soil e.g. sandy soils are more easily detached and carried away than clayey soils.
(iv) Soil depth
- The deeper the soil, the longer it takes to be saturated with water.

(v) Vegetation cover.
- Leaves intercept rain drops, reducing their momentum.
- Roots hold the soil particles together.
- Leaf-falls act as mulch which reduces erosion.
- Overstocking leads to bareness of the land and looseness of the soil.
- Deforestation - indiscriminate removal of trees leads to exposure of soil to heavy rainfall and high temperatures.
- Indiscriminate burning of vegetation exposes the soil to erosive agents.
- Clean weeding leaves the soil bare.

(vi) Poor farming methods..
- Ploughing along the slope.
- Monoculture or continuous cultivation.

## *Methods of Soil and Water Conservation*

**Objectives**

(i) To prevent soil loss by covering the land and reducing the slope.

(ii) To obtain clean water by preventing siltation.

**1. Terraces**

Are structures constructed across a slope to decrease the length of a slope into shorter stretches.

*(i) Bench terraces* :

Are constructed where the slope is 35-55%. Tree crops are suitable plants.

*Importance of a Bench Terrace*

- Reduces slope of the land.
- Conserves soil moisture.
- Better retention of soil fertility.

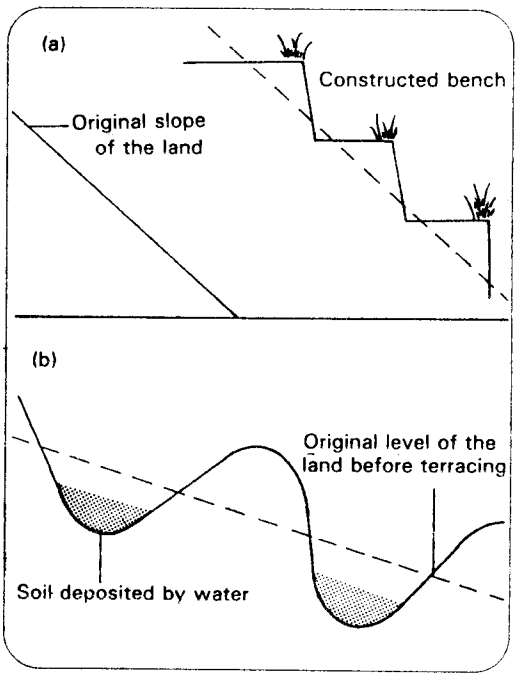


*Fig. 4(a):* Bench terrace (b) Narrow based terraces.

*(ii) Narrow based terrace:*

Cannot allow cultivation by machines.

*(iii) Broad based terrace:*

Is wide enough to allow cultivation by machines.

*(iv) Graded terraces:*

Have a drainage channel to lead off excess water to a vegetated place. They should be about 100m in length.

*(v) Level terraces:*

Have no outlet channels, the aim is to have water infiltrating hence no water can flow from the ends of the terrace.

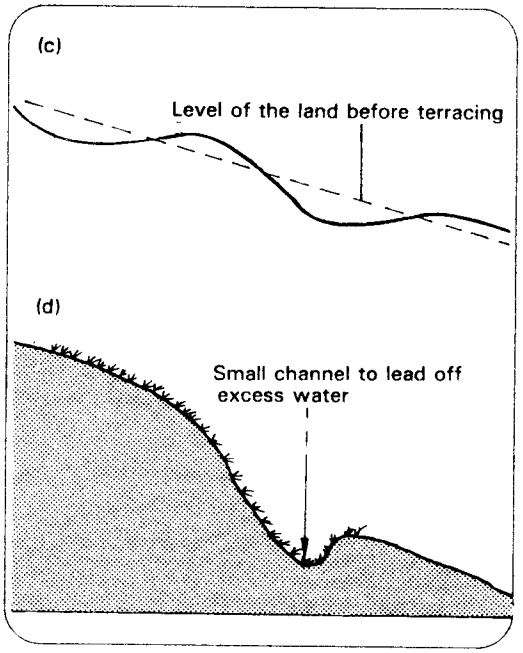


*Fig. 4(c):* Broad based terrace (d) Graded terrace.

**2. Cropping systems**

Examples are contour farming, strip cropping, windbreaks and shelter belts, crop rotation, early planting, intercropping, green manuring and mulching.

**3. Filter strips**

It involves the growing of an open crop on the upper side of the slope followed by a dense crop to reduce the speed of water, hence increase infiltration e.g. bananas followed by napier grass.

