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Soil erosion and its control in the plantations with special reference to Nilgiris

by

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Introduction: The Nilgiris district in the Madras State though small in size with an area of 989 square miles (6,32,960 acres) has focussed the attention of Government on the problem of soil erosion and control. The indiscriminate denudation of forests and cultivation in steep slopes during the period of Second World War had largely contributed to the menace of soil erosion in this district. Worst examples of soil erosion are noticed in the leased lands under 'Grow More Food' campaign besides the ill-managed plantations of the district.

Position of Plantations in Nilgiris: The area under plantation crops, especially Tea, is increasing year by year mostly by the small growers, who were formerly depending on potatoes and cereal crops for their livelihood. It is estimated that there are about 5000 holdings ranging from half-an acre to ten acres in the district. The extent of plantation crops found in the district is shown below as seen from season and crop report 1957–58.

The area of the district	6,32,960	Acres
Net area cultivated	1,11,777	,,
Area under Coffee	22,315	,,
,, ,, Tea	42,101	,,
,, ,, Cinchona	1,810	,,
,, ,, Rubber	782	,,
,, ,, Wattle	1,485	,,
,, ,, Bluegum	2,000	,, (Estimated)
Total Area under Plantation crops	70,464	Acres.

Thus it can be seen that the plantation crops occupy more than 60% of the area cultivated.

Among the plantation crops, Tea occupies the first place. The area under Tea is increasing rapidly due to the following contributing factors :—

1. The extension of the Madras Hill Station (Preservation of Trees Act 1954) to the two taluks of Coonoor and Ootacamund. According to this act fields with a slope of more than 33% have to be planted with only tree crops which includes Tea also.

2. The liberal issues of permits by Tea Board, in recent years for the extension of areas both for new-comers and others.

3. The liberal issues of Takkavi loans by Government for establishing tea-estates upto Rs. 1,000/- per acre.

4. The gambling nature of potato crop on the the vagaries of monsoon had reduced its area and swing over to Tea which is not affected by timely rains is found in recent times.

5. Above all, the assured income from plantation crops especially Tea at about Rs. 500/- per acre per year.

These factors had influenced the ryots to switch over to Tea cultivation reducing the area under potatoes and thousands of small estates are springing up throughout the district especially in Coonoor taluk and Kundah firka of Ootacamund taluk.

Erosion Problem in Estates: In his report to the Royal Commission of Agriculture in India (1928) Mr. Rudolph Anstead, the then Director of Agriculture, Madras, had reported that on the hills big companies are growing Tea, Rubber and Coffee and they have been taught to stop soil erosion. But the position is is not so at present.

In a newly opened Tea estate, until the plants are established and cover the ground, soil erosion does great havoc. Even in a well managed estate until the bushes are able to cover the ground for which a period of about 10 years is necessary, a great portion of top soil is lost by erosion. Among the factors influencing soil erosion the slope of land, intensity of rainfall and farming practices play a prominent part. In the newly started estates, both rill and gully erosion are seen in steep slopes during the north-east monsoon period.

Remedial Measures: To combat the above menace, the following control measures are advocated by the State Department of Agriculture in the plantations.

1. *Bench terracing:* These are of six different types as shown in the sketch. (figure I) Types No. 5 & 6 are usually followed in the newly opened estates. Here suitable stone rivetments are used as vertical faces with terraces either sloping outwards or horizontal. Unlike the bench terraces adopted for potato cultivation, wherein a vertical interval of five feet is given, between the terraces, here a vertical interval of one foot is conveniently adopted giving a terrace breadth of about 3-4 feet. Terrace grade that should be followed is 1 in 400 along the terrace. These lengths are connected to vertical disposal channel to which regular contour trenches join. The tea seedlings are planted in the terraces at 3 to 4 feet distance both vertically and along the contour.

2. *Contour trenching:* Besides the above terraces, contour trenches form an essential feature for any new plantation including Eucalyptus and Wattle. By contour trenching it is meant the excavation of trenches along a uniform level at a particular contour across steep slopy

FIGURE-1. DIFFERENT FORMS OF TERRACES.

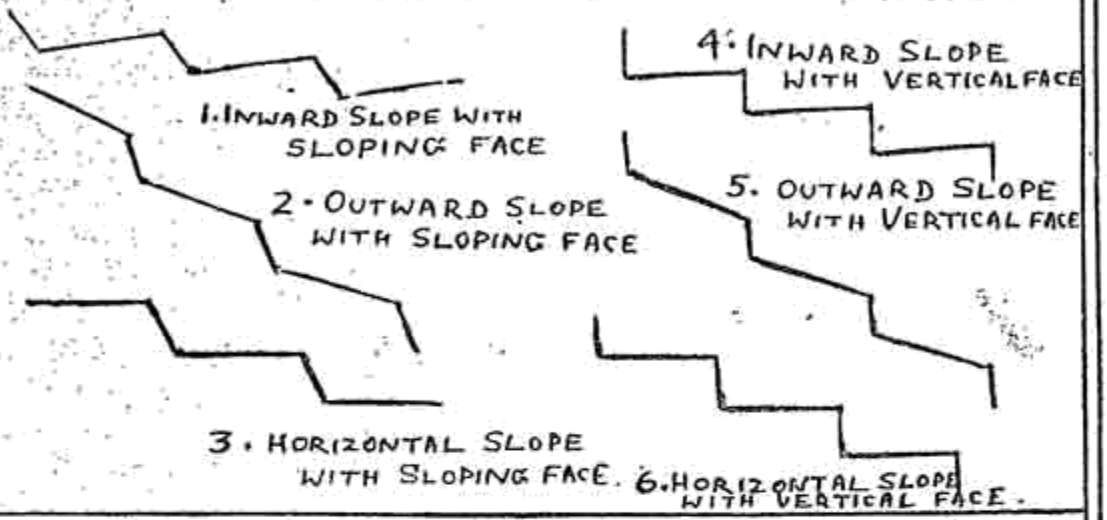


FIGURE-2. DRAINAGE PLAN OF A SLOPE.

