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SUBSIDENCE RATE OF DRAINED PEAT IN SUMATRA AND KALIMANTAN ISLANDS, INDONESIA

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With land scarcity, more and more peatland areas have been drained and converted to agricultural and other development uses. However, the drainage of peatlands leads to accelerated CO₂ emissions and subsidence which are related to global and local problems. A series of observations of peat subsidence rate was made in the year 2013 to 2015 using permanent, vertical subsidence poles made of 6cm diameter steel poles on peatland that had been used for about five years for agriculture. Each subsidence pole was hammered vertically into the peat profile until it penetrated about one m into the underlying mineral soil layer and about one m of its top appeared above ground. Twenty three subsidence poles were installed at the research sites, i.e. 5; 6; 5; and 7 poles, in West Kalimantan, Central Kalimantan, Riau, and Jambi Provinces, respectively. The changes in carbon content and bulk density were monitored annually for a later estimation of carbon loss. The mean thickness of the peat were 224±27 cm; 379 cm±18; 576±46 cm; and 647±28 cm at the Jambi, West Kalimantan, Riau and Central Kalimantan sites, respectively. The study found that the mean subsidence rate were 3.0±0.4 cm yr⁻¹, 3.7±0.8 cm yr⁻¹, 3.8±1.0 cm yr⁻¹, and 6.4±1.9 cm yr⁻¹, for the locations at Jambi, Riau, West Kalimantan and Central Kalimantan provinces respectively. The results indicate that the subsidence rate was influenced by the distance from the observation points to the drainage canal, and the peat thickness. The closer the observation point to the drainage canal, the deeper the mean water table and the higher the rate of subsidence. The thicker peat tended to subside more rapidly.

Keywords: *subsidence, peat thickness, environmental problems*