Carbon dioxide balance of an oil palm plantation on tropical peat

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Oil palm plantations have been expanding rapidly over recent decades especially in Indonesia and Malaysia, the two largest oil palm producers in the world. The greatest concern associated with such expansion is its environmental impact. Carbon rich tropical peat swamp forest is also not excluded from such expansion, because it is accessible for developers. Carbon dioxide (CO_2) release through accelerated oxidative peat decomposition is one of the main environmental concerns in the land conversion from peat swamp forest into oil palm plantations, which were drained and compacted to increase yield. Changes in aboveground biomass also might significantly alter the CO_2 exchange dynamics of the ecosystems. Despite the possible significant changes in the CO_2 balance through the land conversion, there is still no study on the ecosystem-scale CO_2 balance of oil palm plantations established on tropical peat. Thus, we have monitored CO_2 flux above an oil palm plantation established on tropical peatland in Sarawak, Malaysia by the eddy covariance technique since 2011. We quantify the annual CO_2 balance of the oil palm plantation and compare it with that of a secondary peat swamp forest in the same region.

Keywords: CO2 flux, Eddy covariance technique, Tropical peat swamp forest, Deforestation, Drainage

