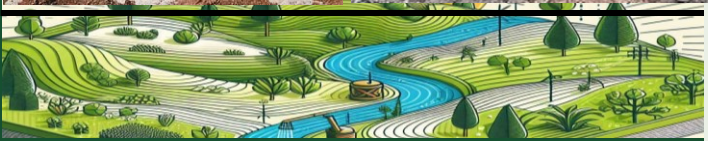
Trenching

- Construction of any form of depression or micro pit or trench over the land surface is done to arrest both excess surface runoff and silt carried with it
- Trenches may be contour trenches and staggered trenches (for high rainfall regions)
- Trenches (30 cm deep, 45 cm wide) break slope length, slow runoff, and retain water for soil infiltration.


Soil conservation Pits

- Small pits can be constructed across the slope to harvest rainwater
- Eroded soil will be deposited in the pits and water collected will be gradually infiltrated into the soil, thus increasing the moisture regime of agricultural land
- Suitable in between plantation crops grown on flat and slightly sloping lands





Indigenous technical knowledge (ITK)

- Farmers in the Wokha district of Nagaland have developed an innovative soil erosion control method known as **"Echo."** This traditional technique involves placing wooden logs, tree branches, bamboo, banana stems, and similar materials randomly across the land slope.

Prepared By:

Dr. Venkatesh, Dr. T. Esther Longkumer, Dr. Hannah K Asangla, Dr. Sharanappa C H, Mr. Manjunath K S, Dr. Harini. K. R Dr. Sanjeev Kumar Singh,

Published By:

Director

ICAR-NRC on Mithun

Medziphema, Nagaland

For more information

kvkphek@gmail.com

kvk.phek@icar.gov.in

SOIL AND WATER CONSERVATION MEASURES IN HILL AGRICULTURE

भा.कृ.अनु.प-कृषि विज्ञान केंद्र - फ़ेक

भा.कृ.अनु.प.-राष्ट्रीय मिथुन अनुसंधान केंद्र, मेड्ज़िफेमा

पोरबा, पोस्ट फुट्सेरो, फ़ेक - 797 107 नागालैंड

ICAR-Krishi Vigyan Kendra - Phek

ICAR-National Research Centre on Mithun, Medziphema

Porba, Post Pfutsero, Phek - 797 107 Nagaland

Natural Resources in Agriculture

Foundation of Life and Progress: Essential for human advancement.

Soil: Nutrient-rich: Stores vital minerals, air, and water.

Plant Growth: Enables plants to thrive, leading to abundant yields.

Water: Vital Resource: Critical for irrigation and maintaining soil health.

Sustainability: Key to long-term agricultural success

Protection: Safeguarding soil and water ensures a sustainable future for all

The Northeastern region of India faces significant soil degradation hazards due to its fragile environment, steep slopes, widespread deforestation, and unsustainable land use practices.

Causes for soil degradation?

- Shifting cultivation
- Soil erosion
- Deforestation
- Overgrazing
- Urban Growth, Industrialization and Mining

What is Soil Conservation?

Soil conservation involves practices to prevent or minimize soil degradation and maintain its productivity for sustainable land use.

Strategies in Soil Conservation

- ❖ Protecting soil from erosion & nutrient depletion
- ❖ Preventing compaction & other forms of degradation
- ❖ Promoting sustainable practices to ensure long-term soil health

BENEFITS OF SOIL CONSERVATION

Approaches to Soil Conservation

Agronomic Measures

Utilizing crops, cover plants, and organic practices

Engineering Measures

Utilizing structures like Bunds, terracing, dams

Strip Cropping

- Growing crops in strips (regular or irregular) alternated with erosion-resistant crops like grasses and fodder
- Effective on slopes up to 6%

Stubble Mulching

- Covering soil with crop residues such as Cut grasses or foliage, Straw materials, Wood chips, Sawdust, and Stones.
- Absorbes raindrop impact, reduces erosion

Contour Farming

- Tilling, planting, and weeding along the contour rather than up and down the slope
- Adopted on slopes between 2–10%

Conservation Tillage

- Retaining at least 30% crop residues on the soil surface.
- Preserves soil structure,& moisture retention

Cover Crops

- Crops like ricebean, Ipomea, gourds, and perennial grasses that form a protective cover over soil.
- Reduce erosion and maintain soil moisture

Bunding

- Used for obstructing the path of surface runoff to reduce the velocity of flowing water
- Suited for mild slopes (up to 8%) and low rainfall area

Terracing

- The degree of the slope of a hilly is changed and brought to near zero by making fields of narrow width in step like manner it is known as terracing

- Prevent formation of rills and gullies and reclaiming badly eroded gully fields

Half-Moon Terraces

Half-moon-shaped beds (1–1.5m diameter) designed for planting saplings in agroforestry and horticulture crops like Kiwi and persimmon