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“Development on the margin”

Performance of Farmland Terracing in Maintaining Soil Fertility in South Wello, Northern Highlands of Ethiopia

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Abstract

Soil erosion induced land degradation is a prominent challenge in Sub-Saharan Africa countries. The problem is threatening livelihood of subsistent farmers of Ethiopia particularly in the highlands. Soil and water conservation interventions like farmland terracing have been implemented to reduce the impact of soil erosion and halt land degradation. However, terracing has been criticised for development of soil fertility gradients as well as its performance temporal and spatial variability. This study was conducted to provide quantitative information on the aforementioned issues. The study was conducted in Lake Maybar watershed, South Wello in northern Ethiopia. Soil samples collected from 16 plots in four slope category, in three terrace position and four replicates were analysed for major soil physical and chemical properties using standard laboratory procedures.

Results of the analyses show that farmland terracing brought clear difference on different positions of the landscape. Soil reaction, exchangeable bases and clay content significantly ($p < 0.03$, $\alpha=0.05$) decreased with slope of terrain. Soluble salt eroded and leached from upper slope is accumulated at the lower slope as water gets more residence time so that suspended salt precipitates down. On the other hand, comparison of soil fertility within a terrace depicted no significant differences for most soil physico-chemical properties except bulk density. Soil fertility states after two decades of farmland terracing showed nearly stabled condition with very slight change. Terracing reduced soils and soil nutrient loss through erosion but it does not completely stop erosion. In order to maintain soil fertility status, soil nutrients exported through crop harvest and residue removal should be compensated by use of organic and inorganic fertiliser. Generally performances of farmland terracing to maintain soil fertility vary with space and time. In order to optimise the impact of farmland terracing on soil fertility maintenance, terracing should be accompanied by different land management practices depending on the specific conditions

Keywords: Ethiopia , soil degradation, soil fertility, terracing