

SOIL CARBON SEQUESTRATION CAPACITY MEASUREMENT PER CENTIMETRIC DEPTH UNIT: A RATIONAL APPROACH

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ABSTRACT

This study was conducted to investigate soil carbon sequestration measurement with calibration per centimeter (cm) rise in depth of soils derived from the Ajali sandstone. It was designed to determine and whether more carbon are sequestered at the epipedon or soil sub-surface horizons. The field design involves the use of transect survey technique, three profile pits were dug in 100 meters apart and evaluation of all underlain by identified false bedded sandstone (that formed Ajali formation) lithology. Standard laboratory procedures were adopted in analyzing the soils. Soil generated data were subjected to descriptive statistics and correlation analysis. Results showed that the soils were basically loamy sand and sandy loam with low pH values which ranged between 4.50 and 4.90. Soil Organic Carbon (SOC) decreased down the profile pit and ranged between 9.7 and 9.10 g kg⁻¹. Carbon sequestered by the different horizons ranged from 3072.62- 3989.9 g cm⁻². It was also found that the thicker the soil natural horizon, the more the carbon in all the profiles. Inversely, when sequestered carbon was measured against calibrated horizons in per centimeter unit rise in soil depth, it was found that more carbon were rather stored in the upper horizons than in deeper horizons which was contrary to earlier observation. The regression analysis further portray and support this finding by giving a negative relationship between sequestered carbon per centimeter against horizon thickness, indicating decrease in carbon sequestration with increase in soil profile depth. Therefore, this study established and concluded that more carbon is sequestered in the epipedal portions of the soil profile than in the sub-surface horizons.

Keywords: Carbon sequestration, calibration, Rational approach and Soil depth.