

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.

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R1: Manuscript compares a variety of options for flood hazard mitigation (in a given area) with respect to (i) hydraulic effectiveness, (ii) economic cost of the measure, (iii) number of people/stakeholders involved (as a measure of social impact and / or feasibility) and (iv) ecological impact. Modelling tools for individual components of the problem are standard; evaluated scenarios are relatively . Please, consider that I am not an expert in ecology; therefore, I cannot judge whether the biodiversity index from the model BIOSAFE provides a significant measurement of ecological value. In the

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following, I will take it as granted.

Reply: The summary of the evaluation parameters by R1 are correct and concisely represented. We disagree with the statement that the modelling tools are standard. There are a number of tools available to address parts of the workflow to decide between interventions. Improving this workflow, making it faster, better automated and more realistic, allows a more thorough evaluation in the design phase. We were able to do this work using RiverScape at the scale of a 100 km river reach, which is rarely carried out to our knowledge. The integration of models from various disciplines creates additional value for decision support that can not be derived from monodisciplinary studies.

R1: I read (and re-read) the manuscript with interest but, at the end, I could not find any conclusive message to be learnt. In fact:

1. From the hydraulic point of view results are quite obvious.
2. “Clear trade-offs were revealed between evaluation parameters, but no single measure represented the optimal combination on all aspects”: this is also not surprising.
3. Links among control variables (mitigation measures) and state variables are quite expected; accordingly, trade-offs are also quite expected.
4. Showing the value of (semi) automatic tools while dealing with complex problems involving spatial variables over large areas does not represent a relevant finding.
5. It is true that “The multidimensional evaluation space provides a frame for the cocreation of adaptation paths for climate-proofing deltas”, as well as for other critical areas; however, authors terminate the narration just at the critical point of the story (“Our methodology suits the early stages of the planning process”): and now, how to proceed? So far authors conclude that “The results can help to argument in favor of establishing multi-stakeholder platforms”: this is surely correct, but not enough as a conclusive value of the paper. I understand that, at present, this is the state of development of the process, so that the author cannot tell the reader much more than this,

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based on the reality of the field case (see the Discussion section). However, this makes the story only weakly instructive.

All together, my opinion is that there is some (much?) interesting experience in this field case, but the material is not organized / presented in such a way that the reader can take home significant conclusions. I therefore suggest rejection of the paper.

Reply: We are glad to read that the results make sense to the referee, but unfortunately the referee did not provide references to publications where such expected results have been published and we did not find anywhere the combinations of the four dimensions are reported. Our request for references remains unanswered. Points 1 to 3 of the referee relate to the surprise of the findings. Surprise depends on your previous beliefs. It is not a goal to surprise but to evolve into a more evidence-based and expedient river management. This sometimes implies confirming that old methods are indeed effective, which is not surprising but valuable from the perspective of building the base of evidence.

We believe there is much interesting experience in our paper, as was also recognized by R3. This has now been brought forward more clearly. These findings will be useful for many readers, and the application in subsequent stakeholder processes will likely show additional value. We have revised the objective and updated the discussion to a large extent to bring our message forward more clearly. The message being: we quantitatively evaluated measures, which were positioned and parameterized using a priori stakeholder preferences. We adapted in the following manner and feel confident that this provides a clear take-home message for the reader:

1. We removed the emphasis from the trade-offs themselves and highlighted the quantification of the trade-offs in a standardized way. This compact visualization of a multi-dimensional feature space represents a new finding, which is based on a standardized method that can be applied elsewhere and should be of interest for a wide audience.
2. We highlighted the a priori stakeholder preferences and the way we included this

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in the positioning of measures. We discuss the position our paper taken in decision support, but also of stakeholder modeling using agent based models and game theory.

3. Stakeholder processes result in different outcomes based on the presence and resources of the participants. We do not find any papers that documented this even though we reviewed the literature carefully. We argue that our results provides a common ground for any stakeholder meeting, which increases mutual understanding.

R1: I have no suggestions on how to better shape this material with respect to my negative evaluation. On the opposite, I have a number of observations, which may be useful in the case the manuscript will be allowed to proceed along the editorial process and/or it will be submitted to different journals. Please, find them in the annotated pdf file.

Reply: We believe, we have brought the message forward clearly in the revised version of the paper. We are grateful for the annotations in the pdf. The paper was revised accordingly and where possible. A detailed list of adjustments can be made available if required.

The supplement integrates revisions from all referees.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-253/nhess-2018-253-AC4-supplement.pdf>

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

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