

Interactive comment on “Analysis of applicability of flood vulnerability index in Pre-Saharan region, a pilot study to assess flood in Southern Morocco” by A. Karmaoui et al.

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30.05.2016, Juan les Pins Dear Reviewer, We would like to thank you for your time and expertise in reading and advise us with the article. All observations and suggestions are adequately addressed. The manuscript has been rechecked to ensure spellings and punctuations are correct. The specific remarks have been marked as following: R1: First of all, I would suggest a simpler title by removing [to assess flood], that is obvious with FVI in the first part.

A: The title have been modified as suggested “Analysis of applicability of flood vulnerability index in Pre-Saharan region, a pilot study in Southern Morocco”. R1: Difficulties with the abstract, which should be rewritten. It has to point out shortly the arguments

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that explain why is it interesting and relevant to apply FVI in this case. In general, the text is quite poorly written, with too long sentences, sometimes incomplete and needs major rewriting for sense and flow. A: The abstract was modified into the manuscript, the relevance of why to apply the FVI was added, as well. Please, see Page 1, Lines 15-20 and 22-24. R1: The introduction has to be reformulated as well. Try to explain better or make more explicit the links what you are deal with. For example, you start with dry lands and droughts. Would it be more efficient just to explain that CC may increase extreme events (like drought and floods) in an area already affected by natural hazards? And then, as floods seem the most impacting hazard, you have decided to focus on it: : . It is often the case that you suggest unclear causal relationship (date palm trees die, but why ? Precise the link with floods, : :). In addition, you wait a bit too much before defining vulnerability. That makes imprecise the employment of this term before (sometimes used in the singular or plural forms). In general, the vocabulary is not enough precise “floods are the most dangerous natural disasters”. Dangerous doesn't suit very well and, moreover, if you mean that in terms of affected people and damages, you have to refer to table 2 (and not only fig 1 and table 1). Before the fig 1, there is a sentence within any previous link. Explain why suddenly you speak about dams. The end of the introduction (the last 8 lines) needs to be clarified and the sequence of tenses (here and in the other part as well) deserves to be considered. A: Thank you for pointing this out. We did revised the Introduction, so changes were done as following: Page 2, Lines: 36, 38, 45-47, 49, 55-57. The unclear relationship with the date palm tree was deleted. The sentences are now shorts and complete. As suggested by the reviewer, we have reported that CC may increase extreme events (like drought and floods) in an area already affected by natural hazards. And then, as floods seem the most impacting hazard, we have decided to focus on it As commented: we have referred “floods are the most dangerous natural disasters” to table 1, table 2 and fig 1 (see the text) Page 2 Line 59 Before the fig 1, we did modified the statement about dams (Page 1, Line 63-65). Also, the latter part of the introduction (the last 8 lines) is modified to make it more scientific (Page 3, Lines 75, 83-85, 94-102).

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R1: Some repetitiveness could be removed (in fact, : :), that easily can be fixed. A: the “in fact” issue was fixed.

R1: In the Materials and Methods section, do you mean “benchmark” instead of indicator in the first sentence? It sounds clearer to me. At this stage, the article is not very well-structured as you find the description of the studied sites and nothing about the materials (the indicators or sources of data you will use: :) or methods. It appears after, in the section “methodology”. This has to be revised and reorganized. Table 3 is useless. Just give this information in one sentence directly in the text, as you did before, with the other examples. In the methodology part, it was not easy for me to link the equation with the three terms (exposure, susceptibility and resilience), which are not defined – and the four components. The table 4 clarifies that, but a description in the text should be given. A: The section Materials and Methods was reorganized. We have added some data on the indicators and the used sources of data. (Page 6, Lines 176-186, 189-190). Page 7, Line 199 - 201 exposed the understanding of Eq. 1 and the base of FVI methodology. Table 3 is deleted as mentioned in the review comment, this information was done in one sentence directly in the text.

R1: In the description of each component by unit (urban scale or sub-catchment), be careful about you use of the vulnerability term (it's only a part of the vulnerability which is highlighted: : the social part, or physical and so on). Concerning the description of procedures, they could still be improved. Page 8, Lines 252-262 shows the description of procedures and aggregation method used for the total FVI.

R1: indeed, they are a bit unclear or some parts are missing; it would be difficult for others to reproduce the study by reading the article. A: This is already done by the previous changes. We believe that now the readers can easily understand the article.

R1: You should precise shortly how you treat the data like the missing values, which kind of aggregation method you used, did you apply some ponderations etc: : : (you will find here some indications from the Handbook on composite indicators provided

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by the OECD/JRC, about how they describe the different steps : <http://composite-indicators.jrc.ec.europa.eu/?q=content/overview>). A: Thank you very much for your suggestion. While creating the methodology this Handbook was considered. We did answer this matter in Page 8, Lines 252-262, where we pointed out why this method does not use weights. Related to the data missing values, this was also corrected into the text in Page 15, Lines 457-460.

R1: Finally, a better description of procedures will help you to improve the discussion. Some study implications or limitations should be clearly presented. A: Dear Reviewer, the limitation of this methodology in these case studies, as we indicated, it is the lack of official necessary data.

R1: Concerning the adaptive measures or recommendations, it is interesting but it could be relevant to know where they come from (experts, literature, ...). A: Two references were added Walker, G., & Burningham, K., 2011 and Khan, M. H., 2001. See text Page 14, Lines 412

R1: The conclusion contains one of the most interesting assertion which should have lead the article : “an accurate assessment of flood vulnerability is difficult, due to the lack of official necessary data.” So how did you manage to surpass this issue? How did you cover the missing data? A: Please see the text in Page 15, Lines 464-469 and Appendix 2 we discuss how we deal with these data.

R1: [and please correct in the text – “data are not data is”: : and “a tool allows”, sometimes you forget the “s”] is it a limitation to apply such index method? : : : A: Page 15, Lines 470-475. Overall, there is no limitation in applying FVI methodology. The FVI can show readily implicit and readily communicated results that can help decision-makers in identifying the most effective measures to be taken. Uncertainty is not removed, but is integrated into the assessment. On the other hand the complexity of FVI methodology is also a negative point, since it takes a long time and good knowledge of the area and the system behind the FVI to be able to implement it. R1:

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Figures and tables are fine. The quality and support text are acceptable, except for the fig 2, the scale is missing and the names are not visible. I would only suggest to remove table 2 and perhaps figure 4, if there is no description attached in the text. Please just pay attention that there is a mismatch between table 2 and 3 in the text. A: Illustrations - Figure 2 is now clear (Page 20, Line 608), the scale was added, as well - Figure 4 (a short description was added, Page 5, Line 152).

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-96/nhess-2016-96-AC1-supplement.pdf>

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