Spatial and temporal assessment of driving and conditioning factors and their impact on land use / land cover change in the Xiangxi Catchment, Three Gorges Region

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Land use / land cover change (LUCC) is the most important human alteration of the earth's surface and is primarily studied in cases where it leads to severe environmental problems.

The construction of the Three Gorges Dam on the Yangtze River in China has an extensive impact on the ecosystems and the local population. To assess its impact, the Xiangxi Catchment is taken as an example. The outlet of the Xiangxi River, a northern tributary of the Yangtze River, is located about 40 km upstream of the Three Gorges Dam. Due to the loss of fertile arable land and residential land which is mainly induced by the inundation and measures of resettlement, enormous LUCC is observed in the study area by depicting the land use / land cover by classification of LandsatTM data retrieved in 1987 and 2007. LUCC in the Xiangxi Catchment during this period can generally be characterized as decrease of cultivated land, increase of woodland and fallow land, and a shift in cropping from traditional smallholder farming to the establishment of citrus orchards, which are implemented as cash crops.

Not only the inundation and the resettlement have an impact on LUCC, also the newly built and improved traffic infrastructure, growth of urban structures and land use policies in terms of environmental protection are expected to play an important role concerning LUCC. To assess the spatial and temporal impact of influencing factors, a LUCC gradient is generated based on post-classification change analysis of multispectral data. Furthermore, inter-stages between 1987 and 2007 have to be examined, to reach for a higher temporal resolution, which shall help to figure out temporal relationships between LUCC and the occurrence of driving factors. Once influence factors and and their spatial and temporal impacts are identified, a basis for predicting LUCC in the future for is provided for this area.