Assessing the impacts of Land Cover Change on Surface Water Sources in Southwestern Nigeria: The Role of Communities' Local Experts

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Land cover change (LCC) is essential for land use planning and crafting adaptation measures to global change including global warming, natural hazards, land degradation and socio-economic dynamics on the local to global scales. In this study, we investigated whether water stress in the woodland savanna and rain forest zones of Southwestern, Nigeria as observed by the rural communities' local experts' can be used to evaluate LCC in the region. LCC was conducted using orthorectified Landsat multi-temporal imagery for 1970/1972, 1986/1987, 2000/2001 and 2006 using maximum likelihood classification and change detection techniques. The results showed a decrease in the forest area and an increase in built-up and cultivation/others (open space, bare land, grassland) areas. Between 1972 and 2006, forest reduced by about 50% while built-up areas increased by about 300%. A social survey (Participatory Learning Approach PLA) involving local experts between the ages of 50 to 70 was conducted to assess their observations in the region on (i) LCC and (ii) the causes of water stress, and (iii) the associated risk and adaptation/recommendation. The communities' local experts are generally reported that changes in climatic condition (e.g. decreasing rainfall), continuous deforestation in the last 30 years and diversion of rivers and streams into surface storages (earth dams and reservoirs) are the major factors responsible for water stress and scarcity in the region. There is thus, a good correlation between the results of remotely sensed data of LCC assessment and the communities' local experts' observations of land cover changes and changes in surface water resources in the region. The study therefore inferred that LCC map products could be used in a participatory approach involving the communities to assess the impact of environmental change on an important service of ecosystems such as fresh water resources.