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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Understanding Spatial Variations in Earthquake Vulnerabilities of Residential Neighborhoods of Mymensingh City, Bangladesh: An AHP-GIS Integrated Index-based Approach" *by* Md. Shaharier Alam and Shamim Mahabubul Haque

Anonymous Referee #2

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This manuscript proposes a method to study the spatial variability of the Earthquake Vulnerabilities in the city of Mymensingh using different parameters: geological, social, economic and structural. A hierarchical method (AHP) is used to assemble these 23 different indexes, by associating a weight to each parameter with the help of three experts. The results of this work are compared using a similarity method to the earthquake sensitivity map for Mymensingh developed by CDMP-II (2014) and and Sarker et al. (2009).

The aim of this work is to study the "Earthquake Vulnerabilities" but both in the abstract both in the paragraphs of paper it is not clear if it refers to the vulnerability, hazard or risk. The 23 indexes used in fact belong to different aspects of the risk. The authors choose to use some parameters and justify the non-use of others saying that they are not available in Mymensingh city. The method seems tailored to the database already used by authors (Alam & Haque, 2017) and not on the basis of how much represent the event studied.

The result of this work provide relative (not absolute) value of seismic vulnerability, and not quantify nor the number of people involved nor the possible fatalities caused by a seismic event; for these reasons it cannot be considered a risk assessment. At the same time the result cannot be defined a hazard assessment, since elements of structural vulnerability of buildings and social vulnerability are taken in account. The indexes with major weight are the geo-logical parameters, PGA and soil type, and that are referred to the earthquake hazard assessment.

The model proposed in this manuscript does not represent an advancement for the scientific community. First of all, the authors have to decide which aspect of the risk they want provide: hazard, vulnerability or risk. Secondly, the AHP and WLC methodology together with the use of GIS have also already been used in other works and the only novelty, also highlighted by the authors, is the use of low-cost data.

Some parameters belonging to vulnerability of buildings are "strange", in particular the height of the buildings is normally a parameter that indicates a better construction technique and therefore a better ability to resist a seismic event. Parameters as "Pounding", "Irregular Shape" and "Building and Heavy Overhanging" in Mynmensingh, where 87% of the buildings have only one floor (Alam & Haque, 2017) look trivial. As already mentioned, the choice of some parameters seems to be made only on the basis of the available database.

There are some text editing errors in the paper, for example: line 20, reseach; line 79,

counties; table 3, stroye.

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