

Interactive comment on “The spatial dimension in the assessment of socio-economic vulnerability challenges for an application on an urban scale, a systematic review” by Diana Contreras and Alondra Chamorro

Anonymous Referee #1

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Using one of the leading databases on scientific journal publications, the authors performed an assessment of articles published between 2008 and 2018 addressing the social and economic dimensions of vulnerability. From originally 235 articles, 21 were finally chosen for a detailed analysis. However, while the authors initially stated to undertake a systematic review for an application on an urban scale, the results and conclusions do not necessarily mirror this aim. From their final choice of contributions, the main conclusion of the authors is that for assessing social vulnerability it is not sufficient to only compute a specific level of vulnerability, but also to include other spatial

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information available in order to avoid the modifiable areal unit problem (e.g., Unwin 1996).

Overall, the manuscript has major shortcomings which will be exemplarily addressed in the following list:

- The overall choice of keywords and exclusion of other keywords results in the fact that many studies addressing social vulnerability and/or economic dimensions of vulnerability have not been considered by the authors, which in turn restricts the overall conclusions possible.
- The time period covered is not justified.
- The overall aim to provide a structured overview on studies and indicators, which is not only promised in the title of the contribution but also in the introduction, is not mirrored by the main text body. Materials, methods and findings are rather compiled in a very unstructured way which makes a structured conclusion quite challenging.
- The authors further argue that the economic dimension of vulnerability is the predisposition for the loss of economic value (page 2, lines 15/16), which according to my experience is exactly the contrary relationship – also here we do have scholarly articles which did not make it to the current overview. One reason is again the choice of keywords (see below).
- In the introduction it becomes not clear which specific research question should be answered, and where the niche and the gap for the contribution is to be found. Paragraphs addressing common sense are somehow not connected to those showing specific issues; to give an example it remains unclear why paragraph 3 immediately starts with the SoVI as one of the indices available to assess social vulnerability. On page 3, line 18 the authors even conclude (or state) that only few authors have elaborated on the spatial dimension of social vulnerability, which is wrong if a proper literature research would have been undertaken. There are lots of studies around on this topic, some of

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them even in the target journal NHESS. Moreover, the statement that spatial vulnerability assessments only became prominent after the 2004 Indian Ocean Tsunami is neither proven by references, nor true according to my own knowledge. Further, the use of GIS is not only very suitable for assessing spatially the issues of social and economic vulnerability, it is a tool to exactly do this. Finally, the statement that vulnerability is dynamic and subject to spatial and temporal dynamics across scales is not very innovative, there are even specific research papers on this topic from the period 2008-2018.

- Methods: it remains totally open how the amount of 235 papers initially identified was reduced to the final set of 21 contributions. Moreover, searching only for combinations of “social vulnerability” excludes the amount of (valuable) papers around addressing multiple dimensions of vulnerability – and some of these contributions again can be found in NHESS. Further, the authors state in the text that they excluded terms such as “climate change”, “health” and “crime analysis”, whereas in Figure 1, much more terms have been excluded. BTW: Why has the term “debris” been excluded? Just to give an example, many studies on (social and economic) vulnerability are related to dynamic flooding such as flash floods and debris flows/torrential hazards (even the mentioned EU-funded project MOVE), these are completely ignored by the authors due to their choice of key words.

- In contrast, some of these hazard types are then mentioned in the results section (page 7, second paragraph).

- Instead of showing which contributions used which methods or indicator groups for assessment, the authors could have shown the challenge of indicator interdependencies, one of the main points of criticism for the SoVI. Simply applying the SoVI does not necessarily result in an overview on social and economic dimensions of vulnerability because of the inherent dependencies between indicators.

- In the discussion section the authors have raised some issues that remain ques-

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tionable, such as the fact that most of the articles related to flood hazard and social vulnerability have been written by geographers because they may be interested in environmental vulnerability.

These issues are just examples underpinning the overall judgement that this contribution is so far not up to international standards. Although the authors have some interesting arguments, I believe that the manuscript needs further improvement to bring it up to an acceptable level before it can be accepted for publication. To summarise, it is not clear why the authors chose specific keywords and excluded others, it is not clear why the authors chose the distinct time period between 2008 and 2018 (the discussion on multiple dimensions of vulnerability and the spatiality of vulnerability is much older). The results are not presented in a logical and organised manner, and the conclusions are not underpinned by the results, some of them seem rather driven by speculation than by evidence.

Therefore, I cannot recommend publication at the current state.

Reference mentioned:

Unwin DJ (1996) GIS, spatial analysis and spatial statistics. *Progress in Human Geography* 20 (4):540-551. doi:<https://doi.org/10.1177/030913259602000408>

Interactive comment on *Nat. Hazards Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/nhess-2019-147>, 2019.

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