

Journal Paper Reviewed: Gomez Rave, D. V., Scolobig, A., and del Jesus, M.: Review article: Rethinking Preparedness for Coastal Compound Flooding: Insights from a Systematic Review, EGU sphere [preprint], <https://doi.org/10.5194/egusphere-2025-262>, 2025.

Journal: Natural Hazards and Earth System Sciences (NHESS)

## **1. General Comments**

The preprint titled "Rethinking Preparedness for Coastal Compound Flooding (CF): Insights from a Systematic Review" provides an insightful examination of strategies for managing compound flooding (CF) risks based on a structured literature review. The authors address the need to consider the multiple aspects of compound flooding risk including solutions that combine technical, environmental, and social dimensions, as well as the critical role of governance and multi-stakeholder collaboration.

Strengths of the paper include illustrating the evolution of CF research—from hazard-specific technical approaches to more holistic frameworks, while offering a critical lens on the shortcomings of current governance structures and participatory strategies. However, clear definitions and use of flood risk and disaster management terms are lacking. As a result, the paper framing lacks clarity and accurate use of terms which are well defined in the scientific literature. In particular the use of the term “preparedness” seems to be applied to more than just the preparedness phase of the disaster management cycle but rather flood risk and adaptation more broadly. The definition and use of this term, which also appears in the title should be clear.

Additionally, the integration of case studies based on the most relevant papers (e.g., China’s Sponge City Program, the Netherlands’ Delta Plan) adds depth to the analysis. However, the paper would be improved with a more explicit discussion of the limitations of the reviewed studies, particularly in terms of data availability and transferability. In addition, a more cohesive discussion section which distills and structures the findings for future research and practical applications would improve the impact of the paper.

Overall, this preprint makes a valuable contribution to the literature on disaster risk reduction and climate adaptation. With major revisions, it has the potential to contribute meaningfully to the scientific literature on compound flood risk management.

## **2. Specific Comments**

### Framing

The flood risk and disaster management terms used are not defined and therefore the framing is unclear. For example, the stated focus is on preparedness, however, Blue & Green Infrastructure for example is more connected to adaptation or mitigation of hazards rather than preparedness.

I would encourage the authors to clearly define the risk equation they are using (hazard, exposure, vulnerability) and the disaster management cycle (preparedness, event/disaster, response, recovery, mitigation/adaptation) and cite relevant literature (for example Koks et. al., 2015).

It seems that the intended focus is more risk reduction strategies across the disaster risk management cycle for compound floods in coastal areas. The conclusion does not mention the coastal context at all which is supposed to be the focus of this study. The findings should connect back to the focus area and provide an outlook related to that context.

### Methodology

The use of ASReview and BERT model is innovative and the steps are clearly explained. It is mentioned that the ASReview model is based on their textual features to prevent author name and citation network biases. However, other biases can exist while using machine learning screening (e.g., keyword selection, training data). If these were addressed or at least identified this could be added.

Also, a clearer explanation of how subjective decisions were minimized would enhance reproducibility. The PRISMA flowchart (Figure 2) is clear but it would be helpful to add more detail on how the 49 articles were assessed to align with the research questions.

#### Thematic Gaps

While the paper acknowledges underrepresented themes like governance and behavioral dimensions, it stops short of proposing specific pathways for addressing them. The conclusion hints at the need for co-production and hybrid strategies but could be more explicit in offering guidance for implementation, especially in varied socio-political contexts.

The discussion on fragmented governance (Figure 8) and the challenges is valuable but could be strengthened by referencing mechanisms known in the literature to improve cross-sectoral coordination such as policy incentives or joint funding programs.

In addition, it may be helpful to look at the broader literature on several points. For example, it is mentioned that nature-based solutions are rather implemented in middle income countries but there are many projects that incorporate NbS in all income levels. For example, green dike and making room for the river projects in the Netherlands and Mangrove restoration in many countries globally. In addition, Indigenous Knowledge is integrated into preparedness and adaptation in high income countries (e.g. New Zealand, Australia, Canada). Perhaps rather than classification based on income, the approaches could be referenced (eg: NbS, Indigenous Knowledge) with some reference to regional strengths and challenges.

#### Figures and Visualizations

Figures are generally helpful and relevant, however, the design of some visuals (e.g., Figures 6 and 7) are dense and would benefit from simplification or improved legends to enhance readability.

#### Integration of Social Dimensions

The paper identifies a gap in social science research within the reviewed literature (Figure 3). It would be helpful to discuss why this gap exists and how it might impact the effectiveness of preparedness strategies. For example, are there biases in funding or publication trends that favor technical over social studies? Are there challenges with data collection or availability?

#### Regional Disparities:

The analysis of high-, middle-, and low-income countries is useful but somewhat generalized. More nuanced comparisons (e.g., within middle-income countries) could reveal additional insights about contextual factors influencing preparedness.

### **3. Technical Corrections**

TC #	Line #	
1	Throughout	Consider rephrasing long or complex sentences to improve readability, especially in the methods and discussion sections.

2	Throughout	With the term “compound flooding” you sometimes abbreviate as “CF” and sometimes don’t. This should be standardized throughout the paper.
3	Line 8 to 22	Abstract should mention the methods used and highlight key results.
4	Lines 55, 103, and 297	Sendai Framework is introduced twice Line 55 and 103. Phrasing about Sendai on Line 297 also sounds like it wasn’t mentioned before. Connect these references.
5	Line 155-157	You mention “storm surges, river flooding, and extreme rainfall” create heightened risk. These are all related to the hazard component of risk. If you only focus on hazard then this should be clearly stated. However, you later specify that you are looking at how strategies integrate technical, environmental, and social dimensions which suggests you look at drivers related to multiple components of risk. Be clear about how you define a use risk and hazard terminology.
6	Line 194	What is meant by “reflecting the diverse strategies employed to address flood risk and preparedness”. Flood risk is something exists due to a combination of hazard, exposure, and vulnerability. Risk reduction measures can target each of these components. Actions for risk reduction can also be framed as targeting particular phases of the disaster management cycle including preparedness.
7	Line 224	Researcher-In-The-Loop (RITL) is mentioned in full twice with the abbreviation. Just include this once and then use the abbreviation.
8	Lines 273 - 276	The two sentences starting with “In parallel, it is important to acknowledge...” are a bit awkward. Consider rephrasing.
9	Table 2	Clarify that the years listed are publication years, and ensure consistent formatting across entries. Possible double entry error for year with (Chan et al., 2023) The years and references with years are also somewhat redundant. Consider reformatting and perhaps only include the reference.
10	Line 307	Reference to the literature would fit here at the end of the sentence.
11	Line 246-247	“...this nuanced aspect of preparedness...” It is unclear what this refers to.
12	Line 544	You mention “cognitive bias” here for the first time in the conclusions. While cognitive simplification is mentioned earlier in the article with regards to CF “cognitive bias” is not clearly addressed in the article. Be clear about what you mean in the conclusions and/or reference how you use the term earlier in the article.
13	Line 422	Typo with extra period
14	Lines 281 to 284	Provide reference and quantification of increase in publications on natural hazard research.