Response to CC3 Comments

Dear Dr. Song,

We highly appreciate your valuable comments and suggestions. It has greatly improved the quality of our manuscript.We have made revisions one by one according to your comments and suggestions.

The answers for the suggestions and comments are as follows.

Q1: The title, e.g., vulnerable population in the urban society: a case study in Wuhan, China, covers too much scope, which should be revised. This is because there are lots of kinds of disasters, as the authors mentioned. I suggest using the title: Identifying the vulnerable population in the urban society with flood disasters: A case study in Hongshan district of Wuhan, China.

Authors' responses:

Thanks for your valuable suggestions.
We have revised the title to: "Identifying the vulnerable population in the urban society: A case study in a flood-prone district of Wuhan, China", not mentioning the place name of Hongshan that is not so famous worldwide, but giving the place's feature to show a flood as a focal hazard.

Q2: In the abstract, the authors describe the findings of this investigation. Most finding of this investigation in the abstract can be figured out or guessed, even without conducting this investigation. Thus, it may be helpful to present some results quantitatively. For example, presenting central data in Table 5 in the abstract section is useful.

Authors' responses:

Thanks for your valuable suggestions.
Based on your suggestion, we have made revisions to the abstract. The results show the close interrelationships between different types of communities in terms of physical and built environments, and different levels of social vulnerability to disasters. The group of high vulnerability accounts for 12.9 percent of the 599 samples investigated, the group of medium vulnerability for 48.4 percent, and the group of low vulnerability for 38.7 percent. The higher vulnerability groups have the characteristics of low education, poor health, low annual income, unstable work, and insufficient social security. The quantitative understanding of the dissimilarity in the degree of social vulnerability between different communities and populations is of great significance for the reduction of social vulnerability and disaster risk specifically and pointedly.

Authors' responses:

Thank you very much for your valuable suggestions. We have added explanations to Figures 4-6 to help readers better understand the information the figures are trying to show, as follows:
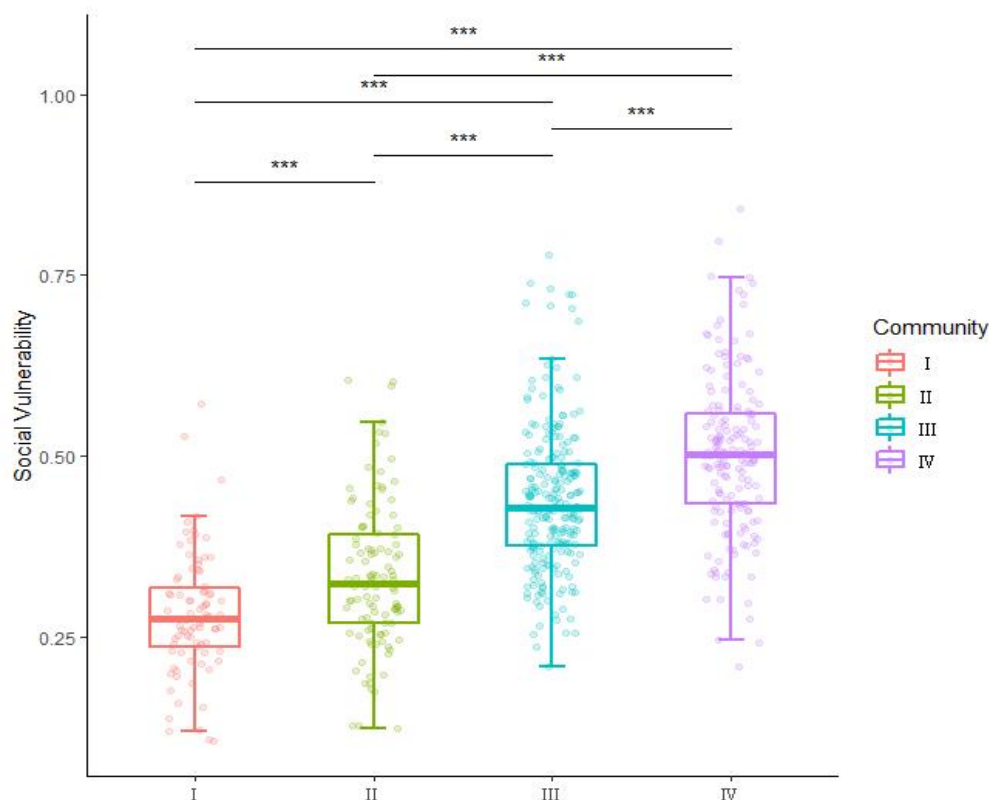

