



Tracing grassland degradation on the Eastern Tibetan Plateau with multi-temporal remote sensing data

Fabian E. Fassnacht (1), Li Li (2), and Andreas Fritz (3)

(1) Institute of Geography and Geoecology, Karlsruhe Institute of Technology, Karlsruhe, Germany, fabian.fassnacht@kit.edu, (2) Wildlife Ecology and Management, University of Freiburg, Freiburg, Germany, li.li@wildlife.uni-freiburg.de, (3) Remote Sensing and Landscape Information Systems, University of Freiburg, Freiburg, Germany, li.li@wildlife.uni-freiburg.de

The Tibetan Plateau in Western China is the world's largest alpine landscape, sheltering a rich diversity of native flora and fauna. In the past few decades, the Tibetan Plateau was found to suffer from grassland degradation processes. Grassland degradation is assumed to not only endanger biodiversity but also to increase the risk for natural hazards in other parts of the country which are ecologically and hydrologically connected to the area. Grassland degradation is furthermore, changing the albedo of the surfaces of the Plateau and may therefore even notably affect atmospheric and climatic processes. However, the mechanisms behind the degradation processes remain poorly understood due to scarce baseline data and insufficient scientific research as well as manifold potential influences on the degradation processes including pastoral management, climate, herbivore mammals and administrative decisions.

This study tries to contribute to this research gap by tracing grassland degradation processes by time-series analysis of multi-spectral Landsat data. After identifying the degraded areas, it is examined whether the degradation patterns relate to topographic properties, climatic gradients or administrative borders.

Results from a first study showed that most degradation occurred in high-altitude areas, while slope and aspect were not having a notable influence. Furthermore, a climatic gradient within the study area was found to correlate with the degradation patterns observed for large extents.

Currently, the study is being expanded over a larger area and more detailed spatially-adaptive analysis concerning the degradation drivers are being developed. Corresponding results will be presented. We conclude that remotely sensed patterns of grassland degradation can contribute to an improved understanding of the degradation processes on the Tibetan Plateau by providing spatially and temporally explicit information on the degradation processes at an adequate scale.