

# **Spatiotemporal Variability of Land Use and Land Cover in the Abaya-Chamo-Basin, Southern Ethiopia since 1981**

- Poster -

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The main aim of this paper is the description and evaluation of climatic and vegetational trends in the Lake Abaya-Chamo-Basin over the last 20 years by applying trend analysis to the normalized difference vegetation index (NDVI) and climatic time series. The results are correlated and compared over different spatial and temporal scales.

The Lake Abaya-Chamo-Basin covers an area of around 18,100 km<sup>2</sup> and is located in Southern Ethiopia within the East African Rift Valley. It is characterized by strong topographical differences over short distances between the rift floor, the slopes and the tertiary basaltic highlands. These characteristics influence the expected tropical climate, soils, natural vegetation and, consequently, population distribution. The natural vegetation consists of savannah-type and deciduous woody vegetation on the rift floor and the lower slopes and afro-montane forests on the upper slopes and the highlands. Agriculture is dominated by mixed farming systems integrating crop and livestock production.

The main reason for interannual variations of rainfall and the NDVI series is the Pacific El Niño/Southern Oscillation event which reaches Ethiopia with a time lag of a few months. Dominant effects are rainfall shortages resulting in local droughts of varying intensity. The NDVI values are correlated with rainfall, hence, vegetation is also dependent of ENSO. Furthermore, the Mt. Pinatubo eruption in 1991 which ejected Sulphat aerosol and dust into the atmosphere has a strong influence. As a consequence, a diminution of the solar radiation which is responsible for photosynthesis occurs which in turn causes a strong decrease in the NDVI value. The tropical temperatures are without major influence.

In most cases, the comparison of climatological and vegetational trends shows a weak relationship. Moreover, the influence of the different landscape units is only measurable pertaining to climatic differences between rift floor and highlands, but not regarding soils or natural vegetation. The main cause of the extent of negative trends during the decade between 1991 and 2001 anthropogenic factors, mainly the high pressure caused by rapid population growth (especially along main highways), and poor agricultural conditions. Human pressure is the biggest threat for the Lakes Abaya-Chamo-Basin ecosystem, i.e. the expansion of urban and rural settlements and agricultural areas onto marginal sites (e.g. steep slopes) as well as an intensification of currently used areas. Consequently, natural vegetation decreases and the risk of land degradation and surface loss increases.