

Response to the Anonymous Referee #1

General Comments. The manuscript developed a new food protection dataset for China based on the relevant policy and multi-source data. Such a dataset is urgently needed as it is a foundation of reliable flood risk assessment and effective risk management, but scarce in reality. This dataset revealed how an area should be protected according to the relevant policy. Thus it helped to identify the potential social divergence and the vulnerable groups in terms of lower flood protection. There is a limited amount in the literature on this topic, so it fills an important gap. The manuscript is generally well written and interesting. Specific comments are as follows.

Accepted: Thanks for confirming the relevance of our manuscript and the suggestions for further improvement. We have thoroughly revised our paper, addressing your valuable comments and suggestions.

Specific Comment 1. Lines 12-13. The validation can only reveal that the policy-based FPLs is a reliable proxy for the actual FPLs in Chinese case. It should be with caution to extend the conclusion.

Accepted: Thanks for this suggestion. We have revised the sentence. Please check from *line 12 on page 1*. Now it reads as:

This suggests that the policy-based FPLs is a valuable proxy for actual FPLs in China.

Specific Comment 2. Lines 13-14. More explanations are needed on how Chinese flood risk may have been overestimated.

Accepted: Thanks for the suggestion. The overestimation of Chinese flood risk in previous studies resulted from an underestimation of Chinese flood protection. We revised the sentence accordingly. Please check from *lines 12–14 on page 1* or as follows:

The FPLs are significantly higher than previously estimated in the FLOPROS global dataset, suggesting that Chinese flood risk was probably overestimated.

Further, we compared the FPL dataset against the FLOPROS using the Paired Sample T Test and found that the protection levels are significantly higher in the former than in the latter ($p < 0.01$). Please check from *Supplementary Table S4*.

Specific Comment 3. Line 62, references are needed to say the FPL data are not well accessible.

Accepted: Thanks for the suggestion. References have been added (*line 66 on page 3*) and the sentence now reads as:

FPL data are typically difficult to access at a large scale in China (Jiang et al. 2020).

References:

Jiang, Y., Zhi, Y., Zhao, H., Liang, L., Cao, y., and Gu, J.: *Research status and prospects on water conservancy big data*, *Journal of Hydroelectric Engineering*, 39, 1-32, 2020.

Specific Comment 4. Lines 93, the data source of the GDP data should be specified.

Accepted: Thanks for the suggestion. The data source was the Statistical Yearbook of Chinese Cities 2016, which has been added (lines 100–101 on page 5).

References:

Division of Urban Social and Economic Survey of National Bureau of Statistics: Statistical Yearbook of Chinese Cities, China Statistical Press, Beijing, 2016.

Specific Comment 5. Table 2, the caption is unclear. Are the vulnerable exposed population in the brackets different from the followed vulnerable population?

Accepted: Thanks for the suggestion. The caption of Table 2 has been clarified. Please check from lines 519–521 on page 22, or as below.

Table 2. Exposed population (total, vulnerable, children, and elders) for each flood protection level (FPL), in absolute amounts and as percentage of the whole exposed population. The rightmost column reports the ratio of vulnerable to the total exposed population.

FPL (years)	Total exposure in millions (%)	Vulnerable exposure in millions (%)	Exposed children in millions (%)	Exposed elders in millions (%)	Vulnerable-to-total exposed population ratio
Low	188.4 (44.9)	38.3 (52.3)	19.4 (52.9)	18.8 (51.6)	20.3%
10–20	2.0 (0.5)	0.4 (0.6)	0.2 (0.6)	0.2 (0.6)	21.0%
20–30	96.5 (23.0)	19.9 (27.1)	10.1 (27.5)	9.8 (26.8)	20.6%
30–50	89.9 (21.4)	18.0 (24.6)	9.2 (24.9)	8.9 (24.3)	20.0%
High	231.1 (55.1)	35.0 (47.7)	17.3 (47.1)	17.7 (48.4)	15.1%
50–100	50.8 (12.1)	9.0 (12.2)	4.5 (12.1)	4.5 (12.3)	17.6%
100–200	82.5 (19.7)	13.6 (18.6)	6.9 (18.8)	6.7 (18.3)	16.5%
≥200	97.8 (23.3)	12.4 (17.0)	5.9 (16.2)	6.5 (17.8)	12.7%
Sum	419.5 (100)	73.3 (100)	36.8 (100)	36.5 (100)	17.5%

Specific Comment 6. Figure 2, the axis of flood protection levels should increase from the left to the right.

