



Climate change impact on water resources in the Awash basin, Ethiopia

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The Awash basin, located in Ethiopia, is one of the highly utilized river basins with continuing rapid growth of agriculture, industries and urbanization, and at the center of the countries poverty alleviation and economic growth strategy. The ever increasing population will require more agricultural outputs and drinking water supply. In a basin known for high climate variability involving droughts and floods, climate change will intensify the existing challenges. To quantify the potential impact of climate change on water availability (computed as precipitation minus evapotranspiration) of the Awash basin in different seasons we have used a number of climate models from Coupled Models Intercomparison Project phase 5 (CMIP5) and for three consecutive periods (2006-2030, 2031-2055, and 2056-2085). The models were selected based on their performance in capturing historical precipitation characteristics. The baseline period used for comparison is 1981–2005. The future available water is estimated as the difference between precipitation and potential evapotranspiration projections using two representative concentration pathway emission scenarios (RCP4.5 and RCP8.5). The climate change signal from the climate models are transferred to the observed data. The middle and lower parts of the basin show water deficiency in all seasons in the historical period. The projections for the future three periods show increase in water deficiency in all seasons and for parts of the basin. This is mainly due to projected increase in potential evapotranspiration and decrease in precipitation in some parts of the basin. This decrease in water availability shows water stress in the basin and a risk of water security for the different sectors, which are currently increasing their investments in the basin. This calls for an enhanced water management strategy that is inclusive of all sectors and the poor.