

# ***Interactive comment on “Towards Measuring Resilience of Flood Prone Communities: A Conceptual Framework” by Victor O. Oladokun and Burrell E. Montz***

## **Anonymous Referee #2**

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This manuscript contributes to broad research field on community resilience and aims to develop framework on measuring resilience. After examining and discussing the challenges of different definition and concepts in this context, the authors presented a conceptual and mathematical model as well as applied a fuzzy logic approach to generate a resilience index, which was applied in three flood-prone communities in the US (North Carolina and Virginia).

The manuscript is in general well written but the structure and the different level of information provided in the sections challenge the reader to follow the argumentation of authors and relate the different parts of the framework. For example, the introduction

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provides a selected overview on the topic and challenges of community resilience and different frameworks to measure resilience. However, the focus is on different definition of resilience and not on the differences in approaches to measure resilience, which are only mentioned but not explain. I see here a high potential to reduce the definition discussion and provide more details on measuring resilience. Moreover, I suggest to present also a clear objective for the study, which would help to follow the structure of the manuscript. Perhaps a flow chart showing the interrelation of the different models would also increase the understanding of the chosen structure. Furthermore, in the design of the model (also including Fig. 1) it is not very well explained why resilience leads than to recovery, as one part of resilience would be ‘how the community is able to recover?’ and thus this parameter should contribute to measure resilience.

The authors illustrated in section 2.5 some extreme cases and showed the gained insights to model structure, however it also shows the limitation of the model regarding dynamical change, e.g. if you consider in case 1 that you have no efficiency in the resource utilization processes = no resilience, then your model ignore any preparedness and coping capacity. I would agree on a long term but you measuring only in static manner, thus should not there be a difference of communities with different hazard absorbing capacity? The authors are also encourage to provide more thoughts about their assumption of that ‘negative’ resilience is another expression of vulnerability.

The structure of section 3 is confusing because in the beginning it is not clear why the fuzzy logic is addressed and how it is related to the previous sections. Furthermore, from 3.2. onwards more detailed information on chosen criteria for selecting variables, number of rules, type of membership functions, weights ... are needed. Currently, in this section a lot of questions arise, but I see a high potential to improve the whole manuscript if you revise this section (see detailed remarks in the attached file).

In general the application in case study is only a very vague description and it is not clear on which assumption you based your hypothetical input score. I also would see an added value - if you stay with hypothetical inputs - to gain more insights on

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the sensitive of your model with systematically testing of different input data but also on the rule setting and membership functions. The added-value would be a better understanding of model. The discussion and conclusion is very generic and needs to be rewritten regarding the points highlighted in the introduction, the (missing) objectives and the gained insights. I indicated different ways how the authors may restructure and rewrite the manuscript to show the added value of this study to the readers and scientific community. See detailed comments in the attached file.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-217/nhess-2018-217-RC2-supplement.pdf>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-217>, 2018.

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