

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1
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Comment on nhess-2021-278

Anonymous Referee #1

Referee comment on "Validating a tailored drought risk assessment methodology: drought risk assessment in local Papua New Guinea regions" by Isabella Aitkenhead et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-278-RC1>, 2022

The study intends to cover themes that usually receive not enough attention or are often overlooked, i.e. small islands and early warning systems at relatively local level.

The sections are slightly unbalanced. The introduction could be more concise. However, the specific goals of the study should be explained with more clarity therein. Limited room is given to results, whilst the discussion goes again in length, where it could be more concise (e.g. explanation of the 2014 anomaly).

There are some issues in the article, which are discussed in some more detail below.

- A problematic methodological choice is related to the very short "historical" period selected, of only seven years. The period should be extended to gather stronger evidence for the validity of the methodology.
- Especially with the impossibility of extending the period of analysis, a sensitivity analysis to enhance the evaluation and validity of the risk index is highly recommended
- The paper starts highlighting SIDS as a special feature of the work, something that would give it added value, but in reality it does not explicitly address SIDS, and the methodology could be assumed to be suitable for e.g. any inland continental area.
- In order to be used for I-EWS, risk analysis should ideally provide some predictive capability, but the methodology relies on data that are unable to provide that. Furthermore, the analysis at province level lacks resolution to be considered for a proper User centred I-EWS.
- Results seems rather weak and the validity of the methodology for actual application at local level is not proved.

Below some more detail:

Line 1 (title and abstract): Most people outside Oceania will not get what PNG refers to. The use of acronyms in the title is not recommended, but if unavoidable at least in the abstract it should be explained.

Line 35: please add a reference for the sentence

46-47: suitability is indicated as a key concept, but it is not explained well, I could not understand its definition from this sentence.

61: the four components seem actually five?

68-70: a citation could be useful for this

119: what would be the most "efficient" methodology, what means efficiency in this context?

129: "preciseness of this method has been criticised" requires the reference to such criticism.

157: typo "scare" instead of "scarce"

201-209: the goals of the study are not very clear from this paragraph, which needs to be revised and rephrased, e.g. there is an apparent mixed use of "hazard" and "risk", "hazard event" is unclear (line 204), it is a bit redundant, etc.

235: the range 2014-2020 seems very short and recent to be called "historical"

247-250: The rationale for the selection of hazard, vulnerability and exposure indicators from the text and the appendix is not emerging properly. Whilst the availability of data is an unavoidable limiting factor, the combination of the indicators selected seems a rather "casual" one and replaceable in many different ways. Therefore, a more sound justification and thorough explanation should be provided, or proper references, or, in the case the selection was data driven post-hoc, this should be stated and explained.

258: make sure to use "index" and "indicator" consistently and appropriately throughout the paper

260: "historical and current" is not clear to what time range they actually refer to

263-265: The choice of VHI is limiting the time span of analysis from 2014 onwards only, which is a drawback of this study. There are other products for vegetation with longer time series, why not using any of those? Especially because the weight given to VHI for hazard calculation is relatively small.

283-284: "Thresholds [...] were adapted" please add a bit more info on how they were adapted. Also, it states "Once indicator variance was confirmed", what does that mean?

294-295: the use of mean value from such a short "historical" time series to indicate the midpoint seems unreliable. Can you really state that is the best option?

324: "Null 2021" is lacking from the references

327: How is it formalized, the link between impacts reported by sources and the three severity classes?

335-338: what exactly are you testing statistically here? Cannot figure out

340: It is not explained how the 3 levels of severity are translated into the 4 levels of risk used also by the assessment, for the comparison. Please clarify

345-350: it is good and common practice to report the results of such tests in synoptic tables, whether in the main documents or in the annex.

TABLE 2: no mild risk levels are displayed for any of the provinces in any year, basically. This is of concern, not just because it may diminish the informative value of the indicator, but especially because it looks like the risk has not been calibrated at its best. Now, it can be the case where calibration is fine, but the short range of years under analysis do not help to figure out, nor the risk components are presented separately to provide some hints (is it driven by hazard? Is it systematic high vulnerability? Etc.). Furthermore, given the somewhat arbitrary decisions taken to elaborate the risk index, a sensitivity analysis

would enhance greatly the value of the results.

354: rather moderate-severe, than mild-moderate, looking at the table.

405 and following: as stated also in the introduction, El Nino/Nina and IOD are indicated as drivers of drought in PNG, but they are completely ignored in the hazard component of the risk assessment. This should be explained or at least mentioned in the discussion.

519-520: with indicators looking at 3 months cumulated values, it is unlikely that informative value would have been gathered enough in advance, as expected by an EWS. It is also probable that hazard variables may have sufficed in that regard, at province level.

Figure 1 and 2: scale bar is lacking, please add

APPENDIX A: vegetation health index is indicated as meteorological indicator, but it is not. It is remote sensing and used for vegetation/agriculture. Access to safe drinking water is listed under Exposure, but it is unclear why, as well as Elevation