SOIL EROSION AND CONSERVATION RESEARCH IN SIMBU PROVINCE

By B.M. Wayi, Land Utilization Officer, Agriculture Branch, D.P.I., Konedobu

INTRODUCTION

In recent years the subject of conservation (the maintenance and preservation of the environment) has been widely discussed. As land use becomes more intensive, or even changes, it seems that traditional conservation methods may not be good enough. In particular people are realising that land degradation (a lowering of the quality of the land), which includes various forms of soil erosion, is increasing in Papua New Guinea.

Land degradation is especially evident in activities such as agriculture (both traditional and new forms), forestry (especially logging), mining (notably open cut mines which produce massive spoil heaps, and engineering (for example, road cuttings). However, the seriousness of soil erosion caused by these activities in Papua New Guinea has not yet been worked out.

In answer to this concern about the need for conservation, suitable projects are being and will be funded by some National and Provincial Government Departments. The general aim of these projects is to investigate some of the problems of conservation today and to find solutions to them.

One such project already under way is an investigation of soil erosion and soil conservation in Simbu Province. It is part of the Simbu Land Use Project (funded largely by National Public Expenditure Plan, D.P.I. Sectoral Programme).

The purpose of this article is to give an outline of some aspects of this erosion project.

OBJECTIVES

The main objective of the soil erosion project in Simbu Province is to work out the relationships between soil loss, soil type, slope and rainfall erosivity (ability to erode) within the subsistence farming system. This line of research is being followed in Simbu Province because it is thought that the increasing population will lead to a shortening of the fallow period. This may reduce soil fertility and therefore reduce yields.

The measurement of the type and degree of erosion is the first step before suitable conservation measures can be designed and evaluated.

A second objective of the soil erosion project is to provide data (information) which can be used in designing long term

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The soil erosion/conservation project within the Simbu Land Use Project began in September 1979. B.M. Wayi worked on this project from November 1979 to December 1980.

research projects. Such projects would include plans for suitable land management practices for Simbu and other parts of the country.

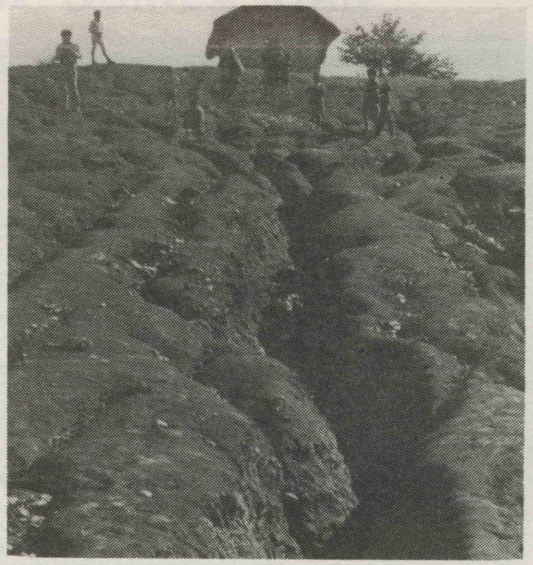
CURRENT SOIL EROSION RESEARCH

At present, information on climate, various forms of soil erosion and soil/landform relationships are being measured, or collected from other sources, and analysed.

Climatic data, particularly rainfall, is available for the northern part of the province whilst only scattered records exist for the southern part. Rainfall intensity records exist for some towns in the highlands, including Kundiawa.

It should be possible to use these data to work out the erosive character of the rainfall.

A 2 m^2 microplot on a 10 degree slope, used to measure soil loss due to rainsplash and slopewash erosion. Half a 44 gallon drum is used as a collection tray at the lower end of the plot.



Rills (erosion channels) on a 15 degree road embankment of shale, a few kilometres east of Kundiawa.

Soil loss measurements have been made in a number of places since February, 1980.

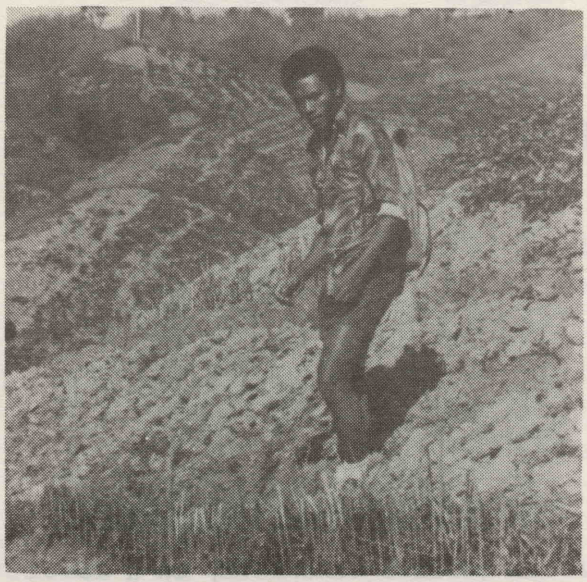
At each place, small plots of land or microplots, (1 m x 2 m) are marked out. These are divided into two groups:

Group 1. The microplot is completely covered by vegetation.

Group 2. All plants are removed, and the microplot is dug every month to keep it bare all the time.

At the lower end of each microplot a 44 gallon oil drum, cut in half lengthwise, was sunk into the soil. The cut edges are level with the lower end of the plot. When rain falls, it washes soil particles down the slope into the collecting tray. Once every month the water is removed from the trays, so that the soil can be taken out, dried and weighed.

The two types of microplot should give us information on the smallest (Group 1) and the largest (Group 2) amounts of soil loss that might occur



In Simbu, mini fences (called 'giu'), like the one in this picture are often put up across steep slopes. This is a temporary way of reducing the loss of topsoil during the cropping period.

under the subsistence agriculture system. The experiments are aimed at measuring soil loss caused by slope wash and rainsplash erosion.

It is hoped that these measurements will be continued for a number of years so that a valid analysis of the data can be made.

Data on soils, landforms, topography and geology are found in a number of published reports and maps. More information is being collected to add to this. The final report should contain an analysis of the erosivity of the rainfall, a detailed account of soil erosion and a general statement on soil/landform relationships. A map at a scale of 1:250,000 will show the information.

FUTURE RESEARCH

It is difficult to forecast what will happen in future research because changes in government priorities can affect or even dictate the kind of research undertaken. However, at present it looks as if soil loss measurements will continue as a research project of the Land Utilization Section of the Department of Primary Industry. Staff will continue monitoring the existing project.

CONCLUSION

As more land is brought under logging operations, large scale agriculture and other forms of land use, soil erosion and conservation will become increasingly important at the policy planning stage and technical levels. In future it may be necessary to make new laws to ensure that conservation practices are carried out. Personnel will have to be trained in soil conservation practices.

However, before this can be done, there must be data on which recommendations can be based. It is believed that the current project in Simbu will provide the basis of suitable information for these purposes. Meanwhile research priorities in soil conservation should be aimed at assessing erosion and the potential of land before any form of land use is begun.

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