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Trend of carbon dioxide emission from oil palm plantation in Krabi, Thailand

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Thai government is promoting an alternative resource of energy by producing biodiesel from oil palm as a blend with conventional diesel, with the production goal of 5.97 million liters/day in 2021. Renewable Energy Development Plan of the country has focused on the reduction of import crude oil and the development of low carbon society. For these reasons, the measurement of CO₂ emission is the most important consideration in the policy implementation and planning in order to sustain resource management.

We aimed to analyze a trend of CO₂ emitted from land use change for oil palm plantations in Krabi Province, the greatest suitable area for oil palm growth in the country. We first investigated land use change for a period of 2000-2012 using Geographic Information System, based on data acquired from the Land Development Department, Ministry of Agriculture and Cooperatives of Thailand. Ten land use categories were classified as oil palm, rubber, rice field, coconut, coffee, other agricultures, forest, urban, water, and bare lands. We then analyzed the amount of CO₂ emission from different patterns of land transformation using the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

The result shows that there is no significant increasing trend of CO₂ emission caused by the oil palm expansion in Krabi because most of such expansion is situated on the pre-existing cash crop areas for rubber plantation with no sign of deforestation. Our result provides a basis for supporting the commercial standards of industrial sector and environmental conservation. The conceptual framework of this study can be applied to other areas in the future study.

Keywords: land use change, life cycle assessment, biodiesel, oil plan plantation