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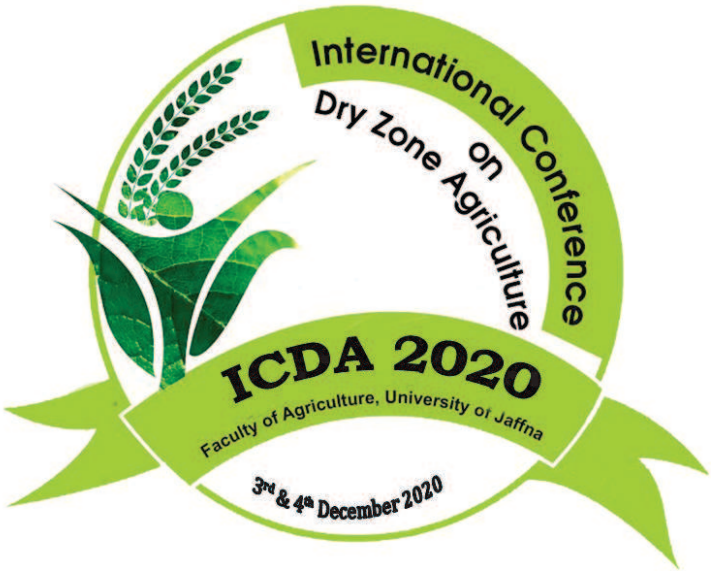

CONFERENCE PROCEEDINGS

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Spatial Variability of Soil Carbon and Its Relationship with Nutrient Availability in Paddy Soils of Trincomalee District, Sri Lanka

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Global warming is likely to be the most threatening environmental issue. Hence, the soil's contribution to reducing CO_2 concentration from the atmosphere through the process of soil carbon sequestration has gained considerable attention. Therefore, this study was carried out to quantifying Total Soil Carbon (TSC) stocks and mapping its spatial variability using spatial soil data in paddy cultivation areas of Trincomalee district which acquires sixth rank of rice production in Sri Lanka. The sampling locations were allocated using Conditional Latin Hypercube Sampling Design. Fifty two sampling locations were allocated at 0-15 cm soil depth representing different soil types. TSC content was estimated by using CHN elemental analyzer and soil carbon stocks (t/ha) were calculated. Digital map was designed using distribution of TSC in each respective soil types. Moreover, Total Nitrogen (TN) and soil nutrients including K^+, Ca^{2+} and Mg^{2+} were analyzed using standard protocols. Pearson's correlation analysis was performed to determine correlation between TSC and other soil nutrient content. The results showed, the mean TSC stock ranged between 35.64 and 48.79 t/ha and average carbon stock was 41.59±2.5 t/ha in top soil layer. The Alluvial soil (48.79±3.32 t/ha) and Reddish Brown Earth & Low Humic Gley soil (45.95 ±3.27 t/ha) had higher carbon contents, than other soil types. The findings of this study highlighted the close relationship between soil type and the soil carbon distribution in paddy soils. Total carbon was positively correlated with TN, Ca^{2+} and Mg^{2+} and it showed linear relationship between soil carbon and other nutrients. Hence, this relationship depicts the importance of soil carbon towards plant nutrition. The information generated from this study will be useful for future carbon trading.

Keywords: Carbon sequestration, Mapping, Paddy soils, Soil carbon