Review of: "Precipitation and Temperature Trends over the Lake Tana Basin, Ethiopia"

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Potential competing interests: No potential competing interests to declare.

Review report on Precipitation and temperature trends over the lake Tana Basin, Ethiopia

This study applies a systematic literature review to describe trends and variabilities of Precipitation and temperature in the Lake Tana basin in Ethiopia. The study focuses on historical and future projected trends. The subject is topical, given the significant impacts of climate change and variabilities in Africa. Nevertheless, I have suggestions to make the review more exhaustive.

1. The authors cited studies that reported opposite directions (decreasing vs increasing) of the precipitation trends in the same area. The authors should present a synthesis of possible causes of the contrasting direction of the trends. This could result from different statistical approaches of calculating the trends e.g MannKendall statistic, Spearman's rho, graphical and Onyutha's method (Onyutha, 2016; 2021). Differences in the trends may result from the presence of serial auto-correlation in the time series dataset that may bias the calculation of the trends (Muthoni et al., 2019). It is best practice to test if serial auto-correlation exists in the time series before calculating the trends, which many studies ignore.
2. The authors should examine the presence of temporal changes in Precipitation and temperature. The total amount of Precipitation can remain the same for a year but still, with a significant temporal shift (Dunning et al., 2016) that can significantly affect the timing of cropping calendar activities such as sowing and harvesting of crops. There are significant shifts in rainfall onset and cessation dates of rainfall in the horn of Africa.
3. The authors mentioned climatic extremes but are not included in the review. It is important to review a number of the 27 precipitation and temperature extremes indices as specified by the **Expert Team** on Climate Change Detection and Indices (ETCCDI; http://etccdi.pacificclimate.org/indices.shtml).
4. Monitoring climate change in Africa is primarily hindered by low density of observation network and significant data gaps in existing gauge stations (Dinku, 2019). To address this, researchers are increasingly using satellite-based estimates of temperature (e.g. CHIRTS, ECMWF-S5, TerraClimate) and Precipitation (CHIRPS, CHELSA, TAMSAT, WorldClim) to complement the sparse gauge network. The authors review studies utilizing gauge stations despite a large body of literature utilizing validated satellite-based estimates of Precipitation and temperature. Local knowledge of climatic trends is an important source but not addressed in the current review. Many studies have recognized the importance of farmers' perceptions on the trends of the climatic extremes in Ethiopia, including the Lake Tana Basin (Darabant et al., 2020).
5. It would be better to combine results and discussions to avoid unnecessary repetition.

6. The conclusions can highlight the possible impacts of the observed changes in precipitation and temperature extremes on different economic sectors. Note that even if Precipitation does not change significantly, significant warming trend could accentuate water loss through evapotranspiration.

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