

RESPONSE TO REVIEWERS (egusphere-2025-5704)

Review article: Multi-Hazards and Household Preparedness Planning: Evidence, Gaps and Opportunities

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[RC1] Anonymous Referee #1

[RC1a] In the manuscript “Multi-Hazards and Household Preparedness Planning: Evidence, Gaps and Opportunities” the authors perform a literature review to assess the extent to which multi-hazard thinking is integrated in to studies of household preparedness following the Principles of Preparedness, by Sutton and Tierney (2006). The authors find that there is a geographical bias towards the Global North in studies of household preparedness. They also find that the majority of the literature does not make explicit references to how multiple hazards interact to shape preparedness strategies. I think this paper is well embedded in the literature of disaster preparedness and that it could be valuable contribution to this literature. However, some revisions are required for the article to be suitable for publication, see my points below.

[Response to RC1a] – Thank you for taking the time to provide a constructive review for this work. The comments provided are helpful and we agree will strengthen the paper.

[RC1b] Text:

Check line 201 “(See Figure 3.Fig.3.)” ‘

Check line 456 (space missing between “11but”

[Response to RC1b] We will check correct these errors.

[RC1c] Methodology The authors state that after analyzing 138 of the 587 papers the ‘the researchers reached the thematic repetition point of data saturation’. Could the authors elaborate on how these 138 papers were selected out of the 587 papers in total? A further elaboration on how these papers were selected (for example through random sampling) could for example strengthen the claim of geographical bias in these studies.

[Response to RC1c] Articles were sorted by relevance to the key terms on Web of Science (WoS), and analysed in that order (In lieu of any existing theoretical framework to sort the papers). Titles and abstracts of the remaining papers were also briefly consulted to help make the decision about saturation. We will outline the Web of Science sorting process in more depth in the revision. In the revision we will also elaborate more on the criteria for meeting thematic saturation, citing key literature on this. For example:

Saunders, B. et al. (2018) ‘Saturation in qualitative research: exploring its conceptualization and operationalization’, *Quality & Quantity*, 52(4), pp. 1893–1907. Available at: <https://doi.org/10.1007/s11135-017-0574-8>.

Tracy, S.J. (2010) ‘Qualitative Quality: Eight “Big-Tent” Criteria for Excellent Qualitative Research’, *Qualitative Inquiry*, 16(10), pp. 837–851. Available at: <https://doi.org/10.1177/1077800410383121>.

[RC1d] Results *The authors are inconsistent in stating the source of their results. I often read ‘Many papers (line 261)’; ‘Several studies (line 270)’. I think it would strengthen the claims made by the authors to explicitly state how many papers these findings are based.*

To me it does not become clear on which information the y-axis of figure 6 is based. How is this resource intensity inferred? The link to ‘the literature’ can be made more explicit. I am also not sure whether this figure is correctly placed under the Result section of this paper, or whether it is a part of the theoretical framework as described in the introduction of the paper.

[Response to RC1d] We will improve consistency in stating the sources of results, as suggested. We will revisit Figure 6 and combine this with Table 3. We will incorporate further analysis of the papers into a re-drawn Figure 6, responding to comments by RC1 and RC2. In the original figure, ‘resource intensity’ related to the variation in the data required to understand systems and required actions in a ‘single hazard’ way vs. a ‘multi-hazard’ way. This builds on the multi-hazard literature (e.g., Kappes et al., 2012) and will be explained more carefully in the figure caption of the revised manuscript. The figure is part of the theoretical framework, but also used to explore the results and put them into the broader context of multi-hazard work (hence it being in the results/discussion section. We will improve the framing of this to make that clear.

[RC1e] *Does the paper present new data and/or novel concepts, ideas, tools, methods or results? The paper proposes clear research suggestions to further the field of disaster preparedness in the context of multi-hazards by making suggestions for further research. These suggestions could perhaps be made more explicit; would there also be examples of good practices in preparedness literature that could be named there? Particularly in the suggestion to broaden the definition of what constitutes a household.*

[Response to RC1e] We will seek to make the suggestions for further research more explicit, as requested, and better profile examples of good practice identified in the preparedness literature.

