Various measures of soil conservation

Part II (1+1+1 System) Geography Hons.
Paper: IV
Module: VI
Topic: 2.2

Soil conservation measures:

Conservation and restoration of soil is necessary to protect our cultivated farms and expand available land for agriculture with a view to increasing food production for the future.

Conservation measures must therefore fulfill the following objectives:

(i) protection of the surface from the impact of raindrops,
(ii) increase in rainwater infiltration,
(iii) decrease in the volume and velocity of surface runoff,
(iv) enhancement in soil resistance to erosion by judicious modification of the physical and chemical properties of soil resource.

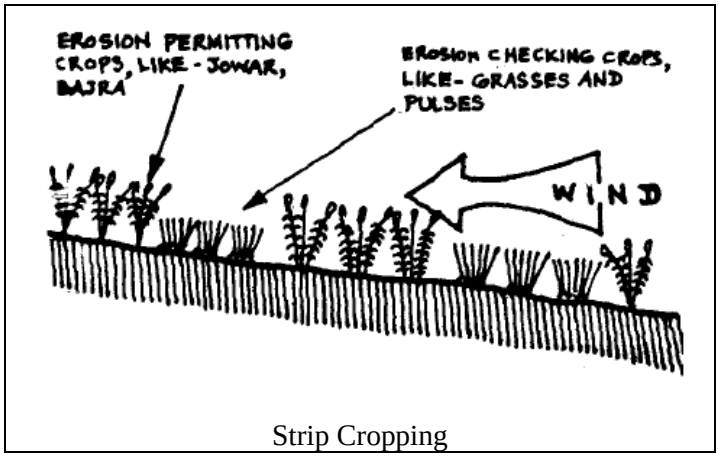
Before initiating soil conservation measures, some steps should be followed:

(i) extensive survey of affected areas,
(ii) classification of agricultural and forest lands on the basis of land capabilities,
(iii) identification of areas affected by low, moderate and severe soil erosion, and
(iv) enlisting the prime priorities of soil conservation and land reclamation.

Broadly, practical methods of soil conservation are: (a) Biological measures and (b) Mechanical measures.

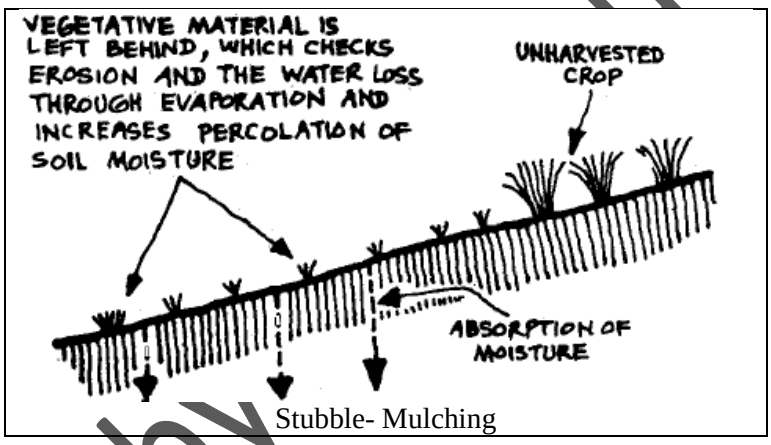
Biological Measures

1. Improving the existing surface cover: This can be done by resorting to cover cropping by growing groundnut or berseem (a fodder crop) or through grasslands development by growing grasses like dub, kudzu and pans.
2. Crop rotation: This refers to growing of two or more different crops in sequence in a field maintaining the soil fertility. Continuous growing of clean-cultivated crops (e.g., tobacco) causes more erosion. A good rotation should include densely planted small grains, spreading legume which may check soil erosion.
3. Strip cropping: This practice consists of growing erosion-permitting crops (jowar, bajra, maize) in alternate strips with erosion checking close growing crops (grasses, pulses). The erosion checking strips check and hold the flowing water and soil.



Strip Cropping

4. Stubble- mulching: This means leaving crop residue or vegetative litter on the land as a surface protection against erosion and for conserving moisture by favouring infiltration and reducing evaporation.