Figure 4. Social Vulnerability Box Plot of 4 type communities. The boxplot in is used to represent the central location and distribution range of vulnerability data for the four types of communities, and to compare them. The four colors represented in the legend represent four different community types, each consisting of multiple communities (see Table 1). There is a line in the middle of the box, representing the median of the data; The top and bottom of the box are respectively the upper quartile (Q3) and the lower quartile (Q1) of the data; The top and bottom lines represent the maximum and minimum values of the group of data, respectively. Some points distributed outside represent outlier in the data. This figure can not only show the distribution, outlier, fluctuation and stability of each type of community vulnerability, but also compare the difference of distribution and value of different types of community vulnerability. *Note*: p < .01*** (= .000)
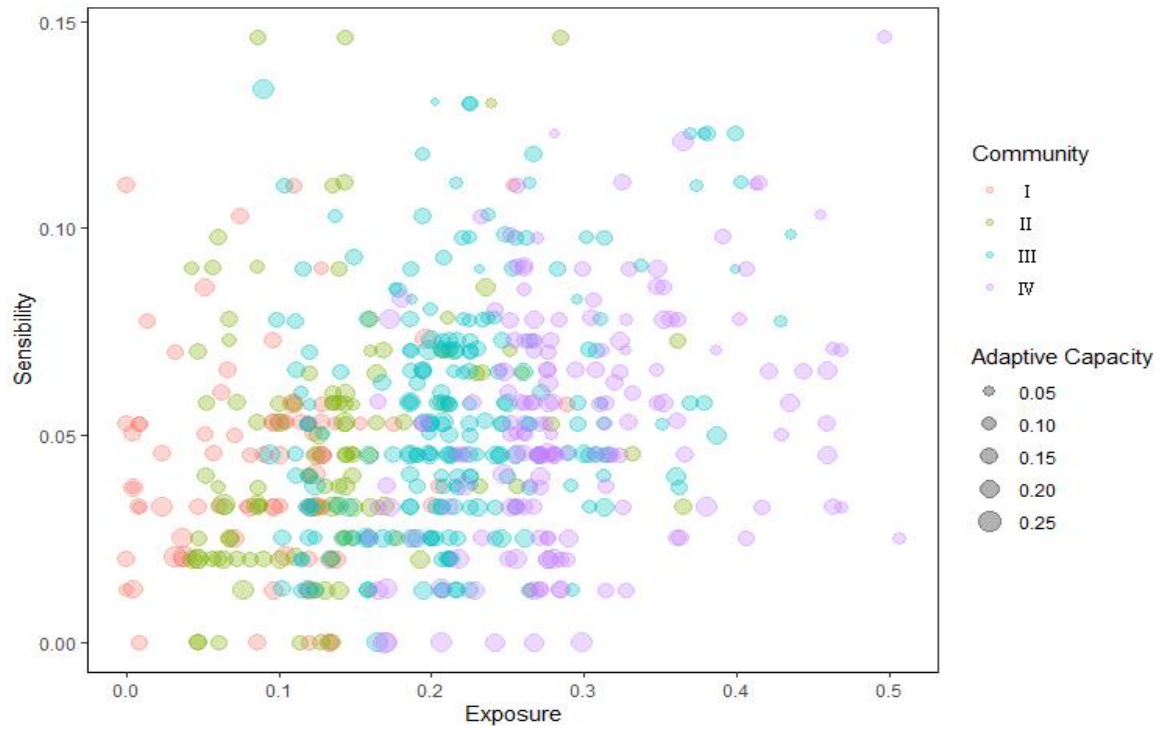
Figure 5. Exposure, sensitivity, and adaptive capacity of four types community. The bubble chart shows three variables (exposure, sensitivity, and adaptability) for four types of communities. Exposure and sensitivity correspond to values on the *X*-axis and *Y*-axis, respectively, and adaptability is represented by the size of the bubble. The four different colors in the legend represent four types of communities, and the dot size is used to explain the size of adaptability. Through Figure 5, not only can the overall exposure, sensitivity, and adaptability of the study area be displayed, but also the differences in exposure, sensitivity, and adaptability of different types of communities can be compared.
