



## **Analysing the hydrological processes in a sub-humid tropical headwater catchment – field investigation, model modification and model application**

**G. Steup** , S. Giertz and B. Diekkrüger

Department of Geography, University of Bonn, Meckenheimer Allee 166, D-53115 Bonn

To analyse the future effects of global change on hydrological processes and water availability process-based models are required that are able to represent the hydrological processes and thus are appropriate for scenario analysis. Until now most hydrological models have been applied and validated in the temperate climate zones, while in the tropics only few investigations concerning hydrological modelling and hydrological processes were carried out. Therefore a detailed analysis of runoff generation processes and its influencing factors is necessary to prove the applicability of the models in a tropical environment and to calibrate and validate them.

Within the GLOWA IMPETUS project (an integrated approach to the efficient management of scarce water resources in West Africa) the effects of global change on the hydrological cycle are examined in two different catchments in West Africa (Morocco and Benin). In two small headwater catchments with different land use in a sub-humid tropical area of Benin discharge, infiltration capacity, soil water dynamics and other soil physical properties were measured. These measurements permit an analysis of the hydrological processes and provide data for the parameterization and validation of a physically-based model, which was adapted based on the process analysis. With a multi-criteria validation (discharge, discharge components, soil water dynamics) an evaluation of the process representation of the model is realizable.

The presentation will show the dominant hydrological processes of the investigated catchments and the results of the multi-criteria validation. The applicability of the modified model concept in the area of investigation will be discussed. Comparison of measurements and simulation results reveals that further modifications are required.