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Remote Sensing Based Study on Land Use / Land Cover Change in a High Populated Region in Bamileke Highlands, Cameroon

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Abstract

The study investigated the land use/land cover change (LULCC) and its driving forces in the Bamileke highlands in West Cameroon in Central Africa using a remotely sensed derived dataset, expert knowledge, official statistics and data collected in the field. The aim of the study was to detect LULCC over the period of 1959–2001 and analyse the link between LULCC and socio-economical conditions such as population growth, population distribution, and cultural behaviour of the population. The analysis based on interpretation of the informations derived from population census statistics, analogue topographic and morphologic maps and Landsat imagery. On one hand, in order to retrace the LULCC from the years 1959 to 2001, we visually interpreted two topographic maps from 1959 and 1961 as well as a Landsat MSS image from 1978. On the other hand, we carried out an automatical classification of multispectral Landsat images from the years 1988 and 2001. We tested different techniques of classification and obtained the best results by application of Maximum Likelihood algorithm to informations extracted from Principal Components of Landsat channels. The results revealed a clear change in the land use/land cover over the study period. The direction of the change and its magnitude vary between different land cover types. The highest change magnitude is associated with forest area. It decreased by 8.3 % alone during the period 1988–2001, the decrease of this land cover class during the whole period of 50 years was so enormous that at many localities a fully disappearance of large forest areas was proofed. The rapid decrease of forested area is caused by deforestation in advantage to the cultivated land and settlements. The areas enlargement of these both land cover classes was driven by a rapid population growth and the change of the cultural behaviour of the population in the study region. The results of the study provides a better understanding about the nature of the LULCC in the rain forest belt in Africa and exposes its environmental and anthropogenic driving forces.

Keywords: Cameroon, deforestation, LULCC, remote sensing