



Historical aerial photographs and archives to assess environmental changes in Central Africa

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The conversion of natural lands into human-dominated landscapes is a major component of global environmental change. Assessing the processes of land use and land cover (LULC) changes and possible future scenarios through the lens of coupled human-natural systems is of paramount importance if we are to embed sustainability in development strategies, ecosystem management, and land use planning, particularly for developing countries where rates of LULC changes are highest.

To quantify and understand the complexity of changes and subtle modifications in LULC, an accurate account of past LULC conditions and recent changes over a multidecadal time scale has an important added value. However, sufficiently long, multidecadal records of LULC changes are almost inexistent for the least developed areas of the globe. Here we propose to make use and valorise the Royal Museum for Central Africa (RMCA)'s unique collection of historical aerial photographs (and other archives). These photographs are an important archive that has the potential to reveal key information on the state of the environment at the mid of the 20th century.

The general objective of this project (called PASTeCA) is to evidence the importance and the added value of aerial photographs and archives from RMCA to support present-day environmental change studies in target tropical environments of Central Africa. The focus of the environmental topics relies on the spatio-temporal dynamics of LULC changes. The project deals with land occupation and demography, land degradation, geohazards, and slope process issues. The first specific objective is to produce digital products of the historical photographs and archives that can be used for LULC studies in general. The second specific objective is to explore the causes, impacts, scales and trends of the LULC and its changes in the context of environmental degradation with the help of these digital products. The third specific objective is dedicated to improve accessibility of digital products derived from historical photographs, archives and LULC changes for both the international scientific community and the public at large to foster their exploitation.

In order to carry out the project, research is focused on a study area located in the western branch of the East African Rift. The region extends from the North Tanganyika rift zone in the south to the Virunga Volcanic Province in the north. Its LULC evolution is interesting to study because of the combination of various natural and human characteristics (i.e. high population densities, border between countries, diversity in landscape, recent land degradation, various conflicts, urban sprawl, numerous occurrences of landslides, very active volcanoes, highly dynamic rivers, etc.). For the region of interest, most questions related to LULC and the changing environments remain unclear and research outputs will be directly relevant to society. It is hoped also that the new knowledge that this project will bring will not be limited only to a local and regional perspective. It is expected that PASTeCA brings insight of the core basics that explain the studied environmental processes in general so that it serves for other assessments in many other places too.