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Linking Land Use / Land Cover Changes with Socio Economic Data to Set up Scenarios for a Sustainable Development Plan

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Abstract

In many areas in Africa there are fast changes of the land use / land cover. For a sustainable land management it is important to have information about the spatial patterns and the speed of the changes. As well there must be an sound understanding of the underlying processes and actors of the LUCC. Based on that information it is possible to set up scenarios for future development and estimate the impact of development measures like building roads on the land use / land cover.

This paper presents recent work which is done in the semi-humid tropics in Benin. The area of investigation is the catchment of the Upper Ouémé in Benin which has an area of around 100 km × 100 km. In the last decades there are strong changes of the LUCC due to growth of the population, migration and logging activities. The pattern and the speed of the LUCC where derived by analysing multi-temporal LANDSAT TM and ETM images taken since 1986 up to now. Assessing the anthropogenic LUCC in the semi humid tropic is not an easy task. The problem is to differ human long term changes from the natural changes in vegetation due to the change of wet and dry season or the impact of bush fire. Using advanced change detection methods like change vector overcame that problem.

To identify the driving forces and the actors of the therewith derived LUCC the change patterns were linked with socio-economic data. Official census data supplemented with own, more detailed, census served as input. With comprehensive GIS and statistical analyses it was possible to build up a regional model to describe the LUCC for the test area. With this model scenarios for future development under different boundary conditions can be computed. This is an important step for the set up of a sustainable landscape management plan.

Keywords: Benin, change detection, land use and land cover change, modelling, remote sensing, West Africa

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