Accepted: Thanks for the suggestion. Figure 2 has been clarified. Please check from lines 526–527 on page 24, or as below.

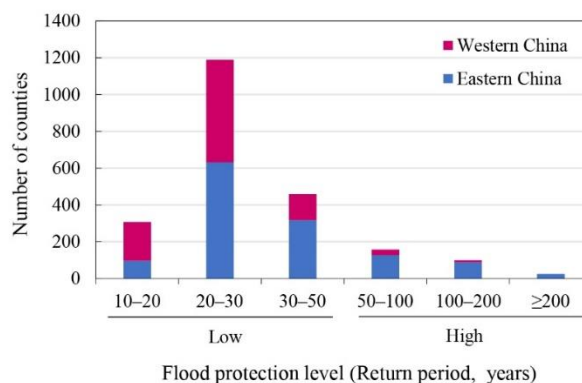


Figure 2 The number of counties with different flood protection levels. (The map of western and eastern China is shown in Figure 3)

Specific Comment 7. Figure 3, the boundary lines are difficult to identify, particularly for the provincial level.

Accepted: Thanks for the suggestion. Figure 3 has been clarified accordingly. Please check from lines 528–531 on page 25, or as below.

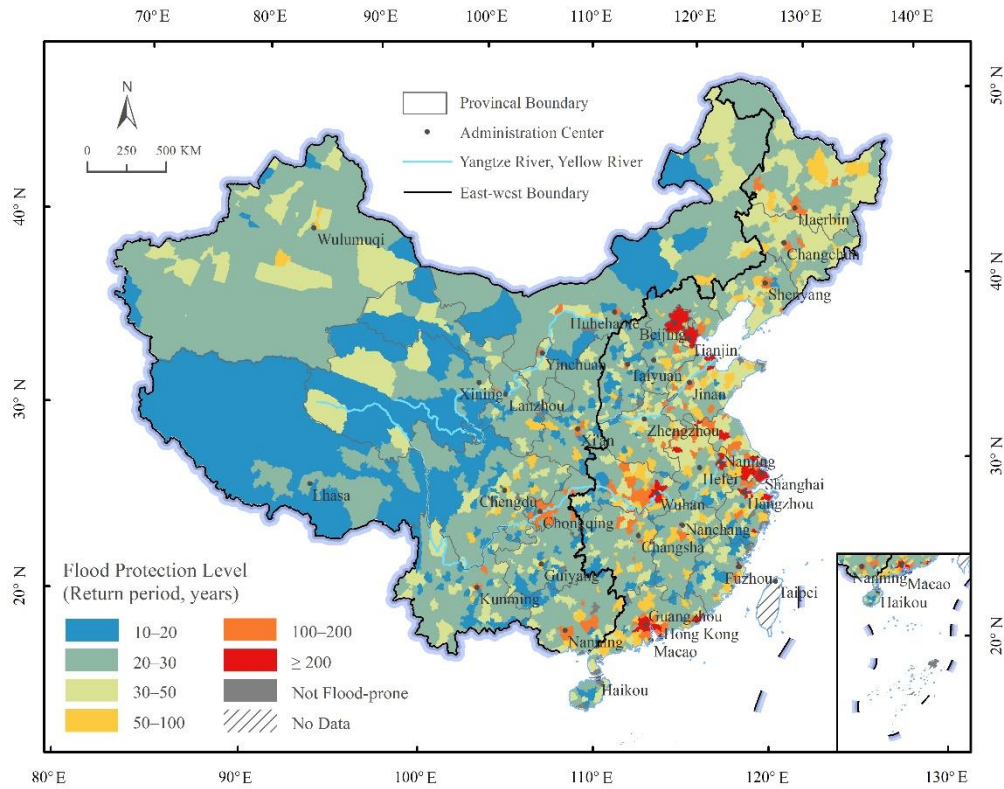


Figure 3 Flood protection level (FPL) for Chinese counties. The FPL is limited to the scope of floodplains but plotted to cover the entire counties. The data should only be viewed as a proxy of the actual FPLs, not equating to the actual FPLs. The Shapefile format data are available as a supplement.