



## **Increasing the resilience of water and soil resources through successful restoration of eroded landscapes - the case of the Enabered Catchment in Central Tigray, Ethiopia**

Haftamu Deribe Zenebe (1,2) and David Finger (3)

(1) Bureau of Agriculture and Rural Development of Tigray, Ethiopia, (2) United Nation University Land Restoration Training Programme, Iceland, (3) School of Science and Engineering, Reykjavik University, Iceland

Integrated land restoration management is part of a rehabilitation approach widely implemented since 2004 in the Tigray region in northern Ethiopia. In this study we assess the effect of physical and biological soil and water conservation practices on erosion and subsequent land degradation in the Enabered watershed, a typical case study in the Tigray region. For this purpose the land uses, the gully dimension and the runoff yields before (2003) and after (2014) land rehabilitation efforts were analyzed. By means of statistical analysis the effects of various restoration measures on runoff and soil loss due to sheet, rill and gully erosion were quantified. The results reveal that large parts of the watershed could be restored and gully formation reversed. The biggest change occurred through the reorganization of homestead areas to cultivated land, accounting for 124.5 ha (18.5% of the entire watershed). The most important changes were achieved by converting bush land to area closures, forest area and plantations. In total these changes accounted for almost 50% of the total area. Furthermore, the entire grazing land and bare land were converted to plantations and area closures. Finally, the observed changes in gully dimensions reveal that restoration activities of the watershed have reduced the soil loss by 86%. Similar effects were determined in the change of the runoff coefficient, which resulted in a decreased by 32.6% of runoff yield. Based on these results the study concludes that the physical and biological soil and water conservation practices led to a successful ecological restoration, increasing the resilience of soil and water resources and finally enhancing the livelihood for the local population.