



Tropentag, September 16-18, 2015, Berlin, Germany

“Management of land use systems for enhanced food security:  
conflicts, controversies and resolutions”

## Streamflow and Lake Water Level Changes and their Attributed Causes in Eastern and Southern Africa

MEIKE PENDO SCHÄFER<sup>1</sup>, OTTFRIED DIETRICH<sup>1</sup>, BONIFACE MBILINYI<sup>2</sup>

<sup>1</sup>*Leibniz Centre for Agricultural Landscape Research (ZALF), Institute of Landscape Hydrology, Germany*

<sup>2</sup>*Sokoine University of Agriculture, Tanzania*

### Abstract

Over the last century, changes in the water balance of river basins have been observed in many African countries, often resulting in water scarcity. Agricultural development hereby often has a direct impact on basin water resources. On the other hand, sufficient water availability is a pre-condition for sustained agricultural production and food security.

The presented review was conducted in frames of the BMBF funded Trans-SEC project (FKZ: 031A249A). It aims at compiling information on water resources development in Eastern and Southern Africa over the past century, and systematically analysing the obtained data base for patterns, trends and correlations between the nature and quantity of the described changes, as well as the attributed reasons.

The findings indicate that anthropogenic actions, foremost land use change and water abstractions for agriculture, are the primary drivers of change in drainage basin water balance and commonly associated with increased runoff and flooding as well as decreased dry season flow. The described pressures in Eastern and Southern Africa are mainly driven by population growth, whereby the vast majority of agricultural activities are conducted by small-scale subsistence farmers. Already, conflicts between the use of scarce land and water resources are evident, which are often further amplified by the expanse of irrigated cash crop and intensified food crop cultivation.

The regions with the reportedly most intense changes and highest number of water conflicts comprise the northern Rift Valley, and an area stretching from Lake Victoria and the Southern Rift Valley region towards the Indian Ocean coast in Tanzania. With respect to the sustainable enhancement of food security, colliding stakeholder interests here need to be gauged against the limits of available natural resources, underlining the need to diligently consider agricultural development strategies in regard to the available natural, and especially water, resources.

**Keywords:** Agricultural development, climate change, floods, land use change, water resources, water scarcity