Estimation of GHG emission from different land use changes associated with oil palm plantation

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The release of nitrous oxide (N_2O) from agricultural activities contributes to the increase of greenhouse gases in the atmosphere. In this study, the amount of nitrogen fertilizer used in an oil palm plantation of different stages (immature and mature) was estimated. Data of fertilizing scheme at the oil palm plantation for oil palms varying in age (planted between 1986 and 2009) was used. Estimation of nitrous oxide emission and the resulting CO_2-equivalent emission were calculated for each category of the oil palm. The amount of N-fertilizer applied were between 194-260 kg N/ha. The resulting N_2O emissions were between 2.75-3.13 kg N_2O-N/ha, which corresponds to CO_2-equivalent of between 261.99-346.94 kg CO_2-eq/ha. Despite increase of N_2O emission from immature stage until maturely-developed up to 20 years, there is no clear relationship between N_2O emission per ha and the age of oil palm. Generally, the N_2O emissions found in this study are still low compared to the default value for synthetic nitrogen fertilizer-induced emissions for tropical regions.

Keywords: CO_2-equivalent, global warming, nitrous oxide, N-fertilizer, oil palm plantation