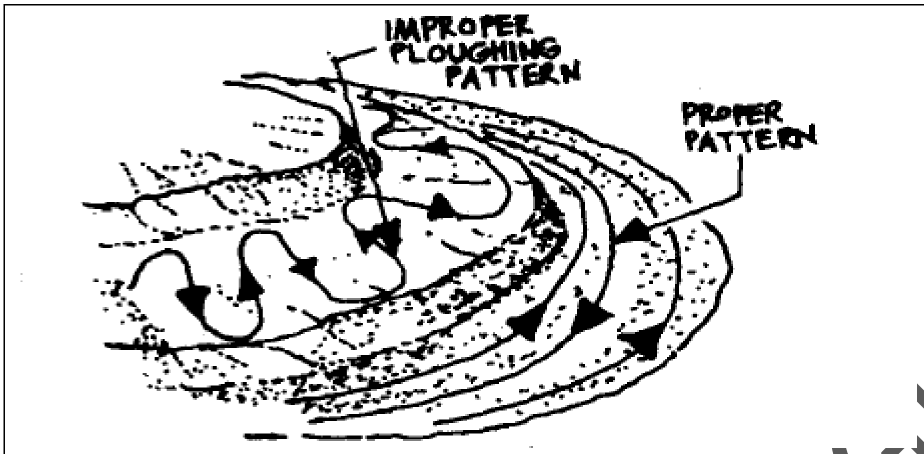
Stubble- Mulching

5. Using organic manures: Organic manures, like cow dung, green manure, farmyard manure etc., improve the soil structure. Granular and crumby structures increase infiltration and permeability in the soil and conserve soil moisture.

Other measures include **checking overgrazing, reducing surplus cattle, stopping shifting cultivation** and **taking preventive measures against forest fires**.

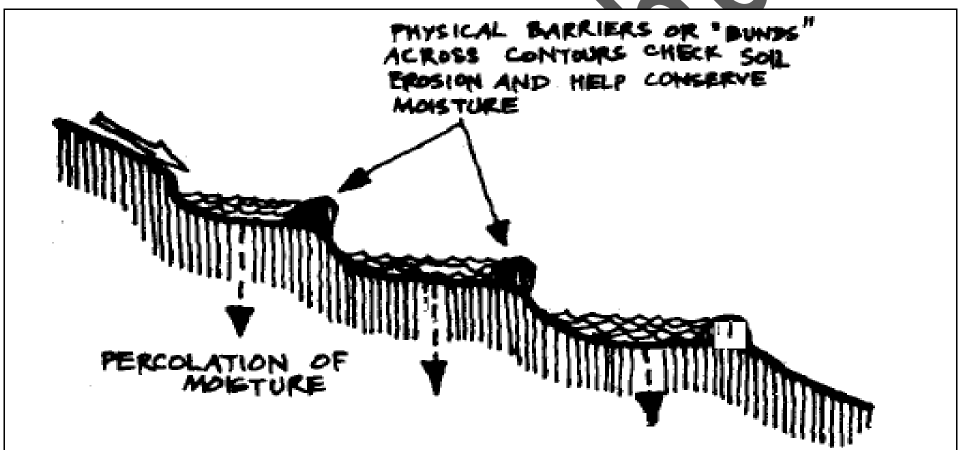
Mechanical Measures

1. Contour tillage: On sloping lands, all tillage operations should be done at right angles to the slope of the land. This way, each furrow intercepts the flowing water and allows it to soak into the soil.



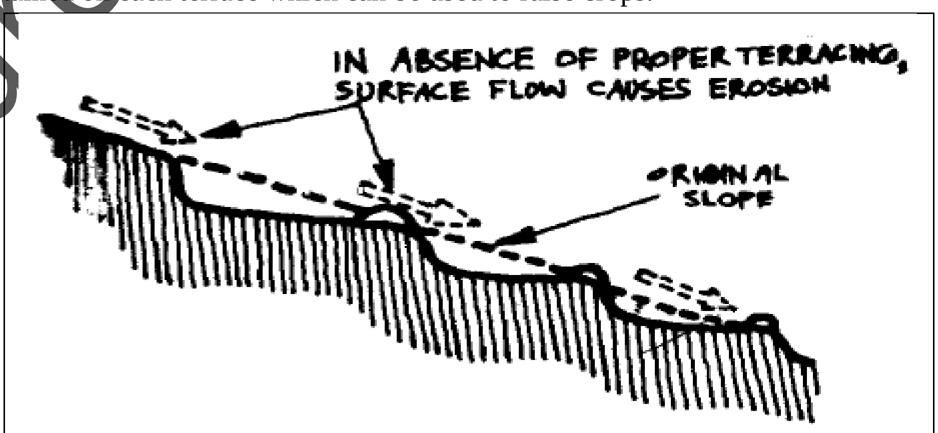
Contour tillage

2. Contour bunding: The idea is to break the slope of the land into smaller, more level compartments by constructing mechanical structures of suitable size along contours. Each bund, thus, holds the rainwater within each compartment.



