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## Remote Sensing as a Tool for Investigating Vegetation Dynamics in West-Africa

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### Abstract

Within the last decades there is dramatic change in the land use / land cover (LUCC) in West-Africa recorded. Growth of population, climate change, exhausted soils and refugees from countries with civil war put pressure on the ecosystems. Decision makers need precise information about the LUCC and the underlying processes to set up management plans for an sustainable development. Within the IMPETUS project remote sensing was utilised for investigate the LUCC in two catchments north (Morocco) and south (Benin) of the Sahara. With Remote Sensing the needed information can be gained for great spatial units even for areas which are not easy accessible.

Vegetation dynamics within the semi humid tropics has different temporal scales. There are the inner seasonal vegetation dynamics due to the change of wet and dry season. On the other hand there is the long term change of land cover and land use caused by human impact or long term climate change. The assessment of actual vegetation cover in parts of Benin and Morocco was done by analysing recent LANDSAT 7 ETM+ scenes in a resolution of 30 m. Therefore an advanced knowledge based classification method was developed. Intensive ground truth campaigns backed the classification.

Inner seasonal vegetation dynamics were investigated with LANDSAT 7 ETM+ scenes showing different stages of the vegetation within an annual phenological cycle. Additionally SPOT VEGETATION satellite data provide every day information of the vegetation for whole Africa in a resolution of 1 km × 1 km. Merging the different data sources increases the knowledge of the vegetation dynamics in the areas of investigation. The long term changes of the land use / land cover were assessed with historic remote sensing data of different spatial resolution. Therewith it is possible to derive the pattern and the speed of the LUCC. Now this information is linked with socio-demographic data to understand the processes of the LUCC and to set up scenarios for further development. Based on that scenarios the decision makers can set up management plans for a further sustainable development.

**Keywords:** Benin, remote sensing, vegetation classification, West Africa