

**Dear Editor and Referees,**

We appreciate the editor and reviewers' positive and constructive comments on our manuscript entitled "*Assessment of the vulnerability of buildings destroyed during postfire debris flow events in Kule village, Yajiang County, China*" (Manuscript ID: egusphere-2025-772). Thank you for the opportunity to revise our manuscript with the recommendation for Major Revision.

Thank you for your recognition of our work and your valuable suggestions for its improvement. We have carefully addressed all comments and revised the manuscript accordingly. Should further suggestions arise, we remain fully prepared to incorporate them. Our primary task is to carefully revise to meet the standards of the journal, and we hope this research merits your consideration for publication. Our point-by-point responses and corresponding revisions are shown in the **Appendix**. Once again, we extend our deepest gratitude for your insightful review and endorsement.

We would like to express our great appreciation to you for comments and recognition on our paper.

Looking forward to hearing from you. Thank you and best regards.

Yours sincerely,

Jinshui Wang, Jiangang Chen, Lu Zeng, Fei Yang, Xiao Li, Wanyu Zhao, Huayong Chen

## Appendix:

Editor	Comments	Response
1	<p>Thank you for the submission of your very interesting manuscript, “Assessment of the vulnerability of buildings destroyed during postfire debris flow events in Kule village, Yajiang County, China”.</p> <p>As you know, two reviewers have now provided detailed reviews, which you have replied to in thoughtful detail. While one reviewer suggested 'minor', another suggested for major revision. I have a feeling some of the suggested revisions aren't so minor — they may take a bit of time! Therefore, I would like to invite you to submit a revised version of your manuscript.</p> <p>Would you please also provide an ‘author’s reply’ to the reviewers (feel free to use the same words that you used in what you have already uploaded). Please can you also include a track changes document between the old manuscript and the new one (you can include this as part of your ‘author’s reply’).</p> <p>I look forward to seeing the next version of your manuscript, which I will then send out for further review to either the previous reviewers (if they agree) or new reviewers.</p> <p>Regards</p>	<p>Dear Editor,</p> <p>Thank you very much for your thoughtful handling of our manuscript and for your encouraging words. We are truly grateful that you found our work "very interesting" and we sincerely appreciate the opportunity to revise.</p> <p>We have carefully considered the detailed comments from both reviewers and have undertaken a thorough revision to address all points raised. In the revised manuscript, all changes are clearly marked using track changes. We also have prepared a detailed point-by-point response to the reviewers' comments.</p> <p>We are deeply grateful for the time and expertise that you and the reviewers have dedicated to improving our work. Your thoughtful guidance has helped us enhance both the clarity and quality of the manuscript. Should any further adjustments be needed, we remain fully prepared to address them. Our primary goal is to carefully revise the manuscript to meet the standards of the journal, and we hope this research merits your consideration for publication.</p> <p>Thank you once again for your support and professional guidance throughout this process.</p>

Referee #1	Comments	Response
1	<p>This is an interesting and valuable paper on post-fire debris flow disaster in mountainous regions. After I carefully read the paper, I think this paper is quite detailed; however, it still needs to improve the conciseness and logic of its expression. Some comments and suggestions are listed and hope it's helpful for the authors to improve the manuscript.</p>	<p>Dear Referee #1,</p> <p>We are deeply grateful for your exceptionally generous and insightful feedback on our manuscript. Your kind words and positive assessment have been a tremendous encouragement to our entire team.</p> <p><b>Firstly</b>, we are truly honored that you considered our study "interesting and valuable" in advancing debris flow disaster mitigation in mountainous regions. Thank you for recognizing the impact and thoroughness of our work—it is especially rewarding to know that our research resonates with experts like you, whose perspectives are highly valued in the field.</p> <p><b>Secondly</b>, we sincerely appreciate your insightful comments and constructive suggestions for improving the conciseness and logic of expression. Following your guidance, we have carefully revised and supplemented the relevant sections. Our specific point-by-point responses and modifications are detailed below.</p> <p><b>Finally</b>, Thank you once again for your valuable suggestions and recognition. We are deeply grateful for your encouraging feedback and actionable advice, which have significantly strengthened our study. Should any aspects still require further refinement, we warmly welcome your additional guidance. Please accept our profound gratitude for your mentorship throughout this revision process.</p>
2	<p><b>1.Abstract:</b> Two points (1) Further refinement the abstract is needed, and the verbose</p>	<p>Thank you for your valuable suggestion. Following your professional guidance, we have thoroughly revised the abstract to improve clarity and</p>

