



Sustainable water use and management options in a water-stressed river basin in Kenya

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Sustainable water resource is critical for maintaining healthy ecosystems and supporting socio-economic sectors. Hydro-climatic change and variability, population growth as well as new infrastructure developments create water security risks. Therefore, evidence-based management decisions are necessary to improve water security and meet the future water demands of multiple competing sectors. In this work we perform water resource modelling in order to investigate the impact of increasing water demand (expanding agriculture, booming industry, growing population) on the sustainable water use in Turkwel river basin, located in arid north-western Kenya. We test different management options to determine those that meet the water demands of the concerned sectors whilst minimising environmental impact. We perform scenario analysis using Water Evaluation And Planning (WEAP) model to explore different ranges of climate conditions, population growth rates, irrigation scale, reservoir operations, and economic development. The results can be used as a scientific guideline for the policy makers who decide the alternative management options that ensure the sustainable water use in the basin. The work is part of the REACH - improving water security for the poor program (<http://reachwater.org.uk/>), aiming to support a pathway to sustainable growth and poverty reduction