[RC1f] *The figures need to be improved for it to be eligible for publication.*

The quality of the figures in this paper should be improved. For example, fonts in figure 3 and 4 appear to be stretched. The color coding in figure 4 is a bit confusing, maybe another color than a light shade of green could be used to indicate the principle was ignored included in the study. Figure 5 is a screenshot, the selection of the graph element is still visible. For consistency it would be better in figure 2 and 4 either show the number of studies or the percentage.

[Response to RC1f] Thank you for spotting this. We will ensure that in our revised manuscript, figures are not stretched. We will change the colour of the ‘ignore’ category in figure 4, using a ‘qualitative’ colour scheme from colorbrewer. We will ensure that figure 5 is exported correctly. We will change the format of Figure 2 to be percentages of articles.

[RC1g] *The literature review follows a scientific method, although the selection of the 138 out of 587 papers could perhaps be better elaborated (see point under General).*

[Response to RC1g]. Please see response to RC1c. In the revision we will elaborate more on the criteria for meeting thematic saturation, citing key literature on this. For example:

Saunders, B. et al. (2018) ‘Saturation in qualitative research: exploring its conceptualization and operationalization’, *Quality & Quantity*, 52(4), pp. 1893–1907. Available at: <https://doi.org/10.1007/s11135-017-0574-8>.

Tracy, S.J. (2010) 'Qualitative Quality: Eight "Big-Tent" Criteria for Excellent Qualitative Research', *Qualitative Inquiry*, 16(10), pp. 837–851. Available at: <https://doi.org/10.1177/1077800410383121>.

[RC1h] Abstract - *The main findings stated in the abstract deviate from the findings listed in the conclusion section of the paper. These could be better aligned.*

The abstract and findings are easy to understand to a wide audience. It would perhaps be good to also explicitly state the "Priority 4 of the Sendai Framework for Disaster Risk Reduction 2015–30" to increase the comprehensibility of the abstract.

[Response to RC1h] Thank you for this guidance, we will review the conclusion to ensure that it aligns well with the abstract, and explicitly state the "Priority 4 of the Sendai Framework for Disaster Risk Reduction 2015–30" to increase the comprehensibility of the abstract.

[RC1i] *I would encourage the authors to include a supplementary table that shows all literature reviewed with this article.*

[Response to RC1i] We agree and will prepare supplementary material that presents the full results of the literature review.

[RC2] Anonymous Referee #2

[RC2a] *The article addresses the very promising and underexplored topic of multi-hazard preparedness, with a unique focus on household-level preparedness. For this reason, I believe it can make a significant contribution to the DRR field and initiate a fruitful discussion on how to enhance household preparedness against the increasingly frequent multi-hazard disaster risk scenarios they are exposed to, due to climate change and interactions with other anthropogenic activities and pressures.*

[Response to RC2a] Thank you for taking the time to provide a constructive review for this work. The comments provided are helpful and we agree will strengthen the paper.

[RC2b] *As the authors mentioned in lines 539-540, one of the limitations of this work is the unique focus on peer-reviewed literature. I think this is a huge limitation, given the topic of the review. Indeed, a lot of advancements in disaster risk preparedness, even at the household level, are promoted by civil protection and emergency management agencies, and therefore documented in technical reports and grey literature in general. For this reason, I think that the authors should set up the expectations of the readers from the beginning, providing a title that better reflects this specific angle of analysis. As a suggestion to start reflecting on: "Multi-hazards and household preparedness planning conceptualisation in academic literature."*

[Response to RC2b] We agree and will adapt the title as suggested.

[RC2c] *The rationale for including Table 2 in the manuscript is unclear. The different types of hazard interrelationships presented are neither used in the subsequent literature analysis nor theoretically examined in terms of how distinct mechanisms should be accounted for in household preparedness planning practices. I suggest either removing it or including some additional reflections to justify its presence.*

[Response to RC2c] We agree with the reviewer. We will delete the table, while including any key information in text instead.

[RC2d] In Table 3, it would be beneficial to include the references associated with each identified preparedness approach, if they are derived from literature. If not, the authors should explicitly explain how they identified them.

Lines 140-143: Why is the type of preparedness approach (see Table 3) not proposed as an aspect of the investigation of the literature?

[Response to RC2d] Ideas about the different types of preparedness evolved through the research process so were not embedded in analysis from the outset. Thus we will move the table to the end of the paper as a way to present the implications of our analysis, perhaps combining it with a revised Figure 6, as per our response to your comment under RC2i below,

[RC2e] What does “the success of the household preparedness plan” (element III in the list) mean? I invite the authors to better explain this part of the methodology.

