



Simulating the impact of climate and land use change on water availability of selected river basins in Africa

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In order to develop a clearer understanding of the complex interactions between water and land on the continental and global scale it is vital to gain new insights about the adequacy of water resources for future food production, and conversely, about the impact of expanding agriculture on regional water availability. In this study, the land-use change model LandSHIFT and the global hydrology model WaterGAP are soft-linked to quantify the relationship between landuse/landcover in Africa and the continental-scale water balance. WaterGAP is used here to compute the terrestrial water balance for a number of African river basins versus the amount of water abstracted from water systems in the different sectors, manufacturing, households, irrigation and electricity production. Simulations are carried out for current as well as GEO-4 scenario conditions, considering land cover change as modelled by LandSHIFT, and climate change as well as socio-economic changes. The results show that the change in river discharge is dominated by the projected climate change, in particular by the change in precipitation. Anthropogenic water abstractions, however, differ regionally and can significantly alter the water budget. Therefore, they have to be assessed in detail.