

Interactive comment on “Construction of an Integrated Social Vulnerability Index in urban areas prone to flash flooding” by Estefania Aroca-Jimenez et al.

Anonymous Referee #1

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This paper aims to calculate an Integrated Social Vulnerability Index (ISVI) to flash flood processes in the region of Castilla y Leon in central Spain, considers exposure, sensitivity and resilience. To address the main objective, a set of variables were analyzed using hierarchical segmentation analysis and in the next level by performing a Principal Components Analysis. Tolerance statistic was used as a variable weighting method and in the last step, Latent Class Analysis was performed to identify social vulnerability profiles within the study area.

General comment

I have read the paper with great interest and the main objective addressed by the manuscript is framed appropriately to the scope of the journal, but there is some con-

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fusion regarding to the term vulnerability. Therefore, I think that the paper needs some revisions and I recommend to accept it only after these revisions.

Specific comments

Introduction. In general, vulnerability in the context of natural hazards is a broad term, which covers different dimensions from physical to social approaches. In this line, it is important from the authors to give a clear framework of the vulnerability concept used in this study. Try to explain better or make more explicit the links what do you deal with. For example, it is not clear to me what the authors understand as vulnerability, integrated vulnerability and the components influencing vulnerability. In this part and in order to avoid confusion, I would suggest the authors to clearly indicate what they define as vulnerability in the context of the existing frameworks as well as a clear definition of the terms exposure, sensitivity and resilience.

Materials and Methods. The study area is well described. The methodological outline is well described and the method sounds scientifically correct (I am not an expert on statistics). I would suggest the authors to make figure 2 more simple by reducing some information that is presented on the text. Moreover, it is not entire clear to me, why the authors used a low probability scenario and not scenarios with medium or high probability. In page 5/line 6, I would recommend the authors to create a new sub-chapter with the database generation. Moreover, I would suggest them to describe a bit more the data used and to give some more information about the surveys done (i.e. telephone calls and/or personal research). Additionally, on the construction of the Integrated Social Vulnerability Index (part 2.2.4), I would recommend the authors to describe a bit more the idea behind the equation's modification from the original one presented by Frazier et al. (2014).

Results. In general, I would suggest the authors to describe only their results to this part and to remove some parts describing methods (i.e. page11/ lines 1-5 or page 12/ lines 5-6) on the methodology part as well as some parts discussing their results (i.e.

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page 16/lines 11-13) to the discussion part. On figure 3, I would suggest to add the description of the variables to increase reader's friendliness.

At the end, the conclusions presented are too general and do not reflect what exactly shown in this study. Conclusions based on the findings of the analysis presented would be more effective.

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