

Summary

Understanding and confidence on climate change and its potential impacts have grown greatly over the last few years. While the evidence for climate change grows stronger, uncertainty prevails over the precise nature of these changes and their impacts at local and farm level. This study evaluates the climate variability and change in past, current and future climate in five countries in the East African Community (EAC), namely Kenya, Tanzania, Uganda, Burundi and Rwanda using high resolution regional models under the Coordinated Regional Climate Downscaling Experiment (CORDEX). Trends of mean variability was determined using graphical, regression and Mann-Kendall test approaches for the past (1970-2000), current (2001-2014) and projected future climate change scenarios (Representative Concentration Pathways - RCPs - 4.5 w^m-2 and 8.5 w^m-2 for mid (2041-70) and end (2071-00) century. Over EAC, most of the models are inconsistent in representing spatial precipitation distribution. However, the study notes that ensemble precipitation from CORDEX well represented the rainfall climatology over EAC. Temperature fields are well represented by all the CORDEX models and the ensemble. The study notes that multimodel ensemble mean outperforms the results of individual models in most of the areas and time periods as assessed for both precipitation and temperature fields. Precipitation remained highly variable both in space and time. Temporal pattern of rainfall over EAC had a strong inter-annual rainfall variability associated with extreme events such as floods and droughts. Climate variability and change is expected to result to adverse macro socio-economic implications especially in agriculture and thus affect the livelihoods of populations in the region. Adapting to these changes will require the knowledge of their frequency and severity. Therefore, there is an urgent need for realistic adaptation options aimed at reducing the vulnerability of the environment, wildlife and human and support economic systems to cope with the consequences of recurrent climate extremes, variability and climate change