

Topic:Greenhouse Gas Balance under Burned and Unburned Sugarcane Plantation in Thailand

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ABSTRACT

Thailand is the fourth largest producer of sugarcane in the world with about 1.22 million hectares of harvested area in 2012. There is currently a significant expansion in the plantation area due to growing internal and external demand for bio-ethanol. At the same time, sugarcane field burning tends to increase for supporting production intensification. This burning is one of the main sources of air pollutants especially particulate matter and greenhouse gases (GHG), and causes the decreasing of carbon stock under sugarcane cropping resulting in change in GHG balance of the ecosystem. However, the assessment of the effects of open burning on emissions and removals still lacks information. As this mention, field survey and questionnaire survey were done to assess the impact of sugarcane burning on GHG emissions in Thailand. The experiment was also conducted to measure GHG emissions/removals under burned and unburned systems.

This study found that about 0.99 million ha of sugarcane are burned in 2012. This represents 77% of the total area of sugarcane harvested. The annual amount of sugarcane biomass consumed by burning is estimated at 5.30 Tg (dry mass basis) leading to annual emissions of 8.44 Tg CO_{2eq}. Furthermore, this finding showed that sugarcane plantation areas are a one potential source for reduction in GHG emissions. The annual GHG balance in the burned area was about -13.35 Mg CO₂ ha⁻¹ and -28.62 Mg CO₂ ha⁻¹ for the unburned area. Sugarcane field burning causes a decrease in the reducing emissions of 15.27 Mg CO_{2eq} ha⁻¹ y⁻¹.

Keywords: Sugarcane, Biomass burning, Open burning, Greenhouse gas, Carbon stock