

## **Propagation from meteorological to hydrological drought in the Horn of Africa using both standardized and threshold-based indices**

The study analyzes the propagation of meteorological drought to soil moisture and hydrological drought and their influencing factors in the Horn of Africa (HOA) covering Kenya, Somalia and Ethiopia and consisting of 338 catchments. In this study, the authors present a variety of gridded datasets for analyzing droughts at a monthly level during the period 1980–2020, including MSWEP precipitation, GLEAM soil moisture and GloFAS streamflow. As a first step, they calculate the standardized and threshold-based indices and examine propagation from one to another.

The main contribution of the paper is its effort at proposing a methodological framework, while relying on well-known approaches and methods. I suggest some improvements detailed below. I hope my comments can contribute to enhancing the quality of the paper.

### **Major comments**

- The first thing I would suggest to the authors is that they carefully review the text to avoid several grammar errors and typographical errors prevalent in the manuscript (I list some of these errors at the end of the review as examples).
- Studies have developed and used a wide range of meteorological drought indices. Could authors briefly explain why they selected/prefer SPI over other indices?
- Authors did not explain/mentioned how they identify drought events based on these standardized indices (onset and termination of drought events). Since these standardized indices encompass both droughts and non-drought periods.
- Is there any particular reason for having different interval classes in Figure 1b? If not, then I would suggest that the class interval and color scale be changed with distinct colors for the classes.
- Figure 2: The authors mentioned two drought characteristics i.e., duration and severity/deficit volume. However, the entire paper focuses exclusively on the duration of the drought. Therefore, it is recommended that the severity/deficit volume analysis be added or removed from Figure 2.

### **Minor Comments**

- It is preferable to have different color boundaries for the countries so that the location of each country can be identified immediately.
- Figure 2: The resolution of the figure is quite low
- I believe this paragraph should be placed in the introduction rather than on lines 124-132
- Lines 209-211: It is appropriate to provide these results as supplementary information.

## **Typos and English grammar (examples)**

- Line 15-16: “and by calculating the ratio between the threshold respectively streamflow drought duration”. The use of respectively is not clear, please rephrase
- Line 425: We find differences in propagation from precipitation to soil moisture to also be influenced by ....
- Line 509: repetition of the sentence (As such, the dataset tends to overestimate streamflow in arid and semi-arid areas).