	<p>sentences need to be rewritten.</p> <p>(2) Reduce procedural descriptions and appropriately increase quantitative results.</p>	<p>eliminate verbosity, restructuring long sentences for directness. Thank you again for your valuable comments and assistance.</p> <p>Thank you very much for your valuable comments. Based on your valuable suggestion, we also recognize that that the original version overemphasized the process; consequently, we have significantly increased the emphasis on our quantitative results by incorporating key data to better highlight our main findings and further highlight this expression more clearly. Thank you again for your suggestions on enhancing the expression.</p>
<p>3</p>	<p><b>2.Introduction</b> Three points</p> <p>(1) Reduce the total word count of the introduction.</p> <p>(2) Line 137-144, move to “Section 2 Study area”.</p> <p>(3) Add a clear statement of the aims.</p>	<p>(1) Thank you very much for your valuable comments on the Introduction section. Your suggestions have helped us make it more concise and logically coherent. We have streamlined the entire section by consolidating sentences with similar meanings to achieve more compact expression and removing redundant background information. Through these measures, the total word count of the introduction has been reduced, resulting in a sharper focus. Thank you again for your suggestions on enhancing the expression of our paragraphs.</p> <p>(2) Thank you for your careful guidance and suggestions. We greatly appreciate this suggestion regarding placement. You are absolutely correct that the description of the study area's specific characteristics is out of place in the Introduction and more naturally belongs in the dedicated "Study Area" section. We have moved the content from lines 137-144 in its entirety to Section 2 (Study Area). We have also polished the transition</p>

		<p>to ensure it integrates smoothly with the surrounding text in its new location. Thank you again for your valuable advice and guidance.</p> <p>(3) We would like to express our gratitude for your valuable suggestions. Under your professional guidance, we have added and modified a clearer and more concise statement of the research aims at the end of the introduction section, which explicitly outlines the primary objectives of our study. Thank you again for this important feedback and suggestions.</p>
4	<p><b>3.Study area:</b> One point</p> <p>(1) Merge the contents of the following two sections: Section 2 and Section 3.1 and 3.2.</p>	<p>Thank you for your valuable suggestion. Following your recommendation, we have consolidated the content from the original Section 2 (Study Area) and Sections 3.1 &amp; 3.2 into a single, cohesive section titled "2.1 Field investigation and data acquisition." This revised section now integrates the geographical context, wildfire and debris flow events, rainfall characteristics, field survey methods, and debris flow parameter calculations under three subsections: "2.1.1 Study area," "2.1.2 Field data collection," and "2.1.3 Calculation of postfire debris flow parameters." This reorganization provides readers with a more streamlined and coherent introduction to the study area and the data acquisition process. Thank you again for your constructive comments on improving the manuscript's structure.</p>
5	<p><b>4. Methods:</b> One point</p> <p>(1) Retain the introduction and verification of numerical simulation methods (Section 3.3) and Development of empirical vulnerability models for buildings (Section 3.4).</p>	<p>Thank you for your valuable suggestion and guidance. As instructed, we have retained the core methodological components in the revised "2. Methods" section. The numerical simulation methods (formerly Section 3.3), including model governing equations, parameter settings, and calibration validation, are now presented in Section 2.2 ("FLO-2D</p>

