



Developing Eastern Africa's resilience to flood and drought through multi-functional ecosystem-based management strategies

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The rapid urbanization and agricultural expansion of Eastern Africa puts people in direct conflict with nature. Nowhere is this more obvious than for water resources where the delicate balance of too much water (flood) or too little water (drought) is a matter of life and death for millions. This work tackles this apparent conflict head-on by considering ecosystem service trade-offs relevant for water-based disasters as populations transition from rural to more intensive agricultural/urban lifestyles. Specifically, recent work from the Kilombero Valley of Tanzania, a region which has been targeted for development investment but where potential impacts (not to mention sustainability) associated with various development scenarios remain largely unresolved, will be presented as relevant case study. Our efforts on modelling and data synthesis for this region have shown promise as we seek to advance science in more and more remote (and in particular developing) regions while allowing important improvements for management of less and less available resources. Thus, in spite of large uncertainties the work highlights how research may still provide an improved system understanding of resource flows even when working under less than perfect conditions. Subsequently, such understanding feeds into development of frameworks for quantifying socio-hydrological impacts of land-water management. To ensure relevance regionally, we consider Kilombero Valley in the context of existing nature-based approaches dealing with disaster risk reduction. Such context potentially facilitates transfer of knowledge across country borders. Our goal here is to empower planners and stakeholders throughout the region by helping translate their knowledge into optimized adaptation strategies and linking their experiences through South-South transfer. There remains an open (and fundamental) question of how to best define management recommendations and activities that not only achieve climate resiliency but also are acceptable for stakeholders without compromising ecosystem service supplies.