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## ESTIMATION AND MAPPING SOIL ORGANIC CARBON IN PADDY GROWING SOILS OF MONARAGALA DISTRICT, SRI LANKA

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Soil carbon sequestration is prominent and the most effective natural way to reduce the atmospheric concentration of CO<sub>2</sub> and slow down global warming. The paddy ecosystem is considered one of the most important carbon pools as it stabilizes more carbon under water-logged conditions and has a great potential in sequestering atmospheric carbon dioxide. The present study was carried out in paddy growing soils of Monaragala district, Sri Lanka, to identify the carbon sequestration capacity and the spatial distribution patterns of soil carbon concerning the different paddy growing soil types and the climatic conditions. This study adopted conditional Latin hypercube sampling (cLHS), designed to determine sampling locations and the total 35 soil samples were collected representing the paddy growing areas of the district and analyzed for the soil carbon content by using CHN elemental analyzer. The Regression kriging interpolation technique was utilized in Arc- GIS environment to predict the spatial distribution patterns of soil carbon. According to the results, soil carbon content varied from 1.2% to 2.1%, with mean value of 1.6%. The highest soil carbon content stocks (1.7% - 2.1%) were observed in south-western and western side in Monaragala district. The highest soil carbon content (1.9%-2.1%) was observed in the Sevanagala DS division in DL1b agro ecological sub region. This agro ecological sub region is characterized by two detectable peaks in the rainfall distribution. The soil organic matter content in the soil varies with the soil types. Soil with a high organic matter content generally has a lower bulk density and increased soil organic carbon stock. Soil organic carbon stocks were calculated based on the carbon concentration of soil, the actual depth of sampling and the bulk density of soil. The mean SOC stock was varied from 15.2 Mg ha<sup>-1</sup> to 55.6 Mg ha<sup>-1</sup> with mean value of 31.1 Mg ha<sup>-1</sup> for the topsoil layer. The major soil types of the area, Reddish Brown Earths (RBE) and Immature Brown Loam soil, Alluvial soil, Reddish Brown Earths (RBE) & Low Humic Gley soil and Miscellaneous land units were reported with 39.3 Mg ha<sup>-1</sup>, 37.2 Mg ha<sup>-1</sup>, 29.4 Mg ha<sup>-1</sup>, and 26.7 Mg ha<sup>-1</sup> SOC stock values respectively. The output generated from this study will provide the baseline information on the current status of SOC stocks in paddy soils of Monargala district and it will be useful for the establishment of national carbon accounting system in Sri Lanka.

Keywords: Agro- ecological zones, Paddy, Soil carbon stock, Soil organic carbon

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