Impact of possible future urbanization on local climate in Tanzania

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Future changes on land use/land cover (LULC) due to urbanization may cause variation in the frequency or severity of extreme weather events and alteration on local climate with potentially worsening impacts. Most of natural disasters in Tanzania are related to changing climate and are associated to recurrent floods and droughts. This study examines the local climatic impacts allied with projected urban expansion through simulated rainfall and temperature over the coast of Tanzania. Simulations were conducted using dynamical downscaling approach on a 4 km resolution grid, owing ability to account for local scale features such as LULC and complex terrain. Global Forecasting System Model (GFS) coupled with mesoscale Weather Research and Forecasting model (WRF) was used on recent urban land cover and the projected 2030 urban changes during rainfall season in April 2018. Evaluation for sensitivity study were carried out using model output against in-situ measurements from the Tanzania meteorological station network and satellite data. The preliminary results from the sensitivity simulation demonstrated good skills of the model to simulate rainfall of Tanzania. Regarding, spatial and diurnal cycle of projected urbanization show an increase in precipitation intensity and significant changes in rainfall distribution. More outcomes on temperatures changes over urbanized areas are expected to be shown in future analysis. The findings indicate the necessity for strategically designed and future planning of the region. Also, has highlights the climate change impacts which can be intensify by rapid urbanization.

Key words: Urbanization, WRF, Climate change, Dynamical Downscaling, Rainfall, LULC