Abstract No: A-256

PEATLAND UTILIZATION WITH SECURE AND SUSTAINABLE MANAGEMENT: CASE STUDY IN OIL PALM AND TIMBER FOREST PLANTATIONS IN SUMATRA

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Peatland utilization for plantations requires aerobic condition at the upper peat layer and groundwater level (GWL) conditions at a certain depth to support plant growth while maintaining peat stability. These conditions can be managed by maintaining water levels in the canals. However, it has been claimed that drained peatland introduces oxygen into the peatland surface which then promotes the decomposition of peat materials resulting in carbon (C) emission as an indicator of the degree of peat stability. In addition, drainage of peatland is also thought to influence vegetation cover in certain places which could increase the risk of peat fires. In order to investigate the problems mentioned above, we tried to analyze the use of peatland in relation to three environmental-issues: deforestation, C-emission, and peat fires. The results indicate that peatland utilization for plantations has mostly been expanded into degraded forest and agricultural cropland. Primary peatforest in fact was only used for plantations in a very few cases. More than 70% of plantations have been developed on agricultural cropland and about 28% of them have replaced the previous disturbed peatforest. Moist peat having a water content higher than a critical water content (CWC) could be categorized as hydrophilic peat; in such conditions C-emission and the risk of peat fire significantly decrease. CWC of peat in the upper layer varies from 150 to 270% (w/w) depending on the degree of peat decomposition and the depth of GWL. Maintaining GWL at the depth of up to 80 cm from peat surface is suggested for utilizing peatland with secure and sustainable management.

Keywords: *peatland, sustainable management, groundwater level, peat decomposition*