

Effects of converting secondary forest on tropical peat soil to oil palm plantation on carbon storage

Abstract

Problem statement: Peat has been identified as one of the major groups of soils found in Malaysia. Sarawak as the largest state in Malaysia has the biggest reserve of peat-land. There are about 1.5 million ha of peat-land in Sarawak, which are relatively under developed. As is the case with any plant, oil palm trees do sequester carbon as they grow. Nevertheless, the process of clearing forest in order to establish a plantation may release carbon. Little studies have been done on the comparison of soil organic matter, soil organic carbon and yield of humic acids when secondary forest on peat soil is converted to oil palm plantation. The objective of this study was to compare carbon storage of secondary forest and early stages of oil palm plantations on a tropical peat soil. Approach: Soil samples were collected from the secondary forest, 1, 3, 4 and 5 year old oil palm plantations in Tatau district, Sarawak. Ten samples were taken at random with a peat auger at 0-25 and 25-50 cm depths. The bulk densities at these depths were determined by the coring method. The bulk density method was used to quantify the total carbon, total organic matter, total nitrogen, humic acids and stable carbon at the stated sampling depths on per hectare basis. Results: There were no significant differences in the amounts of stable C of both secondary forest and different ages of the oil palm plantations at 0-25 and 25-50 cm soil depth. The amounts of stable C in the secondary forest, 1, 3, 4 and 5 year old oil palm plantations at 0-25 cm depth were generally higher than those in the 25-50 cm depth. This was attributed to higher yield of HA in the secondary forest, 1, 3, 4 and 5 year old oil palm plantations soil partly due to better humification at the 0-25 cm soil depth. Conclusion: Conversion of secondary forest on peat to initial stages of oil palm plantation seems to not exert any significant difference on carbon storage in tropical peat soil. © 2009 Science Publications.