

Soil Organic Carbon Stock Tracking in Uganda

Methodology for the national SOC stocks survey · Sustainable Land Management Uganda

Estimation of the size and changes of soil organic carbon (SOC) stocks is of great importance for decision-makers to adopt proper measures to protect soils and to develop strategies for mitigation of greenhouse gases. This study assesses the relationship between soil organic carbon stocks and different land management practices at different landscape positions, across nine Agricultural Production Zones (APZs) of Uganda.

Method

1) Household surveys are conducted in three purposively selected sub-counties, one each from three selected districts in each of the nine APZs. For every selected sub-county, six households are randomly selected from each landscape position present (shoulder/upper slope, mid-slope, lower slope/valley bottom) and interviewed to collect plot-level information, including land management history. This establishes the link between SOC levels of sampled soils, prevailing land management practices, and landscape position. A total of 18 households are interviewed per sub-county in each district — 54 households per APZ, and 486 households across the full nine-zone survey.

2) After a brief interview with the household head, a one-acre plot is purposively selected to represent that landscape position, and about 15 soil cores are taken from a depth of 0–20 cm. These are mixed thoroughly into one homogenous sample (about 100 g) and sent to the laboratory at the National Agricultural Research Laboratories (NARL), Kawanda, for analysis.

Sampling deliberately avoids spots such as old fence lines, old compost pits and termite hills that could bias SOC results. About 54 homogenous core samples are obtained per APZ. Each sampling point carries elevation and spatial (latitude/longitude) information, allowing the data to be processed in a GIS environment to produce the Soil Organic Carbon Stocks Map of Uganda. Because samples are taken from only a few representative sub-counties per district, statistical interpolation is used to estimate SOC stocks for unsampled areas, with supplementary field surveys planned to validate the resulting map and determine its accuracy.

Responsible persons

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