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Study of the Performance of a Regional Climate Model in Simulating Rainfall in Rwanda

High resolution models were used for simulating rainfall in Rwanda. But each model should be evaluated before using its output to assess impact. The ability of Regional climate model (RCM) was evaluated using RegCM4-7 which is driven by the MPI-M-MPI-ESM-LR to simulate rainfall over Rwanda. The model output was compared to observation to simulate rainfall in Rwanda through assessing the model performance. Bias, root mean square error (RMSE) and Pearson correlation were used to assess model skill while Mann-Kendall (MK) was used for trends analysis.

It is found that model performance in simulating rainfall both seasons over Rwanda, overestimates rainfall in October-November-December (OND) season over all part of country with positive biases but much more to north and South-West and Underestimates in March-April –May (MAM) season over the Central and Eastern part of Country with Negative biases and model simulates rainfall over the country better with less errors in MAM than OND season.

The future projection of rainfall with two scenarios RCP2.6 and RCP8.5 for near future period (2021-2050) and far future period (2051-2080) for 30 years were used and they show that the average rainfall will increase in western and Southern party of the country while a greater changes projected during OND and less in MAM under both scenarios and Periods.

Overall, the study finds that RCM used is able to simulate rainfall climatology in Rwanda with better performance and suggesting the potential use of in further similar studies.

Primary author: BAZAMBANZA, Alexis

Presenter: BAZAMBANZA, Alexis

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