

# **The effect of land use and hillslope position on the magnitude and rate of runoff and soil loss in Rwizi catchment, Lake Victoria Basin, Uganda**

By

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## **Abstract**

Although soil erosion is pronounced as a serious environmental and productivity problem, there are limited studies addressing the magnitude and rate under varied land use and cover conditions in Uganda. In this study, we quantified runoff and soil loss from four land uses on the slopes of Rwizi catchment in the Lake Victoria Basin (LVB). Runoff and soil loss magnitude and trends under varied rainfall regimes were measured using closed runoff plots measuring 40m<sup>2</sup> (2 X 20m). A Completely Randomized Block Design experimental design was adopted for the study. In total, 36 runoff plots were installed on sites covering four (4) land uses, three (3) hillslope segment positions and three (3) replications. The hillslope segment positions include the lower segment, middle segment and upper segment, while the land cover/land use include banana mulched, banana un mulched, grassland and tree cover. Observed monthly rainfall values varied from 9.3 to 167mm (75±54mm). Annually, the registered rainfall depth was 889mm. This falls within the expected rainfall amount for the study area. Results show that annual runoff was in the order of tree plantation>unmulched banana sites>grassland=mulched banana's. The highest and lowest annual runoff obtained was 140 and 159 m<sup>3</sup>/ha/yr. The magnitude of annual average soil loss rates registered are within the tolerable rates for tropical soils of 5 t/ha/yr. Soil losses were greatest (1.5t/ha/yr) and lowest (0.8t/ha/yr) on unmulched banana and mulched banana sites respectively. Soil loss was found to increase with slope position.

**Keywords:** Land use, hillslope position, Runoff, Soil loss, Lake Victoria Basin