

Review article: current approaches and critical issues in multi-risk recovery planning of urban areas exposed to natural hazards - Soheil Mohammadi et al., 2023

Reply to reviewers' comments

Dear Editor and Reviewers

Thank you for your valuable feedback. We appreciate the constructive comments and guidance provided.

We have addressed the minor revisions suggested and provided a detailed reply to the reviewers' comments. Moreover, we incorporated language-related improvements in the revised version of the manuscript. We have included a track changes document that highlights the modifications made between the old and new versions.

Moreover, in consideration of the modifications in the manuscript based on the reviewers' suggestions, we have also provided a revised version of the supplementary material. Some minor changes have been made in the section names to align with the modifications in the manuscript.

We appreciate your time and consideration of our work and look forward to any further guidance you may provide.

Soheil Mohammadi and Co-authors

Reviewer #1 (Marleen de Ruiter)

I would like to thank the authors for their very elaborate response. They have done an excellent job and the manuscript has improved greatly. The manuscript now flows very logically and its aim is very clear. Moreover, the supplementary material is very clearly formatted.

Below I have some very minor and some language-related suggestions:

- L. 54: elaboration of
- L. 195: "...challenge recovery in multi-hazard environments."

- L. 202: "As a real example in the western part of Iran, a devastating earthquake occurred on November 12, 2017, at the Iran-Iraq border, causing the death of at least 630 people (Naserieh et al., 2022)."

o It is very nice that the authors included this example

o Please adjust: "real world" instead of real.

o Also, it may be interesting for the reader to know the magnitude of the earthquake; this can maybe be added to the sentence? ("...a devastating earthquake of magnitude XX...")

- L. 204: "...the more than ten thousand affected population..." -> "...the more than ten thousand affected people..."

- Fig 1 is an excellent addition to the paper (as suggested by review 2).

- L. 376: "The fundamental distinction between the two definitions of 'recovery' and 'reconstruction' provided by UNDRR"

o This source requires a year of publication (I assume 2020)

- L. 475: "...do not adequately..." ->The cycle (...) "does not"

- L. 603: "In the field of economic studies..." -> "In the field of economics..."

- L. 1006: "...divided into three time frame.." -> "...divided into three time frames.."

- L. 1159: "...In this final session.." -> section

[Authors reply]:

Dear Dr. De Ruiter,

Thank you for your thoughtful feedback and acknowledgment of our efforts to enhance the manuscript. We appreciate your positive comments on the improved logical flow and clarity of purpose. We also take note of your minor language-related suggestions and have carefully addressed and incorporated them to further enhance the quality of our work.

Reviewer #2 (Robert Sakic Trogrlic)

Overall comment

Dear authors,

Thank you very much for your efforts and congratulations for tackling the comments in such an extensive and detailed way. In my view, this has now greatly improved the manuscript. As mentioned previously, I believe this paper is a great

addition to the growing field of understanding multi-hazard risks and associated management practices.

[Authors reply]

Dear Dr. Trogrlic

Thank you sincerely for your kind words and appreciation. We are delighted to hear that our efforts in addressing the comments have significantly improved the manuscript. Your positive assessment and recognition of the paper's contribution to the field of multi-hazard risk understanding and management practices are truly motivating. We greatly appreciate your valuable feedback.

More specific comments

(C.1) P1 L8-10 Suggestion to separate this into two sentences

[Authors reply] We agree with this suggestion, and we have separated the sentence into two sentences to improve the readability:

"Nevertheless, studies providing holistic approaches to recovery, integrating reconstruction procedures and socio-economic impacts, are still lacking. Additionally, there is a gap in disaster recovery research addressing the additional challenges posed by the effect of complex, multiple, and interacting risks on highly interconnected urban areas."

(C.2) P1 L11 "Improve urban system recoverability" – In my view, this is redundant, please reconsider.

[Authors reply] Thank you for your suggestion. We have changed the sentence and remove the redundant part.

(C.3) In the Abstract, and later in the paper, you mix multi-risk and multi-hazard risk. Please ensure the consistency, especially as later on you refer to Ward et al 2022 paper.

