THE IMPACT OF EXPANDING RUBBER TREE PLANTATION ON SOIL EROSION IN THE MEKONG SUB BASIN.

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Abstract: The rapid expansion of rubber tree plantation has replaced traditional crops and has had consequences for degraded ecosystem and soil erosion. Information about the impact of rubber tree plantation on soil loss is urgently needed for advance protection of the regional ecosystem. The study aimed to identify the expansion areas and its impact on soil erosion occurring under the different age rubber tree plantation. The study area, Huai Bang Sai, Muk Dahan Province, located in Northeast Thailand and covers an area of about 1382 km^2. The objective of this study was to estimate soil erosion as a result of expanding rubber tree plantation with the use of satellite data and the revised universal soil loss equation (RUSLE). We used Thaichote multispectral data and aerial orthophotography acquired in 2012 and 2002 respectively for identifying land cover/land use changes (LCLUC). Supervised method was applied for Thaichote data with B1, B2 and NDVI channel input for the classification to identify LCLU and the rubber tree plantation area. On screen digitizing method was used for the aerial orthophography to derive LCLU. We applied the RUSLE model to estimate soil loss under different LCLU types Each of the RUSLE factors was established and spatially overlaid using GIS.

Increase in rubber tree plantation from 0.419 percent in 2002 to 11.891 percent in 2012 was found from the two images used. The finding indicates that no significant difference in soil loss between young/middle rubber trees and traditional field crops (cassava and sugar cane) which accounted for 25-45 ton/ha/year. Decrease in the severity of soil loss was found for the mature age rubber tree with rating of 5-10 ton/ha/year. Due to soil erosion resulting from the interaction of the RUSLE factors, the rubber tree cover contributes the soil loss for lesser extent than those of slope gradient factor and ecological forest cover. Information obtained providing both spatial and quantitative soil losses including LCLUC can be used for advance protection of ecosystem.

Keyword: Soil loss, rubber tree plantation, Mekong sub basin.