

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1  
<https://doi.org/10.5194/nhess-2021-152-RC1>, 2021  
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## Comment on nhess-2021-152

Anonymous Referee #1

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Referee comment on "A geography of drought indices: mismatch between indicators of drought and its impacts on water and food securities" by Sarra Kchouk et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-152-RC1>, 2021

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In this well-written manuscript the authors conduct a bibliometric analysis of papers that mention drought indices and water and food security concerns. The topic is interesting and meaningful. Furthermore, the methodology applied is robust, and the final outputs of good quality. Nevertheless, the title, abstract and introduction promise something bigger as they only mention "drought impacts". Forestry, energy, livestock and other impact types are ignored. The focus of the study should be clearer in the title and abstract. Another problem is that the results were not validated. There are many limitations that derive from using such a word frequency approach and they should be acknowledged in the limitations section. Furthermore, the discussion section should be deepened. Therefore, I suggest a major revision.

### Major comments

- The authors should emphasize that only impacts related to water security and food security are considered. This should be very explicit in the title, abstract, introduction and discussion. This limits considerably the scope of the paper as impacts related to forestry, energy security, transport and even tourism are disregarded. Furthermore, this results in a bias in the outcome regions with a higher number of studies. E.g. if forestry was considered, I think there would be more studies in EUA and Europe
- Line 99: It should be further stressed in the introduction that a country comparison was conducted. I think the way the search was done can introduce biases. It could be that a studied investigated, West African countries for instance or that it investigated the Tyrol region or it could also be that just the name of a City/state were mentioned and not the country itself.
- I would suggest making a correlation between the number of driver studies and the

number of impact studies. You could either have a plot or a table with this for different countries or for different regions. This way we can visualize better the existing ratio. This will help to support your discussion. This could be used instead of Figure 4

- Section 4.1, besides the descriptive analysis, I think a more critical judgment is needed here. What are important indices that are hardly applied? Why they are hardly applied?
- The discussion in 4.3 is directly related to 4.1 I would suggest to join them.
- A main limitation is that the definition of drought impact is very narrow. Important studies related to forestry in Europe and USA were completely ignored, for instance. In the recommendation section, it would be beneficial to add that future studies could look into impacts for other sectors. Examples of papers that give a good overview of potential impact types that could be investigated include:

<https://iopscience.iop.org/article/10.1088/1748-9326/aba4ca>

<https://nhess.copernicus.org/articles/16/801/2016/>

- A further limitation is that you work only with word frequencies. It could be that many of the impacts or indices are just mentioned in the abstract, but that the study does not really investigate it. For example, it could be that the abstract says "research is needed to help us understand food security". You could perhaps manually validate part of the abstracts and see what is the percentage of papers that fall into this category. In any case, this limitation should be clearly stated.
- Here you try to link drivers and impacts by using simple linear approach. There are some quite interesting studies that actually try to link these data. I suggest adding a paragraph to the discussion session regarding the linkage of the physical aspects to the socio-economic ones. Some suggestion of studies that could be used to write this paragraph include:

<https://hess.copernicus.org/articles/20/2779/2016/>

<https://www.nature.com/articles/s41467-019-12840-z>

<https://iopscience.iop.org/article/10.1088/1748-9326/10/1/014008/meta>

## **Minor comments**

- Line 68: What is meant by “categorized” geographic areas?
- Line 75-76: The sentence is not clear. Metrics for what? Do you mean for selecting which indices were going to be reviewed?
- Table 1: please mention that this top 3 areas are retrieved from scopus
- The Soil Moisture Index (SMI) is missing from the agriculture indices, or is it related to other of the mentioned indices? Please check. Here some references:

<https://iopscience.iop.org/article/10.1088/1748-9326/11/7/074002/meta>

<https://hess.copernicus.org/articles/18/2485/2014/>

- Line 81-95: This information should come before the table 1
- Figure 1: It is not possible to read some of the classes in the figure.
- Line 122: I do not think there is a significant difference. For me they follow all the same pattern with some minor differences. “exceptions are Australia-Oceania and Sub-Saharan Africa, where AD indices are most frequently reported”. Can you add confidence intervals to the plot?
- I am not convinced of using the acronyms MD, AD, HD. The terms “meteorological drought”, “agricultural drought”, etc are not so long, and I think it would be better for the reader to use them instead of MD, AD and HD
- Figure 2: If you opt to use the acronyms, it would be useful to add (MD), (AD), (HD) to the Figure. The acronyms are new and if you repeat then in the figures it makes it easier to read the text without needing to come back every time at the first time they were mentioned.
- Line 140: Again, I am not convinced of the use of SSA and similar acronyms. I had to go back in the text multiple times.
- Figure 4: it is a nice plot, but does not add any new information. I suggest adding it to the supplementary material. I think this figure could be substituted by one where you show the ratio of driver vs impact studies.
- Figure 1: I like the innovative visualizations, but I think a traditional choropleth map would convey information in an easier way
- Line 360: I would change “countries” by “regions”, as for most of the analyses you aggregated the data.
- Line 413-414: I do not think the results showed that “Our results revealed that drought is mainly depicted through a conceptual lens”. I would remove the conceptual lens part as you have just focused on a word frequency and have not analysed the papers in detail
- Line 358-363: This is not a limitation. The first sentences could be moved to the discussion above. The last sentences are a lot of speculation that should either be removed or backed up by other research