

**09 Nov 2021**

**Editor decision: Publish subject to minor revisions (review by editor)**

**by Bart van den Hurk**

Comments to the author:

The two reviewers have a different recommendation on how to proceed with the paper. Both reviewers indicate that the revised manuscript contains a lot of interesting evidence that will inspire future research scholars in how to address various sources of diversity in the analysis of flood damage and consequences. However, reviewer #1 also notes that the conclusions from this analysis are fairly generic and don't reveal a clear picture on how these results should be taken forward in analysis of flood impacts, particularly in (cultural) settings outside Germany. Although it is not within the scope of this manuscript to describe a worldwide assessment of flood impacts, it would be very valuable if the conclusion section would contain a set of statements on how the results reported here could not only refer to the complex interplay of factors as illustrated, but also could help to make this complexity better manageable while designing early warning, response or educational applications, preferably taking into account the unknown factors contributing to complexity in areas (outside Germany) where this survey was not carried out. This new version will not be sent out for external review anymore.

**Response as of 18 Nov 2021**

Dear editor,

Thank you for considering our paper for publication in NHESS. We carefully read the manuscript again, changes a few minor things in the introduction and following sections and focussed on providing more substantial conclusions. The last part of the concluding section was substantially revised and extended. It now reads:

*“Altogether, the study demonstrates that flood hazard characteristics, impacts and coping options differ between and also within compound inland flood events. Hydraulic characteristics and flood impacts are strongly governed by the specific flood pathway, while coping options (short and long term) are more related to the general flood type (i.e., fluvial and pluvial). Hence, the concept of spatially compound events is helpful to understand different flood impacts, but could be strengthened towards coping and adaptive behaviour. The above-mentioned flood pathway-specific recommendations for risk communication and management are a first step in this direction. In addition, we can draw some conclusions that go beyond the studied cases and the German context.*

*First, the relation between hydraulic forces and impacts strongly support recommendations of developing pathway-specific loss models as done by Vogel et al. (2018) or Mohor et al. (2020, 2021). Research on this is, however, in its infancy. Secondly, to further mitigate damage, risk and crisis communication should distinguish not only flood types, but also pathways highlighting their specific threats, e.g. life-threatening situations during flash floods. Identifying and communicating such threats might better fulfil user needs, as it has been shown that adding impact information or additional descriptions of the threats may provide a clearer picture of the upcoming situation than abstract indications of warning levels (e.g. “strong”), specially to less proficient users (Kox et al., 2018). With regard to flash floods options for local warning and alerting systems should be explored as an option of improving warning and response in small catchments.*

*Thirdly, it should be noted that experiencing strong flooding caused by dike breaches or flash floods boost precaution, while surface water flooding does not, although the latter can happen almost everywhere. Therefore, modes to communicate and experience flood impacts in a tangible way are particularly important (e.g. exhibitions, storytelling etc.). In addition, the efficacy of emergency and precautionary measures with regard to different pathways needs further research. Finally, people affected by strong pathways such as dike breaches or flash floods (with sediment loads) need special assistance to recover physically and mentally from the impacts; their burden is the highest. Our results indicate that these residents experience limits of their adaptation options.”*

We hope that these amendments meet your expectations.

Thank you for your patience with this paper.

Best regards

Annegret Thieken

(on behalf of all authors)