Tracing carbon and nitrogen fluxes in soil of log-over forest and highly degraded area of oil palm plantations using stable isotope analysis

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The role of soil organic matter in the world's climate has become the focus of recent studies, particularly with suggestions by the Kyoto protocol that soils may act as a potential sink for CO_2. With approximately 1500 Gt C contained in the upper meter of the world's mineral soils. Changes in climate and land-use will have significant effects on the carbon budget, particularly with respect to the turnover rate of soil carbon. Conversions of tropical forests in to oil palm plantations may effects on the amount of organic carbon in soil and consequently release the carbon into the atmosphere as carbon dioxide (CO_2). For this reason, this study will focus on use of natural abundance level of stable carbon and nitrogen isotopes as tracer of soil organic matter and nitrogen cycling in oil palm plantation with different land history. Furthermore, this work will include identification of relationship between C^{13} and N^{15}abundance in vertical soil profile and also the soil C and N concentration. Later the relationship of stable isotopes and heavy metals concentration which used extensively in this area will also be determined. At the end of this study, the selection of best land for oil palm plantation will be established for better environmental justice.

Keywords: Stable isotopes, Organic carbon, heavy metals, Oil palm plantation, CO_2 emission.