Natural Hazards
and Earth System
Sciences

Discussions

Interactive comment on "Spatialised flood resilience measurement in rapidly urbanized coastal areas with complex semi-arid environment in Northern Morocco" by Narjiss Satour et al.

Narjiss Satour et al.

narjiss.satour@gmail.com

Dear Jorge Leandro We are deeply grateful for all the relevant remarks, interaction and the time you allowed for reading our article and giving us positive and constructive feedback. Please find bellow answers on your comments. We added your suggestions references to the text and followed your remarks.

- Including flood data or flood simulation "My major concern is related with the fact that the study is solely based on geographical data excluding flood data. Event dough the focus is on flood resilience; resilience is not based on flood data or flood simulation. In my point of view, this is an important drawback that needs to be addressed in several

sections of the manuscript (including abstract and conclusion)"

Regarding the major concern of using "solely a geographical data excluding flood data", we totally agree with the fact that including a flood or meteorological data is highly important and will give more authenticity. Unfortunately, there is no available data or flood map at the area of the study. However, we used the flood risk hot spot area geolocalisation, data we got from the official sources (Hydraulic Basin Agency- ABH 2016) to calculate the distance from depression parameter (DD). Recent references figuring out on the text (Karrouchi et al., 2016 and Taouri et al., 2017) described and discussed the flood phenomenon. And more extensive works focusing on mutihazards risk (Satta et al., 2016) and sea-level rise (Snoussi et al., 2010) and (Niazi, 2007) were helpful. Nonetheless, your proposition about mentioning the drawback in sections of the manuscript will be taken into account.

- Introduction "In the introduction, a paragraph needs to be added on re-silience and its dimensions. Particular the physical dimension, is often quan-tified based on physical indicators such as flood depth or flood duration (https://doi.org/10.1016/j.watres.2015.05.030, and https://doi.org/10.3390/w11040830) extracted from flood simulation data. The advantage of the latter reference is that re-covery (one important stage of resilience) is time variable and can last longer that the flooding event itself."

For the resilience dimensions, we will add a paragraph (Line 95-107) and the suggested references (Line 101-102). The second paragraph in the introduction should be com-plemented with studies on existing climate change adaptation focusing on resilience. Other references will be added accordingly in the revised Manuscript.

- Limitations "Also a section on the limitations of the method presented should be added. This should state the drawbacks of an approach that does not consider real/simulate flood inundation maps. For example, the index of Elevation, would not be necessary. Since the flood routes would be captured by the flood maps. Those

would reveal that some low lying areas may be not so flood prone than high lying areas because they may or may not lay near to a flood route."

Drawbacks and limitations of the method and data used will be discussed in the conclusion. (Line 452-431)

"Also I am unsure (line 192) what is meant with dam area. Is a dam area a flood risk area? If we consider that connection to a sewer system is enhancing our resilience why is a dam area the opposite? As far as I understood, there is no failure mechanism in this work, hence both should tend in the same direction."

The designation "dam area" is the flood risk area as you mentioned. We used data we got from the official sources (Hydraulic Basin Agency- ABH 2016) to calculate the DD. This will be highlighted in the revised form of the Manuscript.

"One particular section I liked was 3.5. It includes a sentence relating risk and resilience. Are they really opposite? Perhaps the Authors could extent that paragraph. A recent paper discussing that point has been recently published and may be worth discussing here (https://doi.org/10.1016/j.wasec.2020.100059)."

The authors would like to explore the correlation between resilience and risk in the context of the cross-validation step. However, the "opposite" correlation depends on the spatial and temporal scale. Resilience is locational and context-specific. Otherwise, the relationship may "not be opposite" in case of another geographical area. Or the same geographical area, with more or another database or resilience assessment methodology. The relationship between risk and resilience worth discussion in the academic literature. The reference suggested and others will be added to the Manuscript. Thank you!

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