

Interactive comment on “Weight analysis of dam break risk consequences influencing factors” by Zongkun Li et al.

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Thank you for your comments concerning our manuscript. Those comments are all valuable and helpful for improving our manuscript and future research. The main responses to those comments are as following: For question 1 and 2: Flood intensity reflects the approximate average damage caused by flood disasters, which can be jointly determined by the flood velocity and depth. The experience calculation formula often used is $SF = Q_{Top}/W_{Max}$, thereinto, Q_{Top} is the peak discharge of dam break, and W_{Max} is the maximum width of the water surface formed by the flood. Water environment and soil environment respectively refer to the quality of water and soil after being washed by dam-break flood. Their measurements can be based on the existing environment's vulnerability or sensitivity to flooding. For example, according

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to environmental functions and protection goals of surface waters, water environment can be divided into five categories in China in terms of functions, from source water to centralized domestic water to agricultural water. Soil quality can be divided into five categories, from desert(not suitable for vegetation growth) to woodland to national nature reserve. The index of social comprehensive disaster bearing capacity includes the performance of downstream disaster response, disaster rescue and relief capacity, and post-disaster reconstruction capacity. Its calculation and evaluation require experts to comprehensively evaluate the indicators of different regions.

3. Hazards, exposure and vulnerability are only for the purpose of more orderly and logical elaboration of indicators, which will not affect the rating of the indicators by experts. Because the experts do not need to make a pair-wise comparison or consistency test on the indicators, they only need to judge and grade according to the importance of the indicators for the overall risk consequences. Taking this manuscript as an example, 20 indicators exist in parallel, and whichever category they belong to will have no any impact on the rating of experts.

4. The verification of results can be verified from two aspects: one is the review based on expert experience; the other is the comparison with other methods. Taking this manuscript as an example, compared with the traditional method, the sorting is basically consistent, which further verifies the validity of the model. And the index weight is also roughly the same as Huang's article.

5. As for Huang's article mentioned before, its main evaluation indicators are consistent with this result. The differences are that Huang's paper mainly studies the loss of life, while this manuscript studies the comprehensive consequences for the downstream; consequently the indicators are more abundant. He did not compare the selected 11 indexes in the same dimension, but divides them to four different categories. If only in accordance with the sorting in a directory, sorting result is basically consistent, such as flood intensity > storage capacity, distance from the dam > dam breaking time, risk population > hazards understanding, and alert time > the downstream slope. Further-

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more, the indicators in this manuscript can be compared among different categories, not only within the specific category.

6. The understanding of weight can help stakeholders to take more targeted measures to control risk factors, thereby reducing the overall risk. The index weight is an important basis for stakeholders to analyze the risk of their existing dam, because a considerable number of multi-index risk assessment models are functions or models related to the weight. In addition, the weight of indicators on the impact of risk consequences can also provide the stakeholders with the basis of fund allocation for reinforcement of risk prevention, so as to judge how to put funds and resources into the aspect with greater weight for risk management. In a word, the weight research can improve the effect of risk control and risk management.

Special thanks to you for your precious comments.

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