

Hydrological Response to Predicted Land Cover Change in the Upper Shire River Catchment, Malawi

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ABSTRACT The problem of water shortage and competition is getting increased attention in the field of water management. Good quality ground and surface water may become too scarce to allow for sustainable use for various functions. With increasing human activities, it is important to understand interactions between hydrological regimes and associated land use, and land cover change in the catchment. This paper reports the use of the Soil and Water Assessment Tool (SWAT) model to develop an approach for modelling and evaluating potential impacts from future land use and land cover change on the annual and seasonal water balance of the Upper Shire River catchment in Malawi. The results indicated that by 2020, groundwater recharge in the Upper Shire sub-catchment would decrease by 21–31 percent and stream flows by 35.7 percent due to the future reduction of woodlands and increase in agricultural land. The proposed approach provided a quantitative description of the main environmental impacts vis-à-vis hydrological processes arising out of rural land-use change at the river-catchment scale, which can be used when planning for sustainable land and water resources management.