Nat. Hazards Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/nhess-2019-128-RC2, 2019

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Nature-Based Solutions for hydro-meteorological risk reduction: A state-of-the-art review of the research area" *by* Laddaporn Ruangpan et al.

Anonymous Referee #2

Received and published: 15 July 2019

Nature-Based Solutions for hydro-meteorological risk reduction: A state-of-the-art review of the research area

by Laddaporn Ruangpan, Zoran Vojinovic, Silvana Di Sabatino, Laura Sandra Leo, Vittoria Capobianco, Amy M. P. Oen, Michael McClain, Elena Lopez-Gunn

Comments to the Author Summary of the manuscript This manuscript (ms) reviews scientific publication on Nature-based solutions (NBS) for hydro-meteorological risk reduction and related terms. The authors proceeded in a systematic way by using search terms in various scientific literature databases and analyzed over 1000 references. The ms concludes by summarizing the main findings and suggesting further

research in some of the reviewed areas.

Evaluation I think the topic of this manuscript is highly relevant and important in order to review NBS to tackle the ecological crisis the world is facing. Accordingly, I do think that this ms should be considered for publication. However, I have my major doubts if the presented ms really helps to summarize the vast amount of literature on NBS and if it really identifies the knowledge gap in order to be able to recommend the area of focus for future research. My main concerns are the following:

i) Methodology: a simple search for "Nature-based solutions" in the WoS shows that three of the four most relevant and most cited papers have not been considered in this ms (Keesstra et al. 2018, Nesshover et al. 2017, and Eggermont et al. 2015). Accordingly, I would recommend revising the method of selecting research articles that are being taken into account in the review. ii) Structure: I recommend limiting the structure to three levels of subsection: especially section 4 could be better structured, avoiding sections with titles that do not clearly adhere to a three-level subsection structure. iii) Content is more valuable than academic metrics: while I do see a value in using academic metrics and search engines to select relevant literature, it would be helpful to review the actual characteristics, benefits, and scales of various NBS. Specifically, it would be helpful to have a table that summarizes area, volume of water retention, costs, and effectiveness (and other characteristics) of different NBS. The number of articles does not indicate anything about the effectiveness of a NBS, accordingly, I would encourage the authors to focus more on the characteristics of NBS rather than the number of articles found. In short, more quantitative assessments of the benefits of NBS rather than generic statements would be highly appreciated. iv) Definitions: in my opinion, it would be helpful to provide a table with definitions and examples of the various academic terms used in the review: The study provides generic definitions for GI, EbA, and NBS, but it is left upon the reader to interpret the definitions. I would recommend to complement Table 2 with some quantitative figures on water retention, area, costs, advantages, disadvantages etc.... (see also the previous comment). v)

Drought: it is well know that land reclamation and restoration reduces evaporation and mitigates the drought risk. However, the authors found only one single study referring to the drought risk. This might be due to a methodology based on “key words” rather than content. vi) Scale and examples: one example that struck me is the NBS “Room for the River Programme” in the Netherlands at the Rhine and Meuse. It is general knowledge that flood protection has to start upstream in the headwaters, where most of the precipitation occurs, to be efficient. Nevertheless, the ms only mentions NBS in the Netherlands (a third of the Netherlands are below sea level and sea levels are rising), ignoring the far more relevant NBS in upstream countries. This might be linked to the somewhat limited methodology of the literature review (see comment i). vii) Tools: in my opinion, the review of tools could be shortened, as it is slightly off the topic. Instead, more attention could be given to the quantification of the various benefits of NBS could be provided (see comment iii). viii) Conclusion: the current conclusion provides general and generic statements and any reader somewhat familiar with the topic does not really learn anything new. It would be helpful to generate more conclusive and quantitative statement based on the review: which NBS are most effective, which provide most multi-benefits, which require least areas, which are most accepted?

I recommend that the authors revise this ms thoroughly and resubmit it again for publication.

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