**4. Cut-off-drains**

Channels made to drain out the water from the farm before it causes damages through erosion. Water should

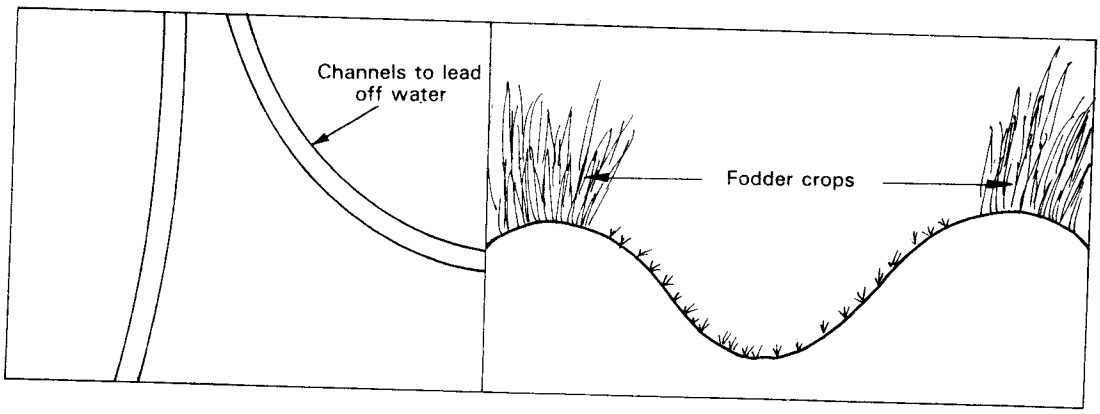


*Fig. 4(e):* Cross-section of a cut-off drain.

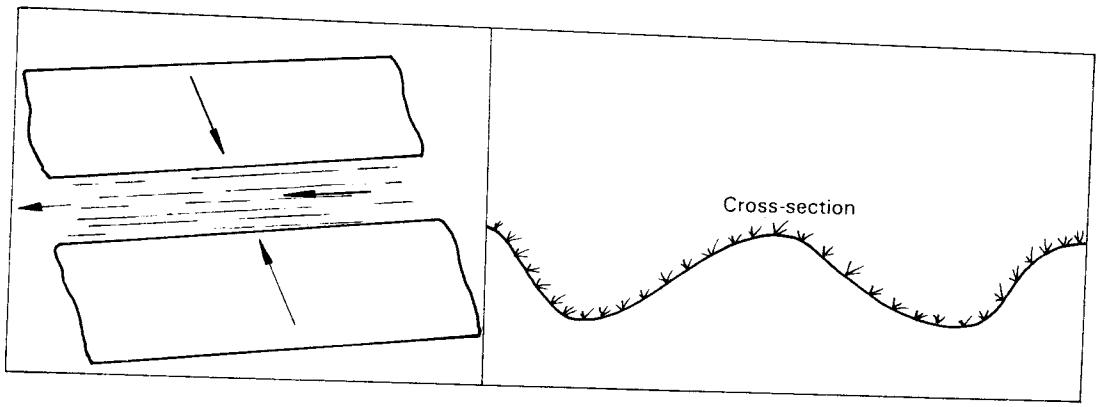


*Fig. 4(f):* Grassed waterway.

be discharged to natural waterways, rocky ground, grass, etc.

5. **Grassed waterway**
   Channels to lead off water from the farm, their bases have grass growing which help to reduce speed of water and hold the soil.
6. **Trash/stone line**
   Is a method carried out to heal a gulley.
7. **Ridging**
   Helps to reduce the speed of water, detain the water for sometime hence increase water infiltration.
8. **Planting of trees.**
9. **Practising proper stocking rate.**

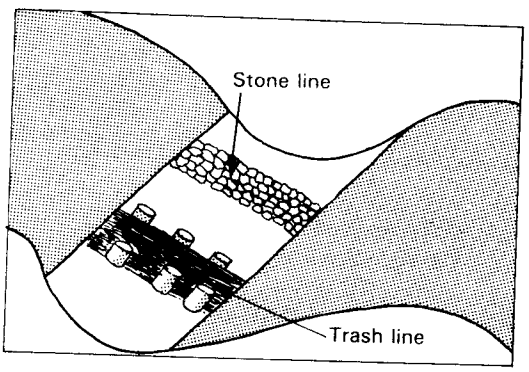


*Fig. 4(g):* Trash and stone line.

**WORK TO DO**

1. State two causes of soil erosion.
2. Describe how splash or raindrop erosion initiates the carrying away of the soil.
3. Explain the importance of grass cover as a means of preventing soil erosion.
4. State the various stages of a gulley erosion.
5. How does man's activities contribute to soil erosion?
6. Why is it that sandy soils are more erodible than clayey soils?
7. When choosing trees and shrubs for agro-forestry, they must have certain characteristics. List four of these characteristics.
8. Name the source from which the farmers can obtain new ideas on soil and water conservation.
9. Write short notes on each of the following:
   (a) Strip cropping.
   (b) Contour farming.
10. (a) Explain the effects of siltation in dams, lakes and rivers.
    (b) State methods of preventing siltation.