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# *Interactive comment on* "New insights into flood warning and emergency response from the perspective of affected parties" *by* H. Kreibich et al.

**H. Kreibich et al.**

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Dear Referee, thank you very much for your work. We thank you very muchl for your very valuable critique and very helpful suggestions how to improve our manuscript. The following comments discuss how we will respond to each of your comments. Our answers are marked with an "R" and are written in italics.

Best regards

Heidi Kreibich on behalf of all co-authors

Referee #2:



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Discussion paper

The paper discusses findings from polls conducted at flood affected households and businesses in 2002 and 2013 to analyze changes in flood early warning awareness and usage and how this can be further improved. Improving end-to-end early warning systems for both public and commercial companies is highly relevant in the context of integrated flood risk management. The paper would profit from reviewing the current state-of-the-art of early warning systems in various contexts - currently, there is a lack of explanation of this, especially there is ample track record of so-called 'end-to-end' early warning systems in more developing country contexts, from which many things can be learnt. Examples can be found at UNISDR, WHO, Prevention Web etc. If the explanation that 'suitable methods for communicating helpful warnings to the "last mile" remains a challenge' (Abstract) is to be taken seriously, it should be explained what those methods should comprise of and how they could be implemented.

R: We will include a separate background section, where we expand and update the literature review. However, the study focusses on how and when people and companies received flood warning and how they responded. The warning systems, how they worked in detail and what measures should be implemented to improve them further was not investigated and is not part of this paper. Therefore, we will focus the introduction more on the specific topic of the study and also develop the background section in this respect.

The topic of integrated early warning systems and effective communication that would enable people to take action is not further explored in the paper, unfortunately. The explanations on page 4 only highlight whether people knew what to do, but not whether this was in context of the warning reaching them and what that warning message contained.

R: As said before, integrated early warning systems and effective communication was not investigated in detail, since the study has a different research focus. Still, we will include information about the content of the warning message in respect to the private households. For companies this information is not available.

It would be helpful to understand which flooded areas overlapping in 2002 and 2013 were sampled for the paper (on a map). We know there were problems with forecasting and early warning in the Inn watershed and especially around Passau, leading to increased damage, which is not mentioned in this paper. As such, it can probably not be generalized that flood warnings were better everywhere in Germany 2002->2013 (e.g. paragraph on p4).

R: We will include a study area section with two maps for the two flood events indicating the municipalities where interviews have been undertaken. Additionally, we will divide the research area, i.e. affected areas where interviews have been undertaken in probably three sub-regions in analogy to the analyses undertaken by Thieken et al. 2007 (HSJ 52(5), 1016-1037).

There is no statistical break down into areas or clusters, which would be helpful to understand. While the paper highlights that medians and averages in the polls improved, I would assume there could be some geographical differences, which would highlight where improvements were made and were not, or where improvements were better and were not. This would add another important layer of key insights to the paper.

R: We agree, that particularly more detailed spatial analyses are interesting, thus, we will divide the research area, i.e. affected areas where interviews have been undertaken in probably three sub-regions in analogy to the analyses undertaken by Thieken et al. 2007 (HSJ 52(5), 1016-1037).

Specific comments: p1 l 26: I would put human life first, then material and cultural damage. EWS typically try to protect human life as a first priority, especially as they are often implemented by gov't authorities whose primary mandate is civil protection.

R: will be corrected

p 2 l 10/11: The description of shallow and high water depths is very relative. Overtopping of protection structures such as door / window flood barriers and sealings will

happen if the actual flood event is larger than the design flood level, which is a risk-based decision or a design-standard based decision. As such, overtopping will occur if the event is bigger 'than expected', not based on 'high water depths'. This has mostly to do with decision-making processes and understanding residual risk, which should be explained here.

R: will be corrected

p 2 l 23: Grimma is mentioned, which flooded badly in 2002 and 2013. It would be good to see how, if at all, damage was reduced in Grimma by the EWS in the 2013 event.

R: Due to small sample sizes in individual municipalities, such specific analyses are hardly possible. Since flood damage is influenced by many processes, disentangling the effects and identifying the effect of the EWS is unfortunately not possible on basis of our data. We suggest to divide the research area, i.e. affected areas where interviews have been undertaken in probably three sub-regions in analogy to the analyses undertaken by Thieken et al. 2007 (HSJ 52(5), 1016-1037).

p 3 l 3: should be 'point of view'

R: will be corrected

p5 l 5: This is purely a hypothesis ('maybe') and does not convey whether people were capacitated to take action through the warning communicated to them or not. This would be an important fact to have given what the paper tries to achieve.

R: the sentence will be rewritten

P 5 l 9: The paper should not convey the message that protecting buildings or pump out water is complicated. There is clear evidence that pre-event risk reduction such as these protection measures are successful and cost-effective if done properly. They may be seen as 'more complex' than purely sandbags but in the long run they have much higher success rates and are certainly not 'complicated.

R: the sentence will be rewritten

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