

Interactive comment on “Low-hanging fruits in large-scale fluvial landscaping measures: trade-offs between flood hazard, costs, stakeholders and biodiversity” by Menno W. Straatsma et al.

H. Sandberg

holger.sandberg@hotmail.com

Received and published: 12 November 2018

I am a MSc student in physical geography at Uppsala University, with an interest in this field of research. The attached comments are therefore of this particular academic level.

The study is altogether a pleasant read with interesting and most realistic take on potential parameters affecting the choice of flood hazard measures. The paper provides useful material for evaluation of landscaping flood measures, taking into account the

C1

balance of flood hazard reduction, biodiversity and number of local stakeholders. As presented in the results of this study, the number of stakeholders, and their specific aim and priorities had significant effects on the implementation on flood measures.

I enjoyed the perspective of how the number of stakeholders presents problems for implementation as well as choice of flood measures. Higher number of stakeholders means more voices, with differing opinions, priorities and responsibilities. Private companies have in principle only responsibilities to their shareholders, and long-term flood safety might not be a high priority. However, there are various aspects of the study that you could expand upon, or approach differently. Please see comments below.

In the introduction you motivate the relevance and purpose of the study with increase in ongoing urbanization of flood deltas, global sea level rise and frequency/magnitude of alluvial floods. This is all relevant for the study as it quickly highlights why examinations of different flood measures are important in societies impacted by climate change. You mention a general increase in discharge but offer no explanation as to why. It could be worth to mention the trend of increasing precipitation. The precipitation in Netherlands has increased over the last 50 years, both in mean and extremes (Buishand et al., 2013; Daniels et al., 2014).

A more thorough readthrough is needed to clear up a number of typos and small language mistakes. At some points you refer to different figures and tables which I could not find in the article. If there is supplementary data containing additional figures and tables, you need to be more specific when referring to it.

On P7 line 23 you comment on the costs of landscaping measures in a way that, in my opinion, does not belong in a method section. This could be moved to results or discussion section.

Figure 10, consisting of a number of scatterplots, may need more clear and distinct description in terms of axis titles. I understand the principle of using a X-axis description for the bottom graph, which then applies to all graphs above. It is neat. But other

C2

alternatives could be easier to understand.

You mention how private land owners often tend to oppose measurements that lead to more frequent but smaller floods, as it negatively affects their activities. It might be worth discussing this aspect of flooding and societal response, as this dynamic can lead to so-called "adaptation effects" or "levee effects". These interesting dynamics of interactions between floods and societal response, along with socio-hydrological models are discussed in DiBaldassarre et al. (2015) and Mechler & Bouwer (2014).

You may want to expand on the time aspect of the different measures. Large scale interventions can take considerable time, and implementation time can stretch out over long periods. In the Discussion you mention the assumption made - that all measures are implemented instantaneously. I fully understand the reason for this assumption. Further implementation of the time aspect on this area could be subject in future studies.

List of small language and reference errors:

In a number of places in the article Table 5 is referred to. I cannot find this table in the article. If said table is in the supplementary data, you need to say so.

P6, lines 11 & 12. In line 11 you write Delft3D Flexible mesh. In the next row you instead write Delft3D FlexibleMesh. This may or may not be a conscious decision.

P6, lines 33 & 34. Figure 3e is referred to. I cannot find a Figure 3e that matches the description. I assume you mean Figure 2e.

P7, line 15. Missing period at end of sentence.

P16, line 7. Misspelled was.

P19, line 28. Grammatical error.

References

C3

Buishand et al. 2013. Homogeneity of precipitation series in the Netherlands and their trends in the past century. *Int. J. Climatol.* 33: 815-833.

Daniels et al. 2014. Spatial precipitation patterns and trends in the Netherlands during 1951-2009. *Int. J. Climatol.* 34: 1773-1784.

DiBaldassarre et al. 2015. Perspectives on socio-hydrology: Capturing feedbacks between physical and societal processes. *Water Resour. Res.* 51: 4770-4781.

Mechler & Bouwer. 2014. Understanding trends and projections of disaster losses and climate change: Is vulnerability the missing link? *Clim. Change.* 133: 23-35.

Interactive comment on *Nat. Hazards Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/nhess-2018-253>, 2018.

C4