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

Víctor Soto[1]

1 Universidad Veracruzana

Potential competing interests: No potential competing interests to declare.

In principle, it is remarkable to know the climatic conditions that occur in the African continent, which contributes to the knowledge of the global climate. It is important to mention that, although the increase in temperature throughout the planet is widely documented, it cannot be considered as an absolute condition, since in mountain systems there are microclimate conditions that also cause the temperature to behave somewhat stable and even, in some cases, that it has tendencies towards a slight decrease (Soto et al. 2020). For its part, it is not strict that precipitation has a decreasing trend as the author has pointed out; but on the contrary, many regions have been favored or affected, depending on the point of view given, with a gradual increase in accumulated rainfall or wet periods. Therefore, there is evidence that, in mountain regions and upper parts of some basins, spatial variations in precipitation concentration have been recorded throughout the year (Soto et al 2022). The remarkable thing about the case is that the African continent has medium and high mountain areas, which suggests the existence of some of the above situations, above all, that the work area exceeds 4000 meters above sea level. Therefore, it is necessary not to generalize the conditions of increase and decrease of temperature and precipitation, respectively, as mentioned by the author, at least in the initial part of the work.
I agree with the author when he mentions the existence of interannual and interseasonal climate changes on the African continent, since these patterns have manifested themselves in different magnitudes on a planetary scale. At the same time, I highlight the author's mention of the need to study climate variability in detail as a product of climate change; the latter strengthens what was stated in principle about the microclimates present in mountain areas.

It strikes me that the author performs his analyzes with data from 1991 to 2020, perhaps seeking to work with the new climatological normals; however, because at planetary scale, the task of preparing climate time series usually takes several years of work, I doubt that by 2022 there will be reliable data series for the study period; therefore, considering this, the results found must be taken into account with great caution due to the margin of uncertainty caused by the use of non-homogeneous series. I recognize the author's intention to pretend to show the new climate patterns for his study area, however, it is mandatory to point out in his study that the reported findings are the product of preliminary data, or at least, they would correspond to provisional climatological normals, such as it is mentioned in the World Meteorological Organization (WMO, 2018).

With respect to the methods applied, the author places great emphasis on justifying the value or statistical significance of the results but does not mention anything about the quality of the data. I consider that to give greater strength to the work,

it is necessary to deepen the description of the series used and how the data was managed to convert them into homogeneous series; that is, it must be indicated for each station used how many years and months of data are complete, how many are not, how the data gaps were filled, etc., since it is from these series that the indicated products have been obtained. Another factor that would help to better understand the variability of the climate in the study area would be through the analysis of one or more of the most representative isotherms throughout the time of the study (Soto et al. 2022), to graphically show the increase altitude of this isotherm and better understand its impact on the surrounding ecosystems. I also consider it appropriate to point out if there is any type of correlation between the precipitation pattern found and the phenomena of interannual variation at the regional level, since there is evidence that ENSO also affects regions of Africa (Zermoglio et al. 2019).

Perhaps the discussion of the results deserves a more in-depth analysis. It would be advisable for the author to relate his findings to frame them in the current context of the African climate and the world climate in general. But especially, analyze the implications that these changes have on water resources, food security, at the level of ecosystems, etc. That is, beyond comparing the results with those of other works, it is necessary to interpret the findings for the benefit or detriment of the populations (humans and ecosystems) that depend directly on climate conditions for full development.

The combination of the previous suggestions would help to further strengthen the work, which is important as indicated above, and at the same time would give it a greater ease of understanding of the local and regional climate changes in the African continent, which as commented at the beginning, it is of great scientific importance since it enriches the knowledge of the current climatology of the planet and of regions close to the tropics, which, as has been shown, have a higher level of risk in the face of the consequences of the changing climate of our days.

References:

Soto, V., Yoshikawa, K., & Schörghofer, N. (2020). Climatic variation in the high-mountains of central Mexico: temperature and precipitation indices at Nevado de Toluca volcano. *Atmósfera.* https://doi.org/10.20937/ATM.52768

Soto, V., Alanís, JL., Pech, JM., & Chagoya, JL. (2022). Distribution and spatio-temporal variation of temperature and precipitation in Sierra de Otontepec Ecological Reserve, Veracruz, Mexico, through GIS modeling. *Atmósfera.* https://doi.org/10.20937/ATM.53124

WMO. (2018). Guide to Climatological Practices. WMO-100. World Meteorological Organization. Geneva, Switzerland, 128 pp.

Zermoglio, Fernanda & Scott, Owen & Said, Mohammed. (2019). Vulnerability and Adaptation in the Mara River Basin. 10.13140/RG.2.2.20540.49282.