Past and Projected changes in Rainfall and Temperature over East Africa

Victor Ongoma, PhD
South Eastern Kenya University
Email: victor.ongoma@gmail.com
Introduction

- Why rainfall and temperature?
- Rainfall and temperature seasonality and trends.
- Climate change indicators in EA
- The problem statement and relevance of the study
Observed Rainfall and Temperature variability over East Africa based on CRU data, 2051-2010

**Rainfall**

Rainfall (mm)

\[ y = -0.87x + 1024.2 \]

**Temperature**

Temperature (°C)

\[ y = 0.02x + 22.7 \]
Decadal Anomalies

MAM Rainfall

(a) 1950s
(b) 1960s
(c) 1970s
(d) 1980s
(e) 1990s
(f) 2000s

JJA Temp

(a) 1950s
(b) 1960s
(c) 1970s
(d) 1980s
(e) 1990s
(f) 2000s

Decadal anomalies, relative to LTM, based on CRU data, 1951-2010
Performance of CMIP5 Models

- Most CMIP5 models overestimate (underestimate) OND (MAM) rainfall
- Similar results, CMIP3 - Anyah and Qiu (2012), CMIP5 - Yang et al. (2015)
Monthly modeled rainfall climatology (1961-1990) & projection (2071-2100)

Seasonal & annual change (2071–2100 minus 1961–1990) in rainfall
• Rainfall change relative to the baseline period 1961–1990
• Analysis is based on ensemble mean for CanESM2, CESM1-CAM5, CNRM-CM5, CSIRO-Mk3.6.0, MIROC5
UNFCCC’s target to limit temp. increase within 1.5 - 2 °C above pre-industrial levels, ....is it possible?
As researchers or practitioners what are the possible interactions/collaboration with practitioners resp. researchers to improve/upscale your activities

- Diagnostic studies on GCM performance.
- Regional Climate Modelling.
- Multi-disciplinary collaborations; risk, vulnerability and impact assessment calls for multi-disciplinary approach.
What are the potential aspects of the research that can be transformed into practice?

- Devising effective adaptation measures to effects of climate change.
- RCM - Increased time resolution of climate products _ Extreme climate events.