

Soil carbon buildup and bioeconomics of different land uses in humid subtropics of West Bengal, India

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Abstract. Long term carbon sequestration in soil had been advocated in almost all the international forum to minimize the global warming. However, the extent of carbon storage in soil will depend on the type of vegetation it supports. The study examined different land use potentiality in sequestering carbon in soil on the basis of extent of tree component. In addition it was also investigated that how soil carbon is related with other physical and chemical parameters of the soil in different land uses. Farmers will adopt a particular land use system only if it fits in his socio-economic frame work. Hence, bioeconomics of different land uses were also calculated and compared. Extent of tree in the land use affected the physical and chemical properties of soil. The pH of the soil decreased from 6.09 to 5.09 and bulk density from 1.55 to 1.21 g/cm³ as the tree component increased. Available soil nitrogen increased from 97 to 143 kg/ha and organic carbon from 0.39 to 1.77 per cent. Out of the four soil depths surface soil had less pH, bulk density and moisture, however soil nitrogen and organic carbon was higher. Physical characters of the soil were found to be more related with organic carbon in land uses which are devoid of trees or when their number was less. However, as the tree component increases both physical and chemical component needs to be taken simultaneously to get better estimate of carbon. Agroforestry systems (agrichorticulture) seems to be better land use practices as they fulfill the needs of the farmers and can also earn carbon-credits thus increasing their income by 21 per cent.