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Dübendorf, 23 June 2021

Response to referee # 3

Dear Referee

Thank you very much for reviewing our manuscript:

Judit Lienert, Jafet Andersson, Daniel Hofmann, Francisco Silva Pinto, Martijn Kuller, "Using Multi-Criteria Decision Analysis for transdisciplinary co-design of the FANFAR flood forecasting and alert system in West Africa". hess-2021-177

This manuscript was written for the HESS Special Issue **"Contributions of transdisciplinary approaches to hydrology and water resources management"**

We are grateful for the work that has gone into reviewing our paper. We do know that this takes a lot of time, which receives no direct reward. We are very willing to improve the manuscript based on your inputs, wherever possible.

We have addressed your comments one-by-one below. *The referees' comments are given in Italics*, our response is given in normal font.

We look forward to suggestions for improving the manuscript so that it meets requirements of publications in HESS.

With best regards,

Judit Lienert

also on behalf of my co-authors, Jafet Andersson, Daniel Hofmann, Francisco Silva Pinto, and Martijn Kuller

Anonymous Referee #3

1) The paper reports on the FANFAR project and its opportunities and challenges of developing a reliable and useable flood forecast system in West and Central Africa. It discusses the opportunities and challenges of integrating stakeholder knowledge and producing both scientific reliable and useful information (more about this in Lemos and Morehouse 2005). In section 1.3 MCDA is presented as a remedy for all transdisciplinary projects supported with the enumeration of six central lines of argumentation. In sum, the paper is rather descriptive than analytic. However, this is a very common problem of reporting about transdisciplinary projects, which is depended on transparent and thick descriptions about how processes of knowledge integration haven been implemented, how "data" from non-scientific experts is included and so on. The paper handles this endeavor with sufficient accuracy. In addition, a comprehensive annex is provided with helpful tables and feedback derived from stakeholder surveys.

The paper has a lot of merits of getting published, but I have also three critical comments:

Response: Thank you for this **overall positive evaluation**. We agree that the paper is rather descriptive than analytic, which is, as referee #3 states, a common problem of reporting about transdisciplinary projects. We are grateful that the referee acknowledges that we handle the endeavor of "knowledge integration" with sufficient accuracy.

Thank you for suggesting the interesting paper, which is indeed an important contribution. Already in the abstract, it states that: "It finds that although no single model can fulfill the multitude of goals of such assessments, **it is in highly interactive models** that the possibilities of higher levels of **innovation and related social impact are most likely to occur**" (Lemos & Morehouse, 2005). This follows the discourse that we shortly touched upon in the last part of the Discussion section 4.1.2. ("… , and model assumptions"), namely the paper by Hämäläinen (2015). There would be much more to add to this discussion about **modelling with and for stakeholders** (see e.g., Voinov et al., 2016). It is a question of space and priority, how strongly we can and should expand this topic.

It was not our intention to **advocate "MCDA (as …) a remedy** for all transdisciplinary projects". We will do our best to correct this impression in the revisions.

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2) The paper starts by defining transdisciplinarity using a for the context very appropriate definition of Lang et al. 2012. However, the discussion about the aims and obstacles of transdisciplinary research is almost exclusively referencing this source (and not others). This is far away of being a comprehensive literature review adequate for a journal publication. In addition, please explain (briefly) the "ordinary" challenges of transdisciplinary research in a transnational context already at the beginning and not only in the discussion.

Response: Thank you, we again agree. We had written a longer **introduction part on transdisciplinary research,** but had deleted it for reasons of space. We are fine with including additional references and expanding this part somewhat. However, rather than including a comprehensive review on transdisciplinary research, we suggest focusing on main papers from the transdisciplinary field, followed by a review about concrete transdisciplinary projects using MCDA in hydrology, in Africa. This follows the request of referee #1 (point 4c, point 6) and referee #2 (point 1c). We kindly ask for some guidance by the referee and editors: do

you agree with this prioritization, and should we increase the length of the paper with a literature review at all?

We will shortly clarify what we meant with "ordinary" challenges of transdisciplinary projects, or delete if inappropriate for the revised manuscript.

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*3) I would suggest **reducing some of the more biased assumptions** like "lively workshops", "FANFAR project is unique", "unique practice and outcome oriented project", "producing a good flood forecast and alert system" … to prevent the impression of reading a project proposal or advertisement and not a scientific paper. If you want to judge your own project, you would have better stick to an evaluation of the project by other researchers or at least to a survey among participants.*

Response: We are willing to do so.

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*4) My third point questions parts of the structure. In the methods section **I would suggest focusing on methods and tools of conducting and writing the paper** and not on how the FANFAR project and its transdisciplinary methods were implemented. I would rather add another main section called "**Processes of transdisciplinarity**" (or something similar), where the main project's undertakings are described.*

Response: We do not understand what is meant with focusing on "conducting and writing the paper". We think it is important to describe the methods used in interaction with the stakeholders. Describing each step of the problem structuring and MCDA process increases the clarity in our opinion, also to those less familiar with transdisciplinary approaches, and MCDA in particular. However, one idea in response to referees #1 (point 4a) and #2 (point 1b) is to **focus more strongly on research questions**, and re-structure the paper accordingly. We kindly ask the referee and editors for advice on this.

References

Hämäläinen, R. P. (2015). Behavioural issues in environmental modelling – The missing perspective. *Environmental Modelling & Software*, *73*, 244-253. https://doi.org/http://dx.doi.org/10.1016/j.envsoft.2015.08.019

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Voinov, A., Kolagani, N., McCall, M. K., Glynn, P. D., Kragt, M. E., Ostermann, F. O., Pierce, S. A., & Ramu, P. (2016). Modelling with stakeholders – Next generation. *Environmental Modelling & Software*, *77*, 196-220. https://doi.org/http://dx.doi.org/10.1016/j.envsoft.2015.11.016