

Soil Quality Status under Dryland Vegetation of Yabello District, Southern Ethiopia

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Abstract : The current research has investigated the soil quality status under dryland vegetation of Yabello district, Southern Ethiopia in which we should identify the nature and extent of salinity problem of the area for further research bases. About 48 soil samples were taken from 0-30, 31-60, 61-90 and 91-120 cm soil depths by opening 12 representative soil profile pits at 1.5 m depth. Soil color, texture, bulk density, Soil Organic Carbon (SOC), Cation Exchange Capacity (CEC), Na, K, Mg, Ca, CaCO_3 , gypsum (CaSO_4), pH, Sodium Adsorption Ratio (SAR), Exchangeable Sodium Percentage (ESP) were analyzed. The dominant soil texture was silty-clay-loam. Bulk density varied from 1.1 to 1.31 g/cm^3 . High SOC content was observed in 0-30 cm. The soil pH ranged from 7.1 to 8.6. The electrical conductivity shows indirect relationship with soil depth while CaCO_3 and CaSO_4 concentrations were observed in a direct relationship with depth. About 41% are non-saline, 38.31% saline, 15.23% saline-sodic and 5.46% sodic soils. Na concentration in saline soils was greater than Ca and Mg in all the soil depths. Ca and Mg contents were higher above 60 cm soil depth in non-saline soils. The concentrations of SO_4^{2-} and HCO_3^- were observed to be higher at the most lower depth than upper. SAR value tends to be higher at lower depths in saline and saline-sodic soils, but decreases at lower depth of the non-saline soils. The distribution of ESP above 60 cm depth was in an increasing order in saline and saline-sodic soils. The result of the research has shown the direction to which extent of salinity we should consider for the Commiphora plant species we want to grow on the area.

Keywords : commiphora species, dryland vegetation, ecological significance, soil quality, salinity problem

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