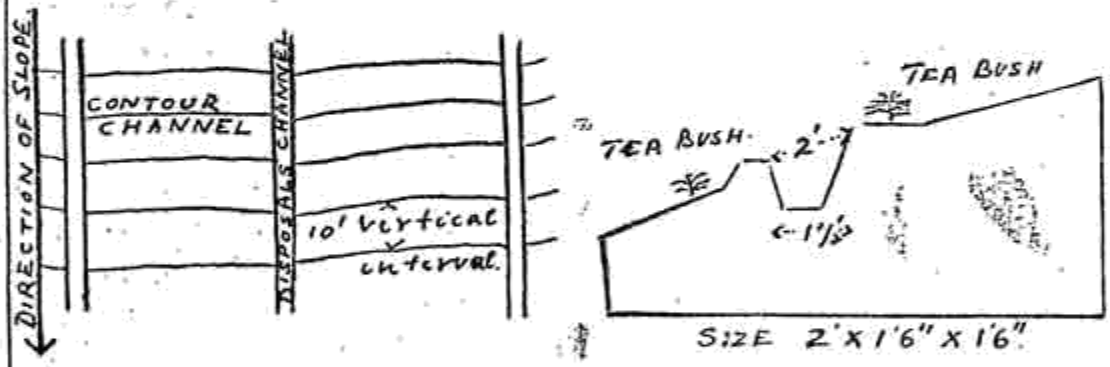
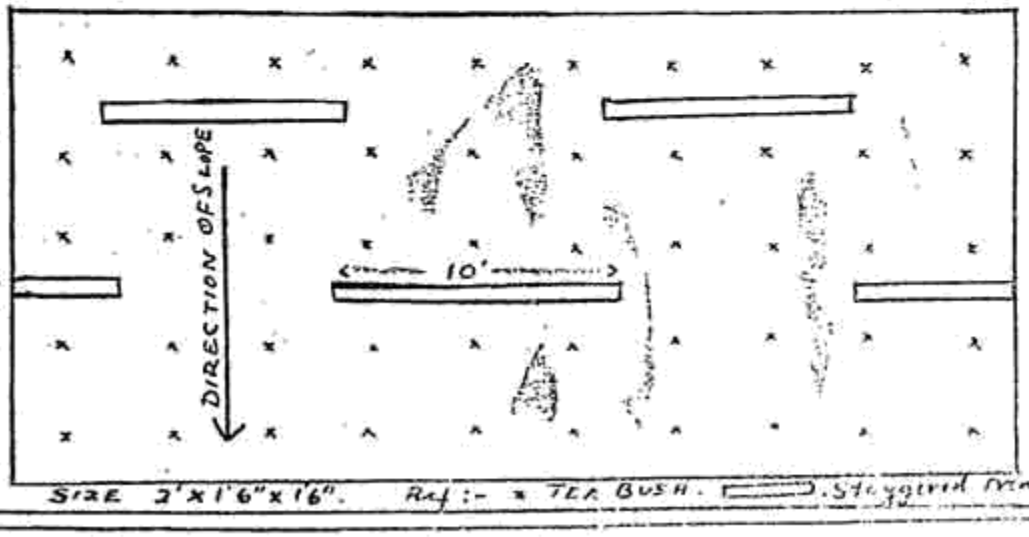


FIGURE-3. STAGGERED TRENCHING.



areas. In Nilgiris, the trenches are excavated at a verticle interval of 10 feet and the trenches are graded 1 in 400. The trenches are of 2' x 1'·6" x 1'·6" size as shown in the sketch (figure2) and the dug out soil is thrown in the lower side of the channel with embankment. By this method rainwater is held up for a long time and slowly drained to the disposal channel. The disposal channel is dug up along the slope vertically in the natural gully portion of the hillock. In these disposal channels, drop pits are excavated at the meeting places of contour channels. These drop pits are of 2' x 2' x 2' size. The drop pits besides collecting the silt washed by the contour channels, reduce the erosive velocity of run-off water thus minimising erosion. The silt collected in the drop pits are periodically dug up and applied to the bushes. Both in the contour channels and disposals channels grass slips are planted to reduce the erosive velocity besides supplying fodder to cattle. The execution of contour channels cost about Rs. 60/- to 80/- per acre.

3. *Staggered trenching:* After the seedlings are planted and established, after a period of 3 to 4 years these trenches are dug up as shown in the sketch (figure 3). The trenches are usually of 10' in length and 2 x 1'·6" x 1'·6" in breadth and depth and are excavated in between the tea seedlings on contour. The execution of above work costs about Rs. 100/- per acre.

Method of Execution: Both contour trenching and staggered trenching are new being carried out by the Department of Agriculture in in the district while the ryot is advised to carry out the bench terracing in his newly opened estates. These works are executed under the Special Comprehensive Scheme sanctioned by the Government which is applicable for the entire District. According to the existing rules, the soil conservation works are executed by the Department after executing agreements from the ryots in non-judicial stamp paper to the value of Rs. 1·50. The ryot has to pay 75% of the cost of soil conservation works and 10% of the cost of the machinary and equipment and the entire cost of establishment of the staff in the Soil conservation schemes. This amount is collected from the ryots after 3 years in 20 annual equated instalments.

Soil conservation measures in hundreds of acres have been completed both by the Department as well as by the ryots in their small estates. It is hoped that the entire plantation area under small growers will be covered soon in the fight against the menace of soil erosion.