[Authors reply] Thank you for your comment. We have revised the terminology in the Abstract. Furthermore, we have thoroughly reviewed the entire paper to ensure consistency and made corresponding modifications where needed.

(C.4-5) P2 L22 "safe refuges" to be changes to "safe refuge" or "safe heaven." P2 L60 change "composed by" to "composed of"

[Authors reply] We agree with your comment. We have modified the terms.

(C.6) P2 L64 Not just rapid expansion, but also unplanned and not risk informed. Please see Cremen et al. (2023) A state-of-the-art decision-support environment for risk-sensitive and pro-poor urban planning and design in Tomorrow's cities.

[Authors reply] Thank you very much for your invaluable comment. We have added the *"unplanned and not risk informed"* to the sentence:

" In fact, the rapid, unplanned, and not risk-informed expansion of urban areas often necessitates construction in locations that are susceptible to multiple hazards (Cremen et al., 2023)"

(C.7) P2 L70 Meerow et al (2016), please add page number as this is a direct quote

[Authors reply] Thank you for noticing that. We carefully checked it and we found that it is not required according to the "English guidelines and house standards" section in the NHESS Submission instructions.

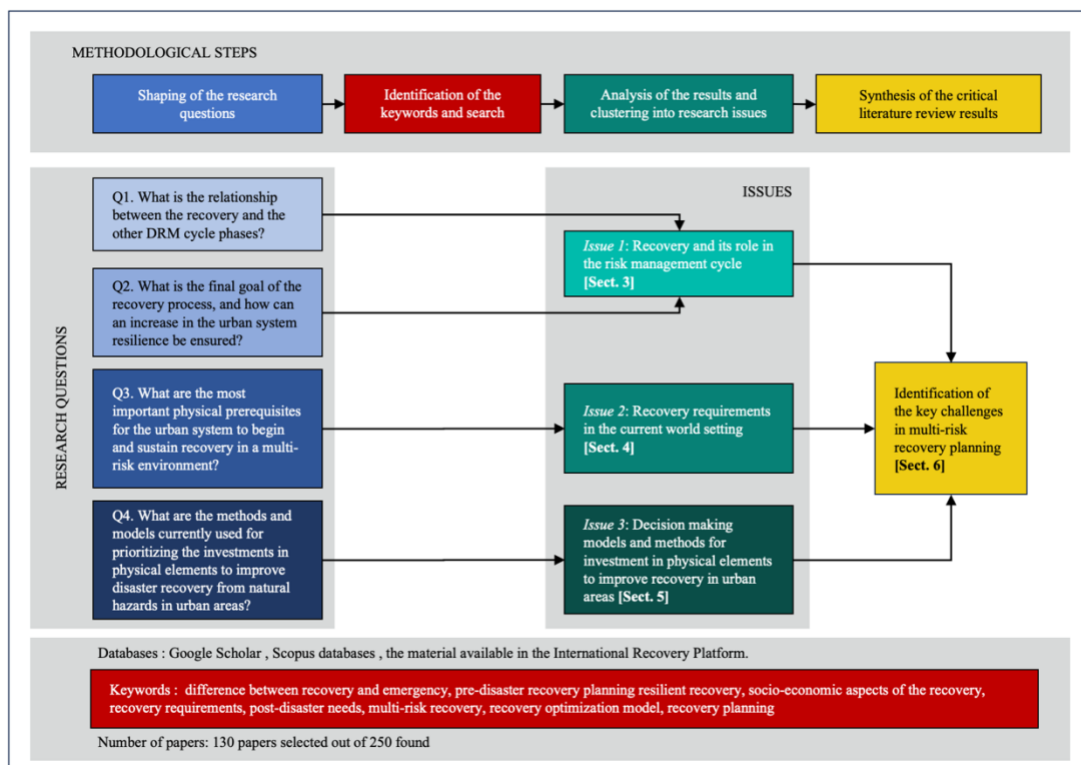
(C.8) P3 L124-126 A lot of research is quantifying the benefit ratios of investing in preparedness. Perhaps worthwhile reflecting on this research.

