SOIL ORGANIC CARBON AS AN INDICATOR OF SOIL QUALITY: A STUDY IN SELECTED TEA PLANTATIONS IN GALLE DISTRICT

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Assessment of soil quality in tea lands is important to determine the extent of degradation and introduce sustainable land management practices. A study was undertaken in two stages to assess the suitability of soil organic carbon as a soil quality indicator in tea lands. Soil samples were taken from 0-15 cm tea estates in the Galle District of Sri Lanka. In the first stage, soil samples were depth from selected taken from 15 locations under four different field categories viz., under rehabilitation, rehabilitation completed, planted tea following rehabilitation and planted tea without rehabilitation. Second stage involved sampling of a tea field under rehabilitation and tea fields of various ages (3, 7 and 11 year old) situated at one location. Soil samples were also taken from two forest sites to assess the impact of cultivation on soil organic carbon. Bulk density was measured at the field and soil samples were analyzed for total organic carbon.

Results revealed that land management has a significant impact on the quantity of soil carbon in tea plantations. While rehabilitation process has increased the soil carbon content, nearly 15% of the added carbon is lost during the initial years after planting tea. Forest soils had a soil organic carbon (in the 0-15cm soil layer) range of 3.39 to 4.42 kg m^{-2} compared to 3.02 to 3.18 kg m^{-2} observed in rehabilitated tea lands. The 11-year old tea field has lost over 40% of its soil organic carbon since rehabilitated and planted with tea. Soil organic carbon can be considered as a robust indicator of soil quality and more research is required to establish critical levels of soil carbon for tea lands in different stages of the cultivation-rehabilitation cycle.