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The potential impact of climate change on water balances of five catchments within the Blue Nile Basin for different scenarios of land-use

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The objectives of this study are i) to assess the potential impact of climate change on the water balance of five catchments in the Blue Nile region and ii) to evaluate how water stress, concerning its duration and severity, in different scenarios of land-use might be affected. Water stress was defined as a condition when soil moisture content is below wilting point for the crop type dominating in a certain land use. We used the conceptual precipitation-runoff model HBV. Weather data for present climate were retrieved from nearest synoptic meteorological stations of the National Meteorological Agency of Ethiopia and for climate change scenarios downscaled using the ECHAM5 scenarios. As references scenarios of the water balances of the catchments Birr, Upper-Didesa, Gigel Abbay, Koga, Megetch for present climate conditions were used the parameterizations of the fifty best parameters sets. These were found by using river flow data for the period 1991-2004 and the Generalized Likelihood Uncertainty Estimation (GLUE) technique for calibration (see presentation by Gebreyohannis Gebrehiwot). Land use was characterized by two crop factors, the potential evapo-transpiration and the wilting point. When different land-uses occurred within a catchment, the different values of two crop factors were weighted in proportion to these different land uses. Preliminary results will be presented of the water balances for present and climate change conditions with focus on the potential change in severity and duration of water stress for different land-uses. The Swedish International Developing Aid (Sida) funded the project.