



Impact of Restoration of Soil in a Humid Tropical Region on Storage of Organic Carbon in a Recalcitrant Pool

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Quantifying soil organic carbon (SOC) changes through restoration of degraded lands is important to assessing the changes in soil properties. However, SOC measures all C fractions and its assessment is not adequate to distinguish between the more dynamic or active C (AC) fractions and the recalcitrant or passive C (PC) form. SOC fractions comprising of the recalcitrant pools have been suggested as a driver for long term soil C sink management. Therefore, the present study was undertaken at a site within the North Eastern India (NEI) region with an objective to explore whether or not SOC fractions change with restoration of degraded lands under humid tropical climate. An age-chronosequence study was established comprising of four different aged rubber plantations (6, 15, 27 and 34 yr. old) planted on Imperata grasslands. The site was selected to study changes in the different fractions of SOC and total SOC stock, and the data were compared with that of a native forest. The data indicated that the SOC stock increased from 106 Mg ha⁻¹ under 6 yr. to 130 Mg ha⁻¹ under 34 yr. old plantations. The SOC stock after 34 yr. of plantation was 20% higher than that under Imperata grassland, but was 34% lower than that under the native forest soil. With respect to lability of C fractions, proportion of AC pool decreased linearly with increase in plantation age from 59 % under 6 yr to 33 % under 34 yr. old plantations. In contrast, proportion of PC pool increased from 41 % of SOC stock under 6 yr. to 67 % of SOC under 34 yr. old plantations, suggesting the significant role of old aged plantation in C sink management.