[Response to RC2e] This metric was intended to work in two interconnected ways. First, to understand whether the subjects of the research were deemed to be prepared because of either the specific measures in place to build preparedness, or because of the impacts of the research itself (i.e. if the research was action-oriented and intended as a way to develop preparedness itself). The second use of this methodology of the paper was deemed to be successful in being able to accurately measure preparedness. This was partly set up as a response to an initial read of key papers that revealed the emphasis on the measurement of preparedness in the literature. This was an interpretative exercise to try and make sense of the literature and categorise it. We used a Likert scale to support this and will make sure to explain the process in more detail in the revision.

[RC2f] Lines 164-167: It is not clear how the authors passed from 587 articles (line 164) to 138 papers (line 165). I invite them to explain more in detail. Moreover, I suggest also discussing here the choice of starting from 2006. It is implicitly reported in the search string at line 150, but never explicitly reported or justified.

[Response to RC2f] We thank the authors for their comment and will revise the text to more explicitly explain the process through which the 138 papers were derived from the initial 587 (see also response to RC1c). We will also clarify the rationale for selecting 2006 as the starting point for inclusion. In short, this was to align with the principles of preparedness set out by Sutton and Tierney (2006), though there are other reasons which we will elaborate on in the revision.

[RC2g] Line 214: What does “challenge of the principle” mean? I invite the author to explain it more explicitly.

[Response to RC2g] Thank you for noting this. This is a typographical error and should read "challenges the principle." I.e., the overall argument or premise of the paper challenges one of Sutton and Tierney's principles of preparedness. We will rectify this in the revision.

[RC2h] At lines 307–311, the authors state that Sutton and Tierney’s framework “offered limited analytical traction in positioning the preparedness literature within a multi-hazard context” and therefore motivated a further analysis presented in Section 5.3. However, given that one of the main objectives and added values of this study is the analysis of the multi-hazard perspective in preparedness plans, it is unclear why the authors did not incorporate this aspect directly into the methodological framework from the outset. Specifically, it would seem more coherent to replace the original 11th criterion of the Sutton and Tierney framework with an ad-hoc multi-hazard indicator capable of classifying the type of multi-hazard approach adopted (those outlined in Table 3), rather than addressing this limitation only through a subsequent, separate analysis.

Moreover, restricting the analysis to the identification of Sutton and Tierney's principles in the literature may introduce an initial bias, as it could limit the ability to identify other emerging or alternative themes within the analysed body of literature. This potential limitation of the approach should therefore be explicitly acknowledged and discussed in the limitations section.

[Response to RC2h] Thank you for these suggestions. We will revisit our analysis and see how we can re-analyse and reinterpret the data to speak to the points you make here. We will also make sure to reflect on the limitations of our approach if there remain key issues which our data doesn't help to understand.

***[RC2i]** Figure 6: What does the "Resource Intensity" in the y-axis measure? I invite the authors to explain this figure in detail. Moreover, it is not reported anywhere how many papers were identified in each of these categories of hazard specificities. I think this could be very useful information to report.*

[Response to RC2i] As noted in response to R1, we will revisit Figure 6 and combine this with Table 3. As indicated in our response to RC2h (i.e. reinterpreting the data on multi-hazards), we will incorporate further analysis of the papers into a re-drawn Figure 6, responding to both comments. In the original figure, 'resource intensity' related to the variation in the data required to understand systems and required actions in a 'single hazard' way vs. a 'multi-hazard' way. This builds on the multi-hazard literature (e.g., Kappes et al., 2012) and will be explained more carefully in the figure caption of the revised manuscript.

***[RC2j]** Finally, it would be very useful, if not essential for transparency and reproducibility in this type of study, to provide the full results of the literature review as supplementary material. Sharing this additional material would allow readers to better assess the robustness of the analysis and facilitate future research building on this work.*

[Response to RC2j] We agree and will prepare supplementary material that presents the full results of the literature review.

***[RC2k]** Other minor comments:*

- *Figures 3 and 5 seem low quality and stretched.*
- *In Figure 4, it is not necessary to include a table with the correspondence between the principles and the numbers, since they are already listed and numbered in Table*
- *Line 150: There is a missing closing quotation mark after 'Plan'*

[Response to RC2k] We will check correct these errors.