

Annemieke Gärdenäs, Solomon Gebreyohannis Gebrehiwot, Per-Erik Mellander, Jan Seibert, Kevin Bishop and Woldeamlak Bewket

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

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. Different degrees of water stress were defined using the ratio of the actual to potential transpiration and different land use were characterized by potential evapotranspiration. The four catchments are Birr, Upper-Didesa, Gigel Abbay and Koga; they range in size from 260 to 1800 km². 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 Mellander et al. 2012. Annual average temperature ranged from 16 to 20 °C and precipitation from 1560 to 2010 mm in present climate. We used an adjusted version of the conceptual precipitation-runoff model HBV (Seibert, 1999). The parameterizations of the fifty best parameters sets of the water balances of the catchments for 1995-2005 by Gebreyohannis Gebrehiwot et al. 2012 were used as references scenarios. 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.