This is an interesting and valuable paper on debris flow disaster mitigation in mountainous regions. It contributes meaningfully to enhancing disaster prevention and mitigation capabilities in these areas. The study offers important insights into advancing post-fire debris flow assessments, refining vulnerability models, and guiding emergency evacuation strategies. I sincerely appreciate the authors for sharing such inspiring and impactful work. Overall, the work is quite detailed, but it needs to improve the conciseness and logic of its expression, the following is several comments and suggestions that may help improve the manuscript.

Abstract

1. Lines 21-22, the background and research questions are too disconnected, lacking a summary of the current state of research within a broader context, which would help highlight the existing research gaps.

2. Authors emphasize using the quantitative approach, but the results did not show any number or quantitative result. Please give the quantitative description.

3. In the abstract, authors should highlight the significance of this research.

Introduction

1. Lines 42-66, Shorten the introduction to highlight the current status of the research in this paper and the problems that need to be solved. Directly point out why the debris flow disasters after wildfires are worthy of being focused on and then the vulnerability is significant…

2. Line 57: Suggest changing "continuous curve" to "monotonically increasing curve".

3. Line 75, means "previous study"?

4. Lines 77-98, please use the logic sentences to connect your reviewing work, don't list

the researchers one-by-one. And you should finally conclude why you choose FLO-2D to simulate.

5.　Line 88: It is suggested to clarify that the "relative intensity" here refers to "relative burial height". This can be consistent with the article.

6.　Lines 137-144: This paragraph in the introduction should not be treated as a separate paragraph and should be added to the end of the previous paragraph as a follow-up explanation. It is recommended to adjust it.

7.　Line 138: Suggest changing "thereby burning" to ", burning".

Study area

1. Authors should pay attention to the paper framework: introduction, methods and materials, results, discussion, conclusion. So, study area should be in the section of Methods and materials. And I suggest combine study area and field investigation section.

2. Line 191, please provide the right information of China map, change it.

3. Line 269, as for the 3.2.3 Debris flow peak discharge calculation, please give the main formula and list the derivation process to the Supplementary file.

4. Line 213 (Fig 3): Capitalize "Flo-2D" consistently as "FLO-2D" in text within the figure.

5.　Lines 240-242: I suggest changing the expression of slope here. Generally, slope is described as steep or gentle. Suggest replacing "high" and "lower" with "steeper" and "gentler".

6.　Line 326: Please clearly define n as Manning's coefficient and use the symbol "n" to

express it uniformly in Eq. 7.

7.   Line 326: Similarly, please clearly define K in Eq. 7.

8.   Line 399: Suggest changing 'power law' to 'power-law'.

9.   Line 405: Please define "V" explicitly in Eq. 15 is " vulnerability value (0-1)".

Results

1. Line 426: Please add the annotation "in G1 gully" to the title of Figure 7.

2.   Line 463: What's the meaning of $P = 2$?

3.   Lines 484-642: I greatly appreciate the author's extensive and in-depth exploration in the discussion section. They have done a lot of meaningful and commendable work on different indicators of debris flow intensity and vulnerability functions, as well as comparisons with previous research. This can provide important reference value for future researchers.

Discussion

1. In the section 5.1, authors should shorten the pages, just focus on the simulation result, don't show the calculation process, and don't list 3 subtitles.

2. Change the order of 5.1.4 and 5.2; limitation and future work should be a separate part.

3. Lines 490-523 & Fig 13-14: In-depth comparative analysis of intensity indicators (sensitivity vs. precision) is highly valuable and a key contribution.

4.   Table 5, The expression in the second column is inaccurate. Please modify it. Adjust the format of the content in the table.

5.   Lines 587-589: I suggest simplifying the expression of this paragraph and changing it

to "Table 6 provides the existing vulnerability function models, including Logical, Weibull, Exponential, LNCDF and Avrami functions".

6. Line 643: The authors' honest discussion of limitations enhances this excellent paper. I commend their approach to complex challenges and anticipate future work.

7. Lines 689: These suggestions on emergency response and evacuation strategies for disasters are valuable for local residents.

8. Fig.17, Modify the display legend of the elevation.

Conclusion and references

1. Line 772: Add DOI number to references.

2. Check the "Figure" or "Fig" used in the paper, the format should be uniform. Unify the format of the tables in the full paper.

3. Further refine the conclusion section.

4. Line 745, revise the author's names.

5. Check the references' style, just like "-" and " – ", the space in the middle of the name abbreviation.