Hydraulic properties of andosols following deforestation in the northern slopes of Mt. Kenya

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Date: 1999

Abstract

Deterioration in soil hydraulic properties due to deforestation adversely affects the hydrology of catchments, especially those on mountain slopes. The effects of clearing natural forest (NF) for potato cultivation (PC) and livestock grazing (GL) on the l-rydraulic properties of an andosol (after 5 to 8 years) were investigated in the northern slopes of Mount Kenya. The two farming activities have resulted in deleterious changes in soil water flow and storage. Results obtained showed that steady infiltration rates were 65.7 in NF, 9.7 in PC and 13.4 cm h{ in GL. Sorptivity decreased by 15% in PC and 22% in GL, while topsoil-saturated hydraulic conductivity decreased by 62% in PC and 76% in GL compared to NF. Both PC and GL topsoil had higher volurnetric water content at soil rnatric potentials (. - 25 cm) than NF. Cultivation and grazing in the area have Ied to compacted topsoil with lower (11%) total porosity and decreased plant available water holding capacity by 16 for PC and 79% for GL.