

SOIL CARBON DYNAMIC AND REDD CREDIT OF SE TROPICAL ECOSYSTEMS

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The tropical ecosystems have been estimated to be a large carbon source (1.3 Pg C yr⁻¹) due to deforestation and forest degradation, even the global terrestrial carbon sink has been large (1.1 Pg C yr⁻¹) in recent decades. Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for tropical region to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. The ultimate goal of this study is to update REDD mechanism through improved forest management by evaluation of effects of logging and land-use change on soil carbon emission of tropical forests.

This study was conducted in a lowland primary forest at Pasoh Forest Reserve (2°58' N, 102°18' E; 75~150m a.s.l.) and a mountainous tropical forests at Temenggor concession area (5°33' N, 101°36' E; 800~900m a.s.l.) in Peninsular Malaysia. About 50~65% biomass was harvested and soil temperature increased about 3°C with SMS, resulting value of the carbon stock lost about 247 US\$ ha⁻¹ following the first year of logging. On the other hand, under low-impact harvest condition, only about 124 US\$ ha⁻¹ was lost following the first year of logging. Result suggests that this low-impact harvest system would achieve about 123 US\$ ha⁻¹ of REDD credit partially contributed from mitigating soil degradation of about 55 US\$ ha⁻¹.