CARBON SEQUESTRATION OF COCONUT MONOCROPPING AND COCONUT-GLIRICIDIA INTERCROPPING SYSTEMS IN THE INTERMEDIATE ZONE OF SRI LANKA

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Coconut (*Cocos nucifera*) plantations in Sri Lanka have a greater potential of climate change mitigation through carbon sequestration. Absence of quantitative information on carbon sequestration of coconut plantations invited present study to estimate carbon stocks and sequestration rates of coconut monocropping and coconut-gliricidia (*Gliricidia sepium*) intercropping systems on S_2(highly suitable) and S_4 (marginally suitable) lands suitability classes in the agro-climatic zone, IL_1 of Sri Lanka. Twenty five coconut and gliricidia plants and six soil samples at a depth of 25 cm were analysed for each system. Above ground biomass of coconut and gliricidia was estimated using allometric equations and carbon content were considered 50% of biomass. Soil organic carbon percentage was analysed and extrapolated per hectare. Total carbon content of each system was assessed in October, 2015 and January, 2016 to estimate the carbon sequestration rate. Coconut palms on S_2 had greater carbon content (30.4-32.3 Mg of C ha^{-1}) than that on S_4 (12.3-18.7 Mg of C ha^{-1}). Soil organic carbon on S_4 (34.7-62.8 Mg of C ha^{-1}) was greater than on S_2 (20.4- 32.8 Mg of C ha^{-1}). Irrespective of land suitability class, coconut-gliricidia intercropping system had higher total carbon content (71.7-90.9 Mg of C ha^{-1}) compared to coconut monocropping system (47.7-76.5 Mg of C ha^{-1}). The greater carbon sequestration rate was with coconut monocropping system on S_4 (9.58 Mg of C $ha^{-1}month^{-1}$) followed by coconut-gliricidia intercropping system on S_4 (6.4 Mg of C $ha^{-1}month^{-1}$), coconut-gliricidia intercropping system on S_2 (0.66 Mg of C $ha^{-1}month^{-1}$) and coconut monocropping system on S_2 (0.02 Mg of C $ha^{-1}month^{-1}$). Greater carbon sequestration rate on S_4 soils were mainly attributed by high soil carbon sequestration. Continuation of the study is suggested to fine tune the findings and to identify the seasonal variation of carbon sequestration of the coconut monocropping and coconut-gliricidia intercropping systems under different growing conditions.

Keywords: Carbon sequestration, Coconut monocropping, Coconut-gliricidia, Intercropping, Land suitability classes, Soil organic carbon