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Spatio-temporal analysis on land transformation in a forested tropical landscape in Jambi Province, Sumatra

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Land use/land cover (LULC) in forested tropical landscapes is very dynamically developing. In particular, the pace of forest conversion in the tropics is a global concern as it directly impacts the global carbon cycle and biodiversity conservation. Expansion of agriculture is known to be among the major drivers of forest loss especially in the tropics.

This is also the case in Jambi Province, Sumatra, Indonesia where it is the mainly expansion of tree crops that triggers deforestation: oil palm and rubber trees. Another transformation system in Jambi is the one from natural forest into jungle rubber, which is an agroforestry system where a certain density of forest trees accompanies the rubber tree crop, also for production of wood and non-wood forest products.
The spatial distribution and the dynamics of these transformation systems and of the remaining forests are essential information for example for further research on ecosystem services and on the drivers of land transformation.

In order to study land transformation, maps from the years 1990, 2000, 2011, and 2013 were utilized, derived from visual interpretation of Landsat images. From these maps, we analyze the land use/land cover change (LULCC) in the study region. It is found that secondary dryland forest (on mineral soils) and secondary swamp forest have been transformed largely into (temporary) shrub land, plantation forests, mixed dryland agriculture, bare lands and estate crops where the latter include the oil palm and rubber plantations. In addition, we present some analyses of the spatial pattern of land transformation to better understand the process of LULC fragmentation within the studied periods. Furthermore, the driving forces are analyzed.