

Interactive comment on “Flood Vulnerability Assessment of Urban Traditional Buildings in Kuala Lumpur, Malaysia” by Dina D’Ayala et al.

Anonymous Referee #1

Received and published: 24 April 2020

The authors develop a flood vulnerability method for the assessment of traditional residential buildings in Kuala Lumpur. The study includes a survey of 163 buildings using different building-level vulnerability parameters. This is a very interesting topic that contributes to the recent increase in studies looking at flood vulnerability, damages and mitigation measures at a building level, and it fits very well within the scope of NHSS. In my view, the paper would benefit from an improved explanation of the methods, mainly the parameter selection and valuation, and the findings regarding the vulnerability index (as discussed in more detail below).

Broad comments

- L. 185: what is the proportion and how was it determined? - Section 2.4: I miss a link between (some of) the parameters mentioned in table 2 and the way they impact a

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building’s flood vulnerability. For example, I understand how footprint influences damages, but how does it link to vulnerability of a building? How does the surface condition link to the vulnerability of a building? The surface condition (permeability / infiltration rate) is commonly perceived as part of the hazard rather than vulnerability (e.g. Liu et al (2014))? It would be good to explain how each of the selected parameters contribute to vulnerability and how you differentiate the extent to which they contribute to vulnerability for each of these parameters. - Section 2.5 (Table 3): many flood building studies differentiate between 1 storey and 2 storeys (e.g Deniz et al. (2016); Enghardt et al. (2019)). Is it realistic to differentiate between an inundation depth up to 3 storeys and 4 storeys or more? Especially because you state that “the maximum inundation depth due to flash flood for a 100-year return period is around 0.2m”. - Section 3.1 could be improved by expanding the analysis of the index. E.g. L. 415 states that a normal distribution can be observed from fig 7a. This is not clear and needs to be elaborated on in the text as well as in the figure and its caption. L. 417 states that the total VRi follows a lognormal distribution, while in fig 8 it follows a normal distribution. Next, the caption of 7 mentions “VI”, should this then be “VR”? - I think it is very important to emphasize that you are calculating the relative vulnerability. I was initially expecting the vulnerability classes to be categories within the range of 110 (the overall possible minimum) to 1100 (the overall possible maximum). Please elaborate in paragraph at L.320 why this decision was made. - The percentages of the sample column of Table 4 do not add up to 100%. - The abstracts states that: “The paper discusses these in relation to a scenario event of 0.1% Annual Exceedance Probability (AEP), based on hydrological and hydraulic models developed for the Disaster Resilient Cities Project.” However, I can’t find a mention of this in the body of the manuscript.

Minor things:

- L. 48 “control”: not clear what is meant here. - L52 “. . .political negotiation”: these statements look stronger when backed-up with (a) reference(s). - L. 54 maybe include some examples of “Non-structural measures” that provide “faster flood mitigation”. -

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L. 63 “UNDRR”, write the actual name when using the acronym for the first time. - L. 81-83: please add page number(s) of the direct quote (or paraphrase). - L. 89: it would be good to add a reference for the definition of vulnerability. - Figure 2: maybe crop the high rises from 2b so the focus is on the vernacular house. - It may be nice to add a map (or add it to fig 2a) showing the locations of the gauges. - L. 207: along river network of the study area -> the river network - L. 262 (“..by building type”): it would be good to include some references to support this statement. - L. 352 “2415 to 4105 RM (525 to 890 €)” -> it would be very useful to add the euro value to each mention of an RM value. - L. 364: typically ranges - L. 408: number of storey -> number of storeys - Fig 7a and L. 415: it is unclear from figure 7a which of the variables represents the roof height. In general, this figure deserves a little bit more explanation and probably best to update the labels with the wording used elsewhere for each of the parameters (same holds for other figures such as fig 10). - L. 424. “and smallest” -> and the smallest - L. 424 “The largest VR is 852.5, and smallest is 477.5.” Refer to table 4. - L. 461 “3 different scenarios” -> three different scenarios - L. 474 “total number of building” -> buildings - L. 475. “the total building” -> total number of buildings - Fig 11b caption: SAMRT -> SMART - L. 478: the -> The - L. 483 “without SMART Major losses” -> major - L. 483 “concentrate” -> concentrated - L. 487 “was assessed to have” -> was found to have - Fig 12. The double y-axis is fine, but maybe adjust the colours to improve legibility (e.g. in 12a, the number of flash-flooded buildings and the cumulative graph are around a water depth of 0.1- 0.3 are difficult to decipher). - L. 499. Flood has become a major hazard worldwide. -> better to add a reference for this statement. - L. 501. The word “dearth” is a bit archaic, maybe better to use “lack of” or “limited” - L. 533 “varying the % of run off” -> percentage of run off

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-96>, 2020.