Review of: "Analysis of climatic parameters in the upper Awash River basin of Ethiopia"

Boris Komitov

Potential competing interests: No potential competing interests to declare.

The subject of the above mentioned study is a statistical analysis of the main climatic parameters (temperatures and rainfalls (precipitations) in an separate region of Ethiopia (the Awash River Basin) during the last ~ 30 years, namely for the calendar interval 1991 - 2020 AD. The corresponding data from the National Meteorological Agency of Ethiopia has been used. These data (time series) has been studied by using of linear regression for existence of possible statistically reliable trends. As an additional task a similar study for some basic and typical for Ethiopia (climate depending) crop agro products yield also has been provided. The main analysis is focused on the “residual” series (the deviations from the obtained linear regression models).

The study is provided accurate and in good faith. The obtained results and their analysis seems reliable. The used data series are too short, only 30 years and I think that this is a weakness for this study. The more qualitative climate statistical studies need to use essentially longer time series (better as longer). May be there are no data for longer time intervals in the past (!?...)

However, it need also taken into account that the study has been provided, as it is noted by the author, without any financial support. This could to explain why the obtained results are based only on linear regression analysis and the corresponding discussion is, by my opinion, relatively poor. On the other hand such studies for the tropical regions of the north from Equator placed part of Africa which climate is often affected by extreme drought and hot episodes are very useful if even when they have weakness as the above mentioned ones. That’s I think that the paper is appropriate for official publication in the current form. The English seems enough good, but it is not my native language and I am not a language specialist.

NOTE: There is double using of symbol in the plots for the rainfalls in Fig.2, 3 and 4. Symbol “R” is used both for the correlation coefficient and for the rainfalls. Please, change the symbol “R” for rainfalls with any other symbol – for example “P” (precipitations) or any other one.

Some additional recommendations for further developments and improvements in the course of this theme are given below:

1. Using of longer meteorological time series for temperatures and/or precipitations (if such data series exist and the author has an access to them).
2. My row visual checking over plots shows that the years with local extreme minimal/maximal temperature, precipitations and crop yields are not occasional and correspond to 11-year Schwabe-Wolf's solar activity cycle extremes. Thus the existence of cycles by duration of 10-11, 20-22 and 5-6 years, where have analogs in space climate (i.e in the solar and/or geophysical activity) is very possible. This hypothesis is supported by studies, which have been already provided during few decades ago in the middle of 20th century for the hydrological regime of the largest African rivers (Neil and Congo) where 11-year oscillations has been found (see for more details *in Herman J.R. and Goldberg R., 1978, Sun, Weather and Climate,NASA Sci and Technology Inf.Branch*, and/or *Hoyt D.H and Schatten K.H., 1997, The Role of Sun in Climate Changes, ISBN 0-19-509414-X*, electronic edition; https://library.uniteddiversity.coop/Climate_Change/The_Role_of_the_Sun_in_Climate_Change.pdf). It should be very interesting and useful to compare results regarding the space climate influence over the East African climate changes before and after 1990 AD.
3. In summary I have a strong recommendation to the author to investigate the climate changes in Ethiopia no only during the last decades but also during the earlier times with taken into account the space climate influence factors. Any conclusions and/or predictions based only on the last 30-40 years with high probability could occur very speculative.

Boris P. Komitov, PhD