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Spatial pattern of forest and land cover change in jambi province (Sumatra, Indonesia) form 1990 to 2011

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Forest and land cover in Jambi province are quite dynamic with a significant amount of forest decrement. Transformation of the land in Jambi province has been triggered mainly into plantations to cultivate palm oil, rubber, and timber and smallholder rubber agroforestry. Having knowledge about forest and land cover change is important for further study to understand the driving factors of land use and land cover change, particularly the cause of deforestation and forest degradation. As the intensity and the spatial pattern of the land use change could be different for the both study areas considered in the CRC 990 (Bukit Duabelas and Harapan landscapes), this hypothetical dissimilarity may explain some differences between the two considered landscapes particularly on the factors affecting the changes. This study examined the spatial pattern forms and driving factors of land use change at the landscape level in the study area. The objectives of this project are (1) to study the spatial pattern and fragmentation of land use change, particularly forest change, in the transformation systems of Harapan and Bukit Duabelas National Park, and compare it with the general trend for the whole Jambi province in the last 21 years; (2) to produce a time series of LULC maps for the study area with the forest and land cover classes considered in the transformation systems experimental design of the CRC 990 / EFForTS project: secondary forest, oil palm plantation, intensive rubber plantation and extensive rubber (jungle rubber); and to study the effect of land use change on the aboveground biomass carbon stocks in the study area in the last 21 years. The works performed in this study includes: (1) Compilation of both the historical forest and land cover maps from the Indonesian Ministry of Forestry and time series of Landsat images for each acquisition date; (2) Image processing and correction to get a nearly cloud free mosaic for each acquisition date; (3) Visual interpretation of processed Landsat images based on corrected land cover maps (4) Study of the spatial pattern of land use change (5) WP5. Evaluation of land use change on carbon stocks. The study found that there is significant land use and land cover changes occurred since 1990 to 2013 having typical spatial pattern. From in-depth interview, it was also found that the driving forces of land use changes are mainly due to development of estate crop by both local community and big estate companies.

Keywords: land use and land cover changes, spatial pattern, driving forces, time series data, and multi temporal analysis.