

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1
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Comment on nhess-2021-8

Anonymous Referee #1

Referee comment on "Bangladesh's vulnerability to cyclonic coastal flooding" by Aurélia Bernard et al., Nat. Hazards Earth Syst. Sci. Discuss.,
<https://doi.org/10.5194/nhess-2021-8-RC1>, 2021

This review article aims to develop a metric to define coastal vulnerability induced by cyclonic hazards in Bangladesh. The vulnerability was defined in terms of physical infrastructure, social and cultural factors, and economic factors. The manuscript is well-written in general. However, the results obtained in this study are nothing special from the nature of coastal Bangladesh, mostly known from various studies. I have a few major observations which I would like the authors to address diligently before it can be considered for publication. Of particular concern is the motivation for carrying out such a study, as well as, its contribution to the existing scientific literature. More specific comments are given below:

- I am surprised to see that several important recent studies were not included in this study, given a systematic review was done. A few examples are given below. I feel the incorporation of these studies will strengthen the motivation and validity of this article:

<https://doi.org/10.5194/nhess-19-353-2019>

<https://doi.org/10.1016/j.scitotenv.2019.05.048>

<https://doi.org/10.1016/j.landusepol.2020.104868>

https://doi.org/10.1007/978-3-319-71093-8_16

<https://doi.org/10.1007/s11069-017-3027-8>

<https://doi.org/10.1007/s41748-018-0034-1>

- The coastal region of Bangladesh is subject to multiple types of flooding such as pluvial, fluvio-tidal, and cyclone-induced storm surge flooding. Cyclonic flood events in this region are usually accompanied by pluvial flooding. Flood vulnerability tends to change with an increase in the complexities of flood events. In this manuscript, the authors have not discussed the complex coastal flooding processes and associated vulnerability in Bangladesh. They could consult some of the articles suggested above.
- Section 4.1: The methodology for selecting articles is not clear. First, I am not convinced with the inclusion of Google Scholar as one of the search engines as it tends to include articles that are not scientifically valid. How did the authors ensure that whether articles obtained from Google scholar are peer-reviewed or not?
- The authors said that "This review excludes non-peer-reviewed articles, in the aim to obtain a state of the art's review of the current knowledge extracted from scientific literature only, to make sure of high scientific quality standards in the selected articles". How did they define "high scientific quality standards"? This comment does not apply to articles obtained from other search engines.
- I believe the authors found many articles from the initial search. How the 49 articles were selected? What were the exclusion criteria? The authors need to clarify in their manuscript. Appendix A1 only included the inclusion criteria.
- Bangladesh has a long history of implementing various flood adaptation and prevention measures against various coastal flooding. Coastal embankments are the well-known flood protection measures that have been adopted in Bangladesh. Existing studies have quantified the effectiveness of such measures against complex coastal flooding including cyclonic flood events. This article significantly simplifies the actual coastal flood processes. The authors need to discuss how the adoption of various flood interventions alters flood vulnerability in the coastal region.
- Line 454-455: According to this study, the length of dykes and embankments is negatively correlated with cyclone vulnerability. But the following study provided various evidence indicating that such embankments were less effective against historical cyclonic flood events. Moreover, these measures promoted associated pluvial flooding. The authors need to justify the selection of various factors used in developing the vulnerability metric.

<https://doi.org/10.1016/j.scitotenv.2019.05.048>

- Similarly, the capacity of shelters was perceived to be negatively associated with cyclone vulnerability. However, results from various studies indicated that various social factors are associated with the use of shelters during a cyclone event. During several events, people were reluctant to use cyclone shelters Please see the following study:

<https://doi.org/10.1111/disa.12062>

Such a scenario creates uncertainty in the obtained results. The authors should include a discussion on uncertainties related to the factors considered for the vulnerability metric.

- Section 6.1: This section lacks in critical discussion of the obtained results. The authors need to discuss how their findings are similar or different from the results of various existing studies.
- Finally, the motivation for carrying out such a study needs to be very clear. The authors mainly argued that “Thus, more than developing a new vulnerability concept, the novelty of our study lies in the methodological adaptation of existing approaches, like social vulnerability index (Flanagan et al., 2011), to the specific cyclone flooding context.” I feel this is not enough. The authors should clearly identify the gaps in the existing literature and explain how this study addresses those gaps.