[Authors reply] Thank you for your comment. We have considered literature that quantifies the benefit ratios of investing in preparedness, and we have modified the sentence as follows:

"The resilience concept can be reflected in preparedness, response, recovery, and adaptation actions, depending on the temporal domain. Even though numerous studies have quantified the benefits of investing in preparedness by comparing potential damage and preparedness costs (Goldschmidt and Kumar, 2019; David R. et al., 2009; Kousky et al., 2019; Heo and Heo, 2019), there is still a notable absence of research that systematically evaluates the relationships and implications of different actions on one another in resilience-based urban planning are still absent (Rus et al., 2018)."

(C.9) Figure 1: Many thanks for making it. I suggest adding some keywords below "Keywords + databases" and an indication of a number of papers.

[Authors reply] Thank you for your previous constructive comment. The suggestion to include the Figure was also appreciated by the other reviewer, and it has enhanced the manuscript. We have made modifications to the figure, and it now appears as follows:



(C.10) • Table 1: If you see as important, perhaps add a column that will add “recovery as a desired outcome” and “recovery as a process”, to align text and definitions.

[Authors reply] Thank you for your comment. It is worth noting. However, since only one of the definitions in the table considers recovery as a desired outcome, we have opted to address this by adding a sentence to the text, rather than incorporating an additional column into the table.

“In Table 1, all definitions, except the one provided by Quarantelli (1989), conceptualize recovery as a process rather than a desired outcome. ”

(C.11) P11 L470 Reflect on the overlap of DRM phases (see Twigg, J., 2015. Disaster Risk Reduction- Good Practice Review 9. 2nd ed. London, UK: Overseas Development Institute.)

[Authors reply] We appreciate your suggestion to reflect on the mentioned research. We have now included the reference to **Twigg, J. (2015)** and added a sentence as follow.

“However, the current understanding of recovery recognizes it as an ongoing, long-term process that can start simultaneously with the response phase, and the developmental recovery activities are extended alongside the mitigation phase, leading to the overlap of different phases in practice (Twigg, 2015). ”

(C.12) P12 L508-512 Your paragraphs are still very long which makes it at times challenging for the reader. Perhaps in places like this you could simplify through bullet pointing to increase the readability.

[Authors reply] We have added bullet point according to your suggestion.

(C.13-14) P12 L512 Naturally, here is a new paragraph? P12 L517 Same as the previous comment.

[Authors reply] Thank you for your comment. We have divided the text into two paragraphs

(C.15) P13 L557 Please define functionality.

[Authors reply] Thank you for your comment. We have defined the functionality as follow:

"In this study, the urban system functionality denotes the effective and interdependent operation of infrastructure, services, and socio-economic activities within a city to meet the needs of its population and safeguard them against potential hazards."

(C.16) • P15 L643 "Emergency phase" or "Response phase"? Response has been used previously. Please ensure consistency of terms throughout the paper.

[Authors reply] Thank you for noticing that. We have gone through the manuscript and tried to be consistent concerning the "Response phase".

(C.17) Table 2: You mention 8 publications but have only 2 in the table?

[Authors reply] Thank you for noticing that. We have included 6 publication and modified the table caption accordingly.

(C.18) P22 L900-902 Please rephrase the sentence.

[Authors reply] Thank you for your suggestion. We rephrase the sentence as follow:

"However, there is often not enough focus on land-use planning for flood mitigation and evacuation modelling or in general flood disaster risk management"

(C.19) P23 Too long – an example where the text could be cut significantly. Perhaps some of the critique can be integrated in Table 3 and text shortened.

[Authors reply] Thank you for your comment. While we appreciate the suggestion to integrate some of the critique into Table 3 and shorten the text on page 23, we believe that It's important to note that the extended content in this section is dedicated to thoroughly discussing current approaches in multi-risk recovery, including their respective advantages and disadvantages.

Moreover, please consider that the table in the text represents a condensed version of the complete table found in the supplementary material. Each of the 4 mentioned publication in the table represent a specific approach, and the detailed nuances of these approaches might not be possible if integrate the content into the table.

(C.20) Figure 5: instead of "time frame" please add "time frames"

[Authors reply] Thank you for your comment. We modified the Figure 5.

