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Comment on nhess-2021-27

Anonymous Referee #1

Referee comment on "Compound inland flood events: different pathways–different impacts–different coping options?" by Annegret H. Thieken et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-27-RC1>, 2021

Manuscript presents an analysis of the database on questionnaires after the 2013 and 2016 floods in Germany, comprehending data on socio-demographic characteristics, hydraulic flood characteristics, financial impacts and recovery, coping strategies, previous experience and risk perception by citizens. The analysis is based on averages of the data within four distinct hazard classifications (=pathways: dike breach, river flood, surface water flood, flash flood); cross-comparisons are discussed on a qualitative basis; no quantitative correlations are performed.

Paper is in general well organized and written. Some sections may be shortened, but this is not a crucial point. Resulting evidences are sometimes quite expected (for example: warning is more critical for flash flood with respect to river floods; forecasting convecting storms or dike breaches is challenging). Other results are less obvious and potentially more informative.

Data analysis reveals some interesting points. However, I think that the global result is weak, and the take-home message not really sharp. I try to elaborate this.

The four scenarios (pathways) here depicted have, indeed, significant differences for some of the analysed characteristics. However: are such different a general property of the pathway, or are they related to the specific event? In other words: can we conclude, say, that all (most) dike-breach events have some characteristics differentiating them from all (most) surface water floods?

As said, some characteristics are quite obviously related to the definition of the pathway, and can be expected to be general (but this would be a relatively expected conclusion); others may not be obvious, but I do not know how to conclude that they have general validity. For example: "shortcomings in crisis and risk communication" are related to pluvial flooding (as suggested at line 398) or to the specific event and the local organization of the specific area?

Aim of the paper is to "reveal whether and how people affected by different flood types and pathways were prepared before the damaging event, how they were impacted in

hydraulic, financial and psychological terms, and how they coped with and recovered from these impacts. The intention is to provide more insights that help establish risk management strategies tailored to different flood types and pathways.”

As we see, the aim is basically to qualitatively describe some general characteristics; as said, I fear that such scenarios may have no general value and, therefore, may not be applicable in similar hazard pathways but in different social and geographic contexts. Consequently, we may surely agree on the risk management strategies proposed for the four depicted situations, but we should link them to the global scenarios for the four situations, including all hazard + exposure + vulnerability indicators, rather than to the hazard pathways only.

Finally, I have one specific (but not irrelevant) objection: definitions of the pathways are not univocal. Distinction between surface water flood and flash flood for the 2016 event, even if somehow subjective, looks relatively robust. However, distinction between dike breach and river flood for the 2013 event is based on the indication of citizens: “all households that reported that they had been affected by a dike breach were included in this subsample”. Can we really assume that citizens have robust knowledge of the mechanics of the flood (pathway) hitting their house? Was any validation of their declarations performed?

On the whole, I do not think that the manuscript provides significant innovation and extra knowledge for the field of flood risk assessment and management.