		<p>numerical simulation of disaster scenarios") with subsections 2.2.1 and 2.2.2. The development of empirical vulnerability models for buildings (formerly Section 3.4), covering damage classification, intensity indicators, and vulnerability curve functions, is now presented in Section 2.3 ("Development of empirical vulnerability models for buildings") with subsections 2.3.1, 2.3.2, and 2.3.3. This reorganization ensures that the Methods section focuses on the most critical and innovative aspects of our work while maintaining a clear and logical flow. Thank you again for your helpful comments.</p>
6	<p><b>5.Results:</b> Two points</p> <p>(1) Merge Figure 7 and Figure 8, Revise the expressions in the text.</p> <p>(2) Revise the title of Section 4.2 and 4.3, to highlight the characteristics of this part.</p>	<p>(1) Thank you for this valuable suggestion. According to your suggestion, we have merged Figure 7 and Figure 8, which will facilitate a more direct and effective comparison of the results. Furthermore, we have thoroughly revised the corresponding text in the Results section. All previous references to the separate Figure 7 and Figure 8 have been updated to direct the reader to the new and combined figure. Thank you again for your careful guidance.</p> <p>(2) Thank you for your valuable suggestion. We have revised the titles to more accurately and prominently reflect the core findings and applications presented: The original title 4.2 and 4.3 has been revised to "4.2 Development of an intensity-vulnerability model for debris flow" and "4.3 Model application: intensity Prediction and spatial vulnerability assessment for the G2 gully". Thank you again for helping us improve our expression.</p>
7	<p><b>6. Discussion:</b> Further refine the content, now it's about 15 pages.</p>	<p>Thank you for your valuable suggestion. We have critically reviewed the</p>

		entire section to eliminate redundancy and consolidate related arguments. The focus has been sharpened to provide a more concise and impactful interpretation of the key results, their direct implications and compared with existing literature. Thank you again for your suggestion.
8	<b>7. Conclusion:</b> Further refine the conclusions.	We greatly appreciate your valuable suggestions. According to your suggestion, we have thoroughly revised the Conclusion section to ensure it is precise and impactful. Thank you again for your guidance and assistance.
9	<b>8. References:</b> Refer to the submission instructions, check the format and add DOI.	Thank you for this important reminder. The DOI for all references has been added. Thank you again for your careful suggestion.
10	<b>9.</b> Check the Figs and the title of the Fig.	Thank you for your careful suggestion. We will check and unify it. Thank you again for your careful inspection.
11	<b>10.</b> The final version of the MS should be reviewed by a native English speaker.	Thank you for your valuable suggestion. we have engaged the professional editing services to thoroughly review and polish the entire manuscript language. The final version has been meticulously checked for grammar, spelling, syntax, and overall fluency to ensure it meets the high standards required for publication. Thank you again for your suggestion.  Finally, we are profoundly grateful for your thorough review and expert guidance. Thank you again for your high recognition of our manuscript, which has given us great confidence to strengthen this study. we greatly appreciate your suggestions for helping us improve our manuscript, and we hope these improvements meet the journal's standards for publication. Should further clarifications be needed, we are fully committed to addressing them promptly.

