

Interactive comment on “Review article: Natural hazard risk assessments at the global scale” by Philip J. Ward et al.

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Received and published: 20 February 2020

We would like to thank you for taking the time to provide your valuable short comment on our paper. In the text below, we respond to each comment one by one.

(1) In terms of the exposure of earthquake (line 426), some important progresses are neglected and strongly encouraged to be added (Djordjevic et al., 2016; Pesaresi et al., 2017). We thank for the reviewer for the comment and suggested literature. We will clarify in the revised manuscript that the references included in the table are those that do not use the index-based methods or overlays of a single hazard map with exposure data (e.g. population, GDP) to assess global exposure to earthquake hazard. However, propose to add these references to the Supplementary Information in the fol-

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lowing sentence: “Several global assessments used index-based methods or overlays of a single hazard map with exposure data (e.g. population, GDP) to assess global exposure to earthquake hazard (e.g. Davidson and Shah, 1997; Cardona, 2005; Hopkins, 2009; Peduzzi et al., 2009; Cardona and Carreño, 2011, Djordjević et al., 2016; Pesaresi et al., 2017)”.

(2) For the future studies on the changes (dynamics) of exposure at the global or regional scale, the deficiency on this topic for geological hazard will also be an interesting opportunity (line 705, section 4.2). For example, the changes in population exposure to earthquake hazard have revealed that urbanization and related migration played an important roles in increasing the number of vulnerable people to earthquake hazard in Asia (Dou et al., 2018) and in China (He et al., 2016; Huang et al., 2019). I believe that these progress would be important in the context of global urbanization and SDG11 (sustainable cities and communities). We thank the reviewer for highlighting these very interesting papers. There are indeed studies at local, regional, and continental scales that show this important signal across different hazard types. Unfortunately, we are unable to include all of these references in the manuscript due the focus on global scale models – expanding to all regional scale assessments would make the paper prohibitively long.

References cited by the reviewer or in our response to the reviewer – Djordjević, M., Radivojević, A., Dragović, R., Filipović, I., 2016. Exposure to earthquakes – distribution and change of the world’s population with regard to disposition of seismic activities. *J. Geogr. Inst. Cvijic.*, 66, 353-370, doi: 10.2298/IJGI1603353D – Pesaresi, M., Ehrlich, D., Kemper, T., Siragusa, A., Florczyk, A.J., Freire, S. and Corbane, C., 801 2017. *Atlas of the Human Planet 2017.* – Dou, Y., Qingxu Huang, CHunyang He, Shiting Meng, Qiang Zhang, 2018, Rapid Population Growth throughout Asia’s Earthquake-Prone Areas: A Multiscale Analysis, *International Journal of Environmental Research and Public Health*, 15(9): 1893 – He, C., Qingxu Huang, Yinyin Dou, Wei Tu, Jifu Liu, 2016, The population in China’s earthquake-prone areas

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has increased by over 32 million along with rapid urbanization, *Environmental Research Letters*, 11: 074028 – Huang, W., Shiting Meng, Chunyang He, Yinyin Dou, Qiang Zhang, 2019, Rapid Urban Land Expansion in Earthquake-Prone Areas of China, *International Journal of Disaster Risk Science*, 10(1): 43-56

Interactive comment on *Nat. Hazards Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/nhess-2019-403>, 2019.