

Black text: Reviewer #3.

Red text: Response by the authors.

The authors use a well-known method to give an overview of drought research topics and their development over time. While the method is not new, I find the results and the added thoughts by the authors to be of interest to the research community.

In order to make a topic model research overview interesting and relevant the analysis needs to go beyond reporting and interpret the conclusions for the research community. The authors do this very well. For example, I really like the discussion on including plant genetics into future yield prediction in Section 3.2. My only criticism would be where these interesting discussions currently happen. At the moment these very relevant findings and interpretations are hiding at the end of the individual results sections and are only briefly picked up in the discussion section. I would recommend a clearer split between results and discussion, meaning that e.g. Lines 191 to 196 should be part of the discussion, not the results. Same with other paragraphs. E.g. the discussion around missing topics in L156 to 164 then repeats in L301 to 306.

Thank you for your positive evaluation of the manuscript. We appreciate your time and effort in reviewing the manuscript.

We agree that the paper will benefit from restructuring. We will henceforth move discussion points from the results section to the discussion section, which is where they belong to.

The discussion section on drought resilience frameworks makes an important point (L308). But at the moment it feels more like an afterthought. It could, for example, already be introduced in the introduction as a motivation for a drought research overview and then elaborated more in the discussion.

Thank you. We will stronger integrate drought resilience frameworks already in the introduction and motivation.

Minor points:

L18: Please already mention that the generative model you are using is LDA, e.g. “using a generative model (topic model)”, as for some people that term will be more familiar.

As suggested, we will mention LDA already here.

Introduction: Please expand on the motivation for this study. The first three paragraphs repeat well-known information that summarises why drought is a relevant topic. This could be shortened into one paragraph. And then the introduction should introduce the motivation for this specific analysis. Why do we need an analysis of drought research topics? (relevant for drought resilience frameworks?). What is the problem with past drought reviews? (Too many publications to humanly read? (Stein et al, 2022)). There are a lot of bad scientometric reviews out there. What makes this one different?

We will expand on the motivation for this analysis thereby address the questions pointed out.

L64: Scopus is not the largest database (see <https://help.openalex.org/coverage> for a comparison).

Thank you. We will name other databases for scientific literature and remove that Scopus is the largest one.

L70: "LDA did cluster" is a strange grammar. Consider rephrasing.

We will rephrase the sentence.

L96: The description of the methods repeats here. Consider shortening.

We will remove the repetition of methods from results section.

L129: Can you add a range? How many papers did the smallest/largest topic include?

We will include ranges in the text.

L133/140: This might be an editing problem, but there should not be a paragraph break between these two, as the thought continues. In the next line.

We will move the positioning of the Figure to fit the flow of content.

L152: It would be good to see which topics the author classifies as impact, event and methods related. I would this categorisation also helpful in structuring Figure 6. However, I would understand if a clear categorisation for some topics is difficult.

We will more prominently point to the classification detailed in Figure 3. We will also consider to add the classification in Figure 6 axis labels.

L161: A keyword search across the articles might give an indication which of the two explanations are true.

We will consider the keyword search in the revision and report the findings in case they are meaningful.

Section 3.2. I think the labels for Figures A and B have been switched for the entire section.

Well observed. We will switch the cross-references to Figures A and B accordingly.

Figure 5/6. The upper triangle of the plot only mirrors the lower triangle. Consider removing.

This is correct. We considered removing. However, it makes the figure more accessible, if the labels are sorted by overall similarity and scores can be read line by line, with full cross-reference to the second axis labels. Hence, we suggest to keep both triangles.

L213: Can you elaborate on the surprising geomorphology and water use efficiency connection? In what kind of research do they overlap?

We will identify and explain the overlap for both topics.

L235: This is the only discussion I did not really like. It sounds a little bit like you are advocating for interdisciplinarity for interdisciplinarity' sake, which I do not agree with. Plus you are only looking at

abstracts. A full-text analysis will likely reveal the specialised research to be more interdisciplinary as well.

We will note that a full-text analysis will likely reveal stronger overlaps.

We will also better explain why interdisciplinarity is crucial for drought research. Here we will stronger draw on the results of the study, the widths of topics in research affected by water scarcity, and the competition and limitation of water resources availability – in particular during drought periods.

Section 3.4. The low numbers of drought research in North America are surprising and need to be checked. The US is always a major contributor in previous research distribution analyses (e.g. Emmer (2018) and Callaghan et al, 2021). Particularly for drought research, I would expect a lot of research with the megadrought in California in recent years.

This is surprising, indeed. One reason is the volume of research funding in North America. In contrast to Emmer 2018, we did not attribute geographic location based on (co-)authorship affiliation. We have chosen a similar approach as Callaghan et al. (2021) by using geographic information i.e. country names and for USA federal state names to assign geographic context. We will check again the consistency, point out this surprising finding in context to additional references and findings, and elaborate potential reasons in the discussion.

L306: Is it possible that the diversity of terms in use for these topics might prevent a clear topic (e.g. compound vs multi-hazard vs hazard cascade...)?

The strength of LDA is that it uses all words within a document for analysis. While we cannot exclude terminology to play a role in topic formation, it is always a number of keywords rather than few which form the context and a single topic. We will add this in the discussion.

Callaghan, M., Schleussner, C. F., Nath, S., Lejeune, Q., Knutson, T. R., Reichstein, M., ... & Minx, J. C. (2021). Machine-learning-based evidence and attribution mapping of 100,000 climate impact studies. *Nature climate change*, 11(11), 966-972.

Emmer, A. (2018). Geographies and scientometrics of research on natural hazards. *Geosciences*, 8(10), 382.

Stein, L., Mukkavilli, S. K., & Wagener, T. (2022). Lifelines for a drowning science-improving findability and synthesis of hydrologic publications. *Hydrological Processes*, 36(11), e14742.