10th Alexander von Humboldt International Conference
Addis Ababa | Ethiopia | 18 – 20 November 2015
AvH10-42-1

Impact of soil and water conservation practices on sediment losses and discharge in the headwaters of the Lake Tana Basin in the Ethiopian highlands

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Donor and governmental sponsored soil and water conservation measures has been carried out in the last half century in the Lake Tana basin, Ethiopia. However, sediment loads in to the lake has never been reduced suggesting that the effectiveness of integrated soil and water conservation measures reducing soil loss needs to be investigated. The present study was conducted in two watersheds (Tikur-Wuha covers 500 ha and Guali covers190 ha) located in the headwaters of Lake Tana to investigate the impacts of soil and water conservation practices on discharge and sediment loads. In both watersheds different soil and water conservation technologies have been implemented since 2010 by the Tana Belese integrated watershed management project: gully treatment, stone buds, soil bunds, stone faced soil bunds, water ways, cut- off drains, hill side terracing, micro basins and area closures. Daily rainfall, runoff and sediment concentration were collected from 2010 – 2012. The results showed that average runoff volume was reduced by 13% in Tikur-wuha and by 7% in Guali from 2010-2012. The sediment load in Tikur-wuha watershed was reduced by 48% in 2011 and 30% in 2012, while sediment load in Guali watershed was reduced by 1% and 35% in 2011 and 2012 respectively. The results support that the implemented integrated SWC measures through government sponsored with full participation of the community and through incorporating different SWC technology options were effective in reducing runoff and sediment load. We recommend fortifying the government led SWC campaign with full participation of the local community to reduce soil erosion and siltation of Lake Tana.
Key words: Runoff volume, Sediment Load, Soil and water conservation, Tana basin; Blue Nile basin