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Hydrological connectivity, vegetation and erosion : examples from two African landscapes

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In this study we discuss the role of erosion processes for two selected case studies in Africa. We especially would like to emphasis how hydrological and erosional connectivity is affected by semi-natural and agricultural related vegetation patterns. We selected a case study from an intensively agriculturally used semiarid region of Burkina Faso, and another case from a slightly more humid abandoned shrubland invaded area Eastern Cape province in South Africa.
In both areas soil degradation is strongly affected by current and past land use which has a high impact on runoff generation and erosion patterns. We used high resolution image analysis, as well as ground observations and data to analyze the differences in connectivity and hydrological response for both areas. Soil physical parameters covering essential soil properties such as crusting, erodibility and infiltration were measured.
We found in both areas that vegetation pattern and hydrological connectivity analysis, as combined with soil surface properties, enabled us to distinguish different landscape zones with characteristic responses and that the coupling of subsequent downslope zones, with different responses, was determining the actual response on a landscape scale. This has important consequences as such an approach can be used to pinpoint erosion hotspots that may facilitate a dedicated approach to reducing adverse impacts on on site-soil quality and off site degradation and sedimentation effects.