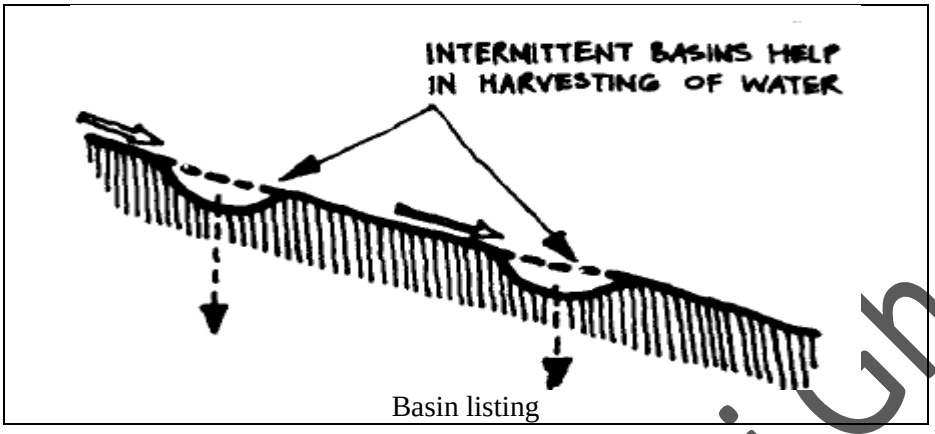
Contour bunding

3. Terracing: On steeper slopes, terraces or flat platforms are constructed in steps in a series along the slope. This way water is retained on each terrace which can be used to raise crops.



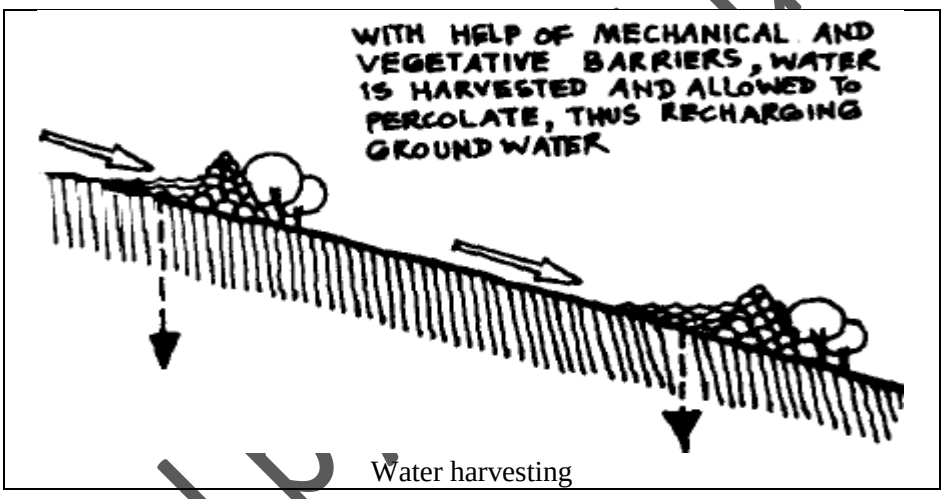
Terracing

4. Basin listing: This refers to scooping out small basins at regular intervals on slopes which help in checking the run-off and in conservation of water.



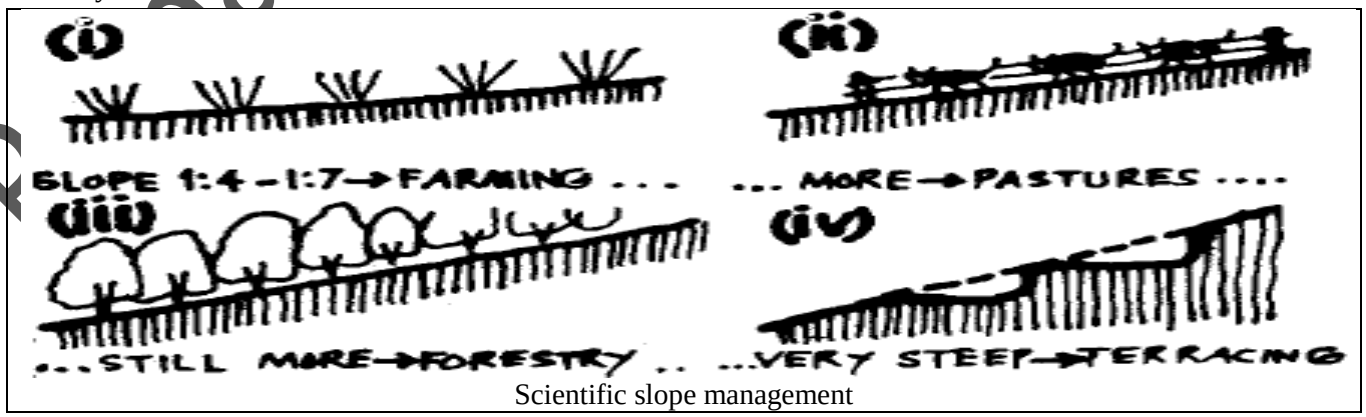
Basin listing

5. Water harvesting: This refers to trapping or channeling of water into low-lying areas. This helps in checking the run-off and also acts as a flood control measure.



Water harvesting

7. Scientific slope management: The cropping activity on slopes should be taken up as per the nature of slope. If the slope is between 1:4 and 1:7, proper farming can be done; if more, pastures should be developed; if still more, forestry operations can be undertaken; if it is still greater, then terracing is required before any cropping activity can be done.



Scientific slope management