



Effects of Some Soil Management on Soil Carbon Stock in the Sudan Savanna Agro Ecological zone of Dambatta, Kano, Nigeria

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ABSTRACT:

The study aimed at assessing the effect of soil management practices on soil carbon stock for carbon sequestration in the Sudan Savannah of Nigeria. Three soil management practices: Eucalyptus plantation, cropland and grass land were selected purposively whereby 10 soil samples were collected at 0 – 15cm depth from each soil management practice and subjected to physicochemical analysis using standard laboratory procedures. The results show that the mean value of bulk density was higher in grassland ($0.96 \text{ gcm}^{-3} \pm 0.25$) than cropland ($0.71 \text{ gcm}^{-3} \pm 0.06$) and plantation land ($0.63 \text{ gcm}^{-3} \pm 0.03$) which is due to the overstocking of grazing animal and cultivation activities in grassland and crop land. The results also revealed that, D_b is positively correlated with organic C in GL ($r = 0.35$), PL ($r = 0.25$) and CL ($r = 0.05$) with coefficient of determination as: GL ($r^2 = 0.12$), PL ($r^2 = 0.06$) and CL ($r^2 = 0.002$). High mean values of carbon stock was found in PL ($2343.6 \text{ tC ha}^{-1} \pm 81.6$) which is attributed to high storage and retention capacity of soil organic carbon (SOC) due to availability of plant litter and low erosion because of the surface cover by plantation, while GL ($2150.4 \text{ tC ha}^{-1} \pm 274.98$) and CL ($894.6 \text{ tC ha}^{-1} \pm 97.55$) recorded lower values than that of PL. It was concluded that, soil is considered as part of climate change challenges and at the same time as an integral part of the solution. The extent to which soil stores and/or releases carbon to the atmosphere depends on soil management practices subjected to the area. Planting of cover crops, leaving crop biomass on the farm and rehabilitation of degraded land through afforestation should be encouraged to enhance the adsorption and retention of SOC in the sub-soil for longer period without emitting into the atmosphere.



Biography:

Mansur Abdul Mohammed completed education in Bayero university and currently works at the Department of Geography, Bayero University, Kano. Mansur does research in Geochemistry, soil pollution, carbon sequestration and food security, environmental quality.

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3. Impact of Soil Microbial Respiration on Atmospheric Carbon Under Different Land Use in Part of Kano State, Northern Nigeria
4. Ecological risk assessment of heavy metals pollution on irrigated soil along Salanta River Valley, Kano State Nigeria
5. Soil Management Strategies for Carbon Sequestration in Dryland Ecosystem: The Case of Dambatta LGA, Kano State - Nigeria

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