

Interactive comment on “Exposure to Floods, Climate Change, and Poverty in Vietnam” by Mook Bangalore et al.

Anonymous Referee #2

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In the manuscript, authors assess the distribution of flood exposure among poor and non-poor locations. The topic is interesting and broad. However, the manuscript is far away from publication. I would suggest 'major revision' taking into account following comments:

1. Authors have used the term, 'hazards' and 'risk' interchangeably throughout the manuscript. Authors should take necessary care and consistency of using these terminologies.

We will revise. Thanks for pointing this out.

2. The paper seems much more policy oriented than academic journal article. How the research contributes to the field of natural hazards is not clear. Certainly the research support to Vietnamese policy makers, but what are the benefits of general readers of the natural hazards (science) community is a big question mark.

While this research does support policy makers in the region, we feel as if it also contributes to the academic research on natural hazards. This paper is the first to combine high-resolution flood hazard modeling with spatially-explicit poverty maps. In addition, we assess how flood exposure is distributed across poor and non-poor areas, at the country and city levels. We believe the combination of these datasets – typically kept separate in the field – and the analysis at multiple levels is a contribution to the science community.

3. Instead of only considering Vietnamese context, authors should provide state of art on the issue and they should explicitly consider some innovativeness in their research. In first two paragraphs of literature review section, it seems that this kind of research has already been done elsewhere. Therefore, why another similar research is required to the science community? I would suggest to revisit the manuscript.

When examining flood exposure, it is important to get as local as possible since impacts can vary widely across space. Indeed, unlike other perils flooding is spatially complex, requiring local features to be resolved sufficiently in order to obtain an accurate picture of flood risk. While previous studies mostly focus on dynamics at the country level, the contribution regarding state-of-the-art is the high resolution at which the analysis is conducted. At best, the studies listed in the literature review use hazard data that are resolved at a resolution of $\sim 1\text{km}^2$. The flood hazard model used here represents a true state-of-the-art model, using a fully 2D hydrodynamic model to resolve flood hazard at a resolution of $\sim 90\text{m}^2$. Furthermore, the poverty maps used are at the district level, which provide a precise estimate of poverty status across the country.

In addition, in line with another reviewer's comment, we will add a more general theoretical underpinning of the topic of flood risk and poverty, which will further clarify the value added of this work.

4. As 'literature review' is usually considered in academic thesis paper (not for journal article), I would suggest to include them within introduction section for better representing state-of-art.

Thanks for your suggestion. We will review other state-of-the-art studies and adjust the structure accordingly.

5. I would suggest to consider some recent articles on flood risks in Vietnamese context (e.g., Apel et al., 2016; Chinh et al., 2016, 2017).

Thanks for sharing these. We will take a look and include.

6. Authors have considered 'head count rate' for assessing poverty. There are also other indices for assessing poverty. Authors should provide a justification of their choice.

For Vietnam, the only data available is on the headcount rate and on the headcount. Other indices for poverty were not available at the district-level for Vietnam. We will add this to the paper as a justification for our choice.

7. In table 3, 'm' within bracket: does it denotes millions? Authors should explicitly define this.

Yes, that is millions. Thanks for pointing it out. We will revise.

8. No validation of the simulated results has been done except footnote 3 (on Jongman et al. 2014). Is there any national statistics on historical flood exposed population?

While there are some reports with images, details on national statistics on historical flood exposed population are unavailable. However, when we discussed this paper with colleagues on the ground in Vietnam, they tended to agree that the numbers were in the range of estimates they expected. We can also check our results against past disaster events in Vietnam, using the EM-DAT database on disasters.

9. In the conclusion, I would suggest to generalize some results from the analysis that can also be useful for other areas.

Thanks for this comment. We will revise.

Suggested References Apel, H., Martínez-Trepat, O., Hung, N. N., Chinh, D. T., Merz, B., and Dung, N. V.: Combined fluvial and pluvial urban flood hazard analysis: concept development and application to Can Tho city, Mekong Delta, Vietnam, *Nat. Hazards Earth Syst. Sci.*, 16, 941-961, <https://doi.org/10.5194/nhess-16-941-2016>, 2016.

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