SUMMARY

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The aim to construct the drainage channels on peatlands was to improve the lands for providing the condition of soil water content that can support plant growth. However, this effort promotes the change of the land into an oxidative condition due to decreasing ground water level that is generated. Oxidative condition accelerates the decomposition of organic materials and increases CO₂ emissions from peatlands. The mechanism of CO₂ release from peatlands into the atmosphere is very complex. The objective of this study was to observe the influence of ground water level on the flux of CO₂ emitted from peatlands in oil palm plantations.

Flux of CO₂ can be expressed as the amount of CO₂ concentration that is release from a certain area in a specific period and usually expressed in mg/m²/hour. The analysis was conducted to examine the correlation between the depth of the groundwater and CO₂ flux, as well as study the influence of location in which the flux was measured, peat thickness and peat decomposition degree on CO₂ flux.

Flux of CO₂ produced from peatlands showed varying results. Based on the location, the CO₂ flux from peat under canopy in Sulin-1 and Tanjung Paring was higher than that outside canopy that were 626.49 mg/m²/hour and 1046.34 mg/m²/hour, respectively. However, based on the ground water level, the highest CO₂ flux was 1334.00 mg/m²/hour in Tanjung Paring at 30 cm depth, meanwhile the lowest value was 280.08 mg/m²/hour in Nahiyang-2 at 45 cm depth. Based on the decomposition rate and the thickness of peat, the average CO₂ flux was the highest in the peatland of Tanjung Paring having sapric decomposition degree with the peat thickness higher than 330 cm. In general, the effect of ground water level in peatlands at the study area was not significant on the CO₂ flux during rainy season.

Keywords: CO₂ flux, Peatlands, Depth of Ground Water