Soil Erosion Effects on Soil Properties in a Highland Area of Central Kenya

C. K. K, Gachene; N. J, Jarvis; H, Linner; J.P, Mbuvi
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Abstract

One of the most important features that is neglected in many soil erosion studies in Africa is the monitoring of changes to the soil during the progress of the experiment. Objectives of this study were therefore to monitor runoff, soil loss, and enrichments of eroded soil material and to assess the effect ofcumulative soil Ioss on soil chemical properties of an Alfuol in one of the high-potential areas of Central Kenya highlands. Runoff, soil loss, and enrichments of eroded sediments were measured on newly opened ground from l9l to 1992. Annual rainfall was 948 and Il25 mm for l99l and 1992, respectively. Soil loss ranged from 0.8 to 247.3 t ha-r, and runoff ranged from I to 89 mm. No significant correlations were observed between enrichment ratios (ER) and soil loss. The ER were > I and sediments were mostly enriched with P and Na. The P and Na concentrations were 4 to 10 and 2 to 3 times the source material, respectively. Sediment from the plots was 247 to 936Vo richer in P than the soil from which it originated. Changes in soil pH, percentage organic C, and percentage total N following erosion were significantly correlated with cumulative soil loss (r values of 0.77, 0.59, and 0.71, respectivelv, n = 20). The data indicated that nutrient loss due to erosion is one of the major causes of soil fertility depletion of Kenyan soils.