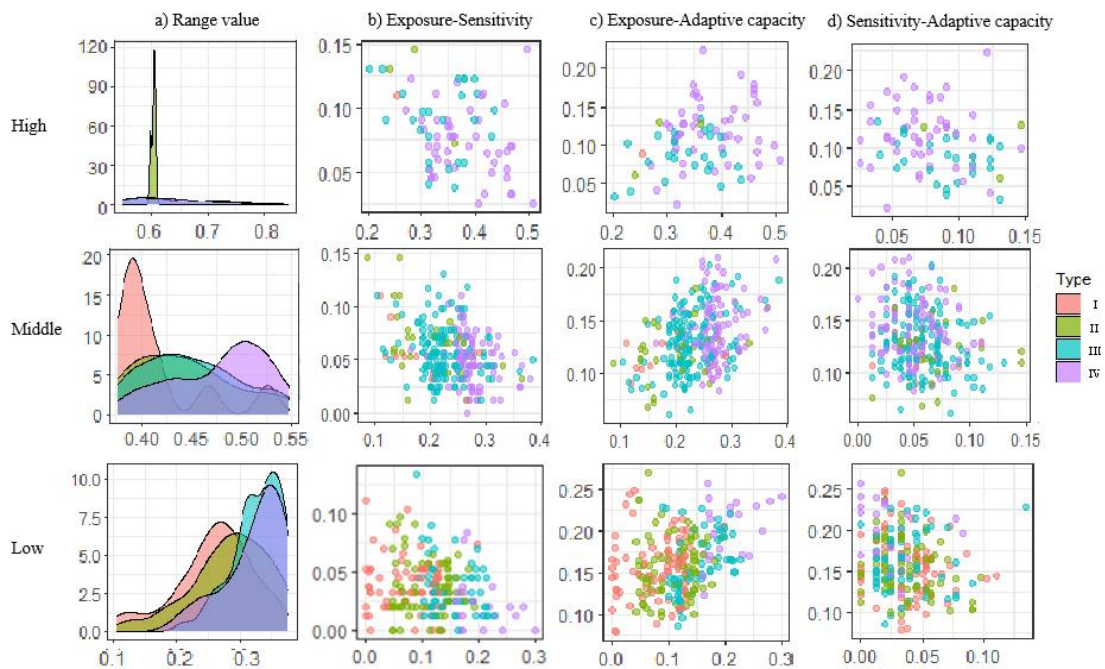

Figure 6. The distribution and characteristics of high, medium and low-level vulnerability. The figure

horizontally represents the distribution of high, medium, and low vulnerability populations in the four types of communities. Vertically, a) Range value is the nuclear density curve of the vulnerable population, with a higher peak indicating a more concentrated level of vulnerability (with smaller differences in vulnerability). Conversely, a lower peak indicating a more dispersed level of vulnerability (with larger differences in vulnerability). At the same time, the concentration range of its vulnerability values can be determined; b) Exposure-Sensitivity represents the correlation between the exposure and sensitivity of vulnerable populations in the four types of communities, with the X-axis indicating exposure and the Y-axis indicating sensitivity; c) Exposure-Adaptive Capacity represents the correlation between the exposure and adaptability of highly vulnerable populations in the four types of communities, with the X-axis indicating exposure and the Y-axis indicating adaptability; d) Sensitivity-Adaptive capacity represents the correlation between sensitivity and adaptability of vulnerable populations in the four types of communities, with the X-axis indicating sensitivity and the Y-axis indicating adaptability.