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Reply on RC2

Yen-Lien Kuo et al.

Author comment on "Are the Rich less Prone to Flooding? A Case Study on Flooding in the Southern Taiwan during Typhoon Morakot and Typhoon Fanapi" by Yen-Lien Kuo et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2022-38-AC2, 2022

It is intuitive that the motivation is the flood risk reduction in their residing areas when the local governments decided the priority and the allocation of public flood protections. However, the advantage of high income people and their political power is difficult to prove because that works under the table. We can only prove that through the outcome. We used the lowest administrative entity (villages) during extreme typhoon cases to have the data on residents' income and large sample size. Since we need widespread flooding to do this empirical study, the non-extreme typhoon cases are not suitable. Extreme cases seldom happen. Currently, we did not have the flooding probability of villages before the project. However, this study did proof that those 2006 high income (10%) villages had less flooding probability than 2006 non-high income villages during 2009 and 2010 typhoons in Southern Taiwan. Therefore, the topic of this paper can be changed to 'Are the Rich less Prone to Flooding during Typhoon Morakot and Typhoon Fanapi in the Southern Taiwan?'. I may point out this research limitation at the end of this paper.

The budget was mainly for structural flood protection, such as levees, pumping stations, and detention ponds. Almost all rivers already had some sort of levees before the project. Due to the Project, the local governments decided the priority and the allocation of enhancing levees and building detention ponds. The decision process had been described in the manuscript. The content of the Project can be added to the manuscript.

In Taiwan, the flooding is mainly inundation which is caused by extreme rainfall and insufficient drainage rather than river flooding. Even during extreme typhoons like Morakot and Fanapi, most of the casualty was not from flooding (mainly because of landslides). In Taiwan, seismic safety is emphasized in the commercials of high price buildings rather than flood prevention because the drainage is managed and regulated by the government.

We put the house price in the model and the hypothesis of that is negative because the house price is usually adopted to measure the benefit of public flood protection measures called the hedonic price method. It is a mechanism of cost-benefit analysis which leads public flood protection to the areas where high price buildings are located. Since the risk reduction efforts toward more population and high real estate price areas are democratic and economic (cost-benefit analysis) mechanisms, respectively, rent-seeking is the most possible mechanism.

The data sources of flooding investigations of those two typhoons were stated in the manuscript. The process of flooding investigation is that the flooding locations (point) were reported by residents and then the investigation team of each city/county went to check and plotted the flooding area. However, since each team had a different format of records, the flood depth was not recorded in some cities/counties (only areas). The minimum recorded flood depth is 20cm from the team that recorded flood depth. The recorded flood depth will be added to the manuscript. In line 107 of page 4, all villages in Pingtung county, Kaohsiung city, and Tainan city were adopted in this study. There is no criteria for the inclusion of villages. The altitude (elevation) and slop were adopted to control the nature of villages.