

Interactive comment on “Impact of precipitation and increasing temperatures on drought in eastern Africa” by Sarah F. Kew et al.

Sarah F. Kew et al.

sarah.teulingkew@gmail.com

Received and published: 1 July 2019

We approach this study from an attribution science perspective. We acknowledge that the reviewer might not be familiar with this approach. It is therefore obvious that our approach needs to be better explained for the general reader. The reply below concerns the most important issues raised here (1. title/topic of analysis, 2. awkward presentation) to stimulate discussion and aid the rest of the revision process. We will produce a full point-by-point response and additionally address all minor issues when the interactive discussion is over.

1. THE ANALYSIS IS ON LONG-TERM TRENDS RATHER THAN DROUGHT

It is known that eastern African temperatures are increasing in step with global warm-

Printer-friendly version

Discussion paper



ing. The objective of the paper is to determine if increasing temperatures are exacerbating long-term agricultural drought, i.e. are annual-time scale droughts increasing in frequency and intensity as the temperature increases? And/or are there human-induced changes in the annual (lack of) precipitation that have more explaining power than local temperature in increasing drought severity? To answer these questions, we indeed assess trends (with respect to GMST) in drought indices. There are various definitions of drought and we explain that we analyse changes (in frequency/intensity) to agricultural drought, which is normally measured by the state of the soil, soil moisture. The title is therefore, in our opinion, not incorrect. We will, however, make explicit from the start that the paper is about long-term drought.

2. MATERIAL IS PRESENTED IN A WAY THAT MAKES IT HARD TO FOLLOW

We intend in our revisions to improve the presentation by:

* Stating more clearly that we will use an attribution approach to study agricultural drought in eastern Africa.

* Explaining clearly what we mean by an attribution approach and, in the methods, describing the steps involved which serve the final goal: arrive at one synthesized statement for each region. The steps contain: (i) the definition of the regions over which spatially and annually averaged time series are analysed (see Sect. 2.1), (ii) the detection of trends in observations with respect to GMST, accompanied by the calculation of a return period of a specific event threshold, (iii) model evaluation, (iv) calculation of trends in the models and (v) synthesis of the results. We will make clear that it is only in order to illustrate the method that we show some of the intermediate results in the methods section, whereas the synthesis results (the actual results of the study) are shown in Sect. 4. It will then be clear why, for example, we examine trends in GMST rather than in time, and do not map the results.

* Moving some topics from the introduction, as proposed by the reviewer e.g. removing discussion-like material and information on food security from the introduction to the

[Printer-friendly version](#)[Discussion paper](#)

discussion/elsewhere.

* Clearly giving the motivation for choosing a particular structure to present results (why we first present synthesis diagrams region by region, and then comment on variable by variable).

* Clearly stating where examples are illustrative and not intended as results in response to the research question (sec 3.2). On a similar note - in section 4 (Synthesis of results) making clear that the text applies to all regions, not just region SS which is used as an illustrative example.

* Including a table as suggested to summarise the data sets used. We think preference for a table or a figure is personal (some people we consulted prefer to view the information in a figure), so propose to keep the figure in the main text and add a table to the supplementary, which can include additional information such as time periods available.

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2019-20>, 2019.

Printer-friendly version

Discussion paper

