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Review and rebuttal of the paper

Performance of flood defences in the Netherlands during the 2021 Summer floods

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Editor handling the paper: Hans de Moel

Dear editor, dear reviewers,

Thank you for considering our paper and providing us with useful comments.

Reviewer A has made several suggestions for minor improvements of the text. These have all been accepted.

Reviewer B included several comments, questions, and suggestions in a separate document, as well as textual corrections in the manuscript. Most of the latter have been accepted. The comments etc. have been addressed below, as well as in the text where applicable.

MINOR ISSUES:

Objective/Conclusions of the article:

- While it is clear that the objective of the article is just to document the various incidents on the flood defence system, this objective should be made more explicit in the abstract and/or introduction, to inform the reader what to expect.
- Similarly, the conclusions and takeaways from the article (from documenting all these incidents) or key messages to be conveyed to the reader should also be made more explicit.
- If the author(s) consider that there is a clear follow up to this reporting, it would be good to clearly state next steps that could be taken.

  The above suggestions have been incorporated.

Introduction:

- Is it possible to provide the conditions of the extreme event (e.g., probability of event, highest water level at each location or specific condition that caused the corresponding failure)? Slomp (2021) has been added. He provides some information on this. Other articles in this Special Issue will address this issue more thoroughly.
    - It would also be interesting to provide some background on the actual conditions of the 2021 floods and compare them with the design conditions of the defences were failures occurred. For this, see Slomp (2021) as well.

- The present article describes examples presented in the 2021 publication. Is there any additional information or conclusions/takeaways in this article with respect to what was included in the 2021 publication? Apart from some rephrasing, no.
- Consider including a brief summary (and/or summary table) when introducing Figure 1 basically describing what is being shown in Figure 1 (e.g., location, type of measures put in place, type of failure, conditions, etc.)- This would result in either a long list (yet incomplete! – see later on, under 'Presentation'), or be little more than the section headers of Section 2. To avoid unnecessary duplications, no additions have been made in this regard.
- Would it be in any way possible to report on the % of locations that having had measures put in place, they had some type of failure? No, not in a meaningful way. First of all, there is a gradual scale regarding success/failure (having some seepage isn't perfect, yet it isn't a real failure either). And how to compute the percentage? Based on the number of measures, their length? What about the

undiscovered issues? (the situation at St. Annakapel was only discovered after the event, there may have been several more of such cases)

- Page 4, lines 3 to 5: sentence not clear, consider rephrasing Thanks for pointing this out, it has been rephrased
- For readers not familiar with Dutch data/models, it is suggested to introduce AHN/AHN3 (perhaps as a footnote) An explanation has been added.

Section 2:

- Section 2.1, page 4, line 9: if possible, it would be good to add photographs of some of the critical dike sections. Only for Aasterberg, there is an imperfect picture available, removed shortly before first submission. It is included now.
- Section 2.1, page 4, line 9: it would be good if you could also comment on other dike sections, such as dike section 83 (or 79 and 60), where water level also seemed to be higher than the dike crest. Done.

Section 3:

- Consider including a final conclusion along these lines:
    - This assessment provides evidence of the behaviour and performance of the dike system under the 2021 event scenario, and attests to the strength of the defences. It also highlights the critical dike locations and their corresponding failure mechanisms. This performance information can complement the safety assessment of dikes and in that way contribute to improving the efficiency of managing flood risk in the Netherlands. A more modest phrase has been used at the end of the article.

Presentation:

- The article would benefit from adding a table to accompany Figure 1, where the reader could see a summary of the different incidents and some of their main features. This table could also include some of the relevant event conditions at each of the locations. Creating such a table suffered from lack of completeness on various aspects, as the authorities involved did not record the same kind of data at each location. Such a table wouldn't really help to make things more clear.
- It would be ideal if the photographs provided could be made bigger to better appreciate their content. This will be considered at the final editing stage and will depend on the possibilities provided by the Editor.
- Include the sources of the photographs and diagrams in all figures. A few sources were missing and have been added. For several figures, sources are still not mentioned, because the authors themselves made or created them, e.g. Figure 1.

Language:

- While the text is clear in general, there are a couple of sentences that would benefit from rephrasing to better bring the message across. Hopefully, everything is clear now.

We hope that the manuscript will be acceptable in its present form. Sincerely,

The authors