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Bridging the gap between local and continental studies: Up-scaling local vulnerability patterns of small-scale farmers to water security to the African continent

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Water and food security implies various aspects like the availability, affordability and the access to those natural resources. Improving water and food security requires therefore integrated assessments because they are embedded in complex human-nature interactions. Coping strategies must be site specific and problem oriented to be effective that's why local information is indispensable. Food and water security has a spatial, social and temporal dimension. Water resources in a region are internally generated and can originate (temporarily) from external resources via inflow or import as virtual water. Water provisioning involves then its affordability (e.g. financial means) and access (e.g. infrastructure). It is therefore subject to various inter-dependencies and competitions. Water and food security is often expressed in vulnerability terms if it e.g. refers to characterize specific social groups. Vulnerability is an interdisciplinary and multi-scale construct which integrates exposure, sensitivity and adaptive capacity as basic components. Sensitivity and adaptive capacity are mostly internal features of a study area and their residents. However, they are exposed to processes which can occur on various scales.
In the following a framework is presented to characterize vulnerability patterns of small-scale farmers to water security in Africa. The focus here lies more on water security as food provisioning is very much determined by water availability.
Five meso-scale case studies in Africa are compared in terms of their site specific and overall human-nature cause and effect relationships. The case studies are rural sites which cover a range of eco-regions. Different social groups already experience a high competition for natural resources. The case study contexts were analyzed through participatory integrated assessment tools. Multi-scale social and biophysical driving forces were identified which impact on NR management for water and food provisioning. They are used to derive underlying mechanisms which are up-scaled to the African continent in order to identify vulnerability patterns of small-holder farmers to water security. Aggregated information on socio-economic drivers, climate variability and external dependencies in the form of upstream-downstream interactions are integrated.