Referee #2	Comments	Response
1	<p>General comments:</p> <p>The manuscript presents a case study of building vulnerability to postfire debris flows in Kule village, using field investigation, FLO-2D simulations and empirical vulnerability functions. The postfire debris flow appears quite different physical characteristics and dynamic behavior comparing with normal debris flow, which will cause it to have different destructive characteristics. This manuscript has noticed the variations in the destructive characteristics, and has studied the vulnerability of buildings under the influence of postfire debris flows after a fire. It is novel and has practical value for disaster risk reduction.</p> <p>The current description shows that the authors conducted a field investigation in the burned area, derived the necessary physical parameters and then ran the model. In the analysis, the authors first select debris-flow intensity measures and then fit intensity–damage relationships with different functional forms, concluding that the LNCDF model performs best among the tested options. Readers would like to know whether one can also run this model after conducting a field investigation in non-fire areas and getting the corresponding parameters? I hope manuscript can describe it point clearly. In addition, there are several issues in the description of the study area, figure labelling and English usage.</p>	<p>Dear Referee #2,</p> <p>With utmost gratitude, we wish to express our profound appreciation for your invaluable suggestions and meticulous guidance.</p> <p><b>Firstly</b>, thank you very much for your recognition and encouragement of our manuscript. We appreciate your recognition of its novelty and practical value for disaster risk reduction. Thank you for giving us the opportunity and recommend minor revision, which has given us great confidence to work hard to address the existing problems.</p> <p><b>Secondly</b>, we are deeply grateful for your professional guidance and invaluable suggestions, which have greatly assisted us to improve the clarity and presentation of our work. Thank you for raising this valuable question regarding the model's applicability to non-fire areas, which is indeed important for readers. You are correct to highlight this point. The core methodology presented in this study—integrating post-event field investigation, physics-based numerical simulation (FLO-2D), and statistical vulnerability modeling (LNCDF)—constitutes a transferable framework. Specifically, the LNCDF vulnerability function model itself is applicable to both fire and non-fire contexts, as demonstrated in previous studies on conventional debris flows (Kean et al., 2019; Luo et al., 2023). The primary distinction when applying this framework lies in the context-specific inputs and corresponding parameters. For non-fire areas, key differences would arise in the sediment source conditions and hydrological</p>

I therefore recommend minor revision. The followings are detailed comments for reference.

response due to intact vegetation, and consequently, the simulated debris flow intensities. These differences would lead to different fitted parameter values within the LNCDF model, reflecting the altered hazard characteristics. However, this does not affect the applicability of the statistical model form itself. The overall analytical framework remains valid and can be adapted by using appropriate, site-specific inputs. We will clarify this important point in the revised manuscript (in the Discussion section) to explicitly state the adaptability of the methodological framework and the context-specific nature. Regarding the other issues you mentioned concerning the description of the study area, figure labelling, and English usage, we sincerely apologize for these oversights. We have carefully reviewed your specific comments and technical corrections, and have addressed each one thoroughly in the revised manuscript. Following your careful guidance, all necessary corrections and clarifications have been made to improve the accuracy, clarity, and overall quality of the presentation. Your constructive feedback has been invaluable in helping us refine and strengthen the paper.

**Finally**, thank you again for your valuable suggestion and your recognition. Your suggestions are very helpful and make our manuscript more organized and complete, and improved the scientific quality. Thank you for investing your time and effort in providing feedback. We strive to provide detailed responses and careful revisions, and sincerely appreciate your valuable suggestions and professional guidance. If we had any omissions in the modifications, we hope to get your corrections. Please

		<p>accept our deepest gratitude for your mentorship throughout this revision process.</p> <p>References:</p> <p>Luo, H. Y., Zhang, L. M., Zhang, L. L., He, J., &amp; Yin, K. S. (2023). Vulnerability of buildings to landslides: The state of the art and future needs. <i>Earth-Science Reviews</i>, 238, 104329.</p> <p>Kean, J. W., Staley, D. M., Lancaster, J. T., Rengers, F. K., Swanson, B. J., Coe, J. A., ... Lindsay, D. N. (2019). Inundation, flow dynamics, and damage in the 9 January 2018 Montecito debris-flow event, California, USA: Opportunities and challenges for post-wildfire risk assessment. <i>Geosphere</i>, 15(4), 1140–1163.</p>
2	<p>Specific comments:</p> <p>1. The FLO-2D parameters calibrated for the G1 event are directly transferred to the G2 gully, while only the DEM and design peak discharges are changed. However, the G1 and G2 gullies may differ in channel morphology, roughness and postfire sediment conditions. This assumption of parameter homogeneity between the two gullies is not explicitly discussed, and its potential impact on the predicted intensities and damage scenarios is unclear. I recommend that the authors, where possible, compare the simulated results for G2 with other available post-event, in order to support the transferability of the calibrated parameter set and enhance confidence in the model results.</p>	<p>Thank you for your valuable and helpful suggestions. We fully understand your concern that the transfer of model parameters between different gullies requires clear explanation and discussion to reduce the uncertainty in the prediction results. In accordance with your recommendations, we have made the following additions and revisions to the manuscript to clarify the methodology, discuss limitations, and strengthen the argument. First, we have provided a full explanation of the practical constraints and research objectives of this study. The G2 catchment is a potentially hazardous gully where no post-fire debris flow has yet occurred, and therefore no post-event observational data from G2 itself is available for direct model validation. The primary purpose of including G2 in our simulations is precisely to enable a comparative risk assessment with the adjacent G1 catchment, where a disaster has already occurred. This</p>

approach aims to reveal the compound, bilateral threat that both gullies pose to the downstream Kule Village, thereby providing a more comprehensive integrated vulnerability assessment for this community.

In response to your concerns regarding the feasibility of parameter transfer, we have added a supplementary explanation in the Methods section. This explicitly states the rationale and fundamental assumptions behind applying the parameter set calibrated for G1 to G2, which are based on the following considerations: (1) G1 and G2 are spatially adjacent and exhibit similarities in terms of geological setting, soil type, vegetation, catchment hydrological characteristics, fire history, and field-observed surface material composition; (2) Using the same parameter set, validated against the G1 event, is essential to ensure that the simulation results for both catchments are on a consistent basis, which is crucial for a fair evaluation of their relative hazard to the same community.

Furthermore, following your guidance, we have substantially expanded the Discussion section. We have added an explicit discussion emphasizing the uncertainties associated with the assumption of parameter similarity and its potential impact on predicted intensities and damage scenarios. To address your suggestion to seek "other available post-event data" for comparison in order to support parameter transferability, we systematically collected and cited published case studies of debris flows occurring in similar geological and post-fire environments (e.g., Gong et al., 2025; He et al., 2024). We conducted a comparative analysis, matching the order of magnitude and range of key macro-indicators from our G2

		<p>simulations with the actual observations recorded in field surveys of other similar gullies within the region. This analysis verifies that our simulation results are consistent, both in magnitude and physics, with observational data from analogous hazard events. These lines of evidence strengthen confidence in the applicability of our parameter set within the study area and in the credibility of the predicted scenarios for G2. Thank you again for your valuable advice and professional guidance, which helped us improve our manuscript.</p> <p>References:</p> <p>Gong, X., Zhou, Y., Hu, X., He, K., &amp; Wang, J. (2025). Spatiotemporal distribution characteristics of post-fire debris flows during the first rainy season following Yajiang Fire, Sichuan, China: X. Gong et al. Landslides, 1-16.</p> <p>He, K., Hu, X., Wu, Z., Zhong, Y., Zhou, Y., Gong, X., &amp; Luo, G. (2024). Preliminary analysis of the wildfire on March 15, 2024, and the following post-fire debris flows in Yajiang County, Sichuan, China.</p>
<p>3</p>	<p>2. The authors compare different functional forms and conclude that LNCDF provides the best fit between debris-flow intensity and building vulnerability. However, it remains unclear why LNCDF performs best, and what aspects of postfire debris flows make the intensity-damage relationship different from that of “normal” debris flows. I recommend that the authors expand the discussion to analyze the physical or empirical reasons behind the superior performance of LNCDF and to highlight the</p>	<p>Thank you for your valuable comments and professional guidance. Under your suggestions, we have significantly expanded the “Discussion” section to provide a more in-depth analysis as recommended.</p> <p>Firstly, we have added a systematic discussion on why the LNCDF is the most appropriate form for vulnerability analysis: 1) Mathematical and Physical Soundness: the LNCDF function curve satisfies the fundamental physical constraints from the origin (0,0) to the saturation point (high intensity, 1), aligning with the physical reality that “no disaster leads to no</p>

characteristic features of postfire debris-flow propagation and hazard formation, as well as the specific damage mechanisms of buildings subjected to postfire debris flows.

loss” and that damage tends to saturate under high intensity. Other functional forms (e.g., exponential) cannot mathematically guarantee passage through the origin, representing a theoretical shortcoming. 2) Statistical Robustness and Generalization: The parameter fitting process for the LNCDF is based on the overall distribution of the data rather than point-to-point fitting. This makes the model less sensitive to single, potentially anomalous data points, preventing it from being unduly dominated by outliers and thereby enhancing its robustness. Avoiding overfitting like other functional models, which leads to increased errors and decreased prediction accuracy. Previous studies on the vulnerability analysis of post-fire debris flows and normal debris flows (Kean et al., 2019; Luo et al. (2023) have shown that LNCDF can effectively reduce prediction uncertainty in describing the intensity-damage relationship, further supporting its application.

Secondly, as recommended, we have added a discussion on post-fire debris flows exhibit unique propagation and impact mechanisms compared to "normal" debris flows, primarily due to wildfire-induced watershed changes. These features increase the scatter and uncertainty in the observed intensity-damage relationship, making the LNCDF's statistical properties particularly advantageous: 1) Enhanced Erosion and Flow Composition: Fire increases the proportion of loose, fine particles in surface soil (Ouyang et al., 2023). These are easily entrained, leading to higher solid concentrations, more viscous flows, and a greater tendency for deposition and building inundation. 2) Altered Runoff and Impact

Dynamics: Fire damages root systems and reduces slope infiltration capacity, resulting in more pronounced sheet erosion and numerous small runoffs after rainfall. This subjects buildings to multi-directional and uneven impacts, increasing variability in damage even for similar overall flow intensities. Besides, burned basins exhibit lowered rainfall thresholds for debris flow initiation, leading to higher frequency events over extended periods and multiple building damages (Fraser et al., 2022; Ouyang et al., 2023). 3) High temperatures from fire can weaken building envelopes, lowering their initial threshold for withstanding dynamic impact or static deposition loads. The aforementioned mechanisms collectively introduce greater variability and uncertainty into the intensity-damage dataset for post-fire events. The LNCDF model, with its foundation in statistical distribution theory and inherent capacity to accommodate data dispersion, is therefore especially well-suited to robustly characterize the vulnerability relationship arising from these complex and variable post-fire physical processes (Kean et al., 2019). We would like to express our gratitude once again for your valuable suggestions and professional guidance.

References:

Luo, H. Y., Zhang, L. M., Zhang, L. L., He, J., & Yin, K. S. (2023). Vulnerability of buildings to landslides: The state of the art and future needs. *Earth-Science Reviews*, 238, 104329.

Kean, J. W., Staley, D. M., Lancaster, J. T., Rengers, F. K., Swanson, B. J., Coe, J. A., ... Lindsay, D. N. (2019). Inundation, flow dynamics, and damage in the 9 January 2018 Montecito debris-flow event,

		<p>California, USA: Opportunities and challenges for post-wildfire risk assessment. <i>Geosphere</i>, 15(4), 1140–1163.</p> <p>Ouyang, C., Xiang, W., An, H., Wang, F., Yang, W., &amp; Fan, J. (2023). Mechanistic Analysis and Numerical Simulation of the 2021 Post-Fire Debris Flow in Xiangjiao Catchment, China. <i>Journal of Geophysical Research: Earth Surface</i>, 128(1).</p> <p>Fraser, A. M., Chester, M. V., &amp; Underwood, B. S. (2022). Wildfire risk, post-fire debris flows, and transportation infrastructure vulnerability. <i>Sustainable and Resilient Infrastructure</i>, 7(3), 188-200.</p>
4	<p>Technical corrections:</p> <p>1. In Sect. