



Geomorphic and Hydrological challenges in Africa: implications for soil and water conservation

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Expected scenarios of climate change and population growth confront Africa with various important challenges related to food, water and energy security. Many of these challenges are closely linked to the impacts of soil erosion and other geomorphic processes, such as reduced crop yields, sedimentation of reservoirs and reduced freshwater quality. Despite the urgency and extent of many of these challenges, the causes and dynamics of these processes and their impacts remain severely understudied. This becomes apparent when the availability of e.g. soil erosion and catchment sediment export measurements for Africa is compared to that of other continents. Nonetheless, a substantial amount of geomorphic research has been conducted in Africa. Many of this work dates back from several decades ago, and were often only reported in 'gray literature' (e.g. internal reports). Here we present an overview of our current state of knowledge on soil erosion and its implications in Africa. We discuss which geomorphic process rate measurements are currently available and what can be learned from these with respect to the challenges raised above. We especially focus on our current understanding about the effectiveness of soil and water conservation techniques at various spatial and temporal scales. Based on specific case-studies (e.g. in Ethiopia and Uganda) and a meta-analysis of previous work, we highlight some research gaps, research needs and research opportunities when aiming to use Africa's soil and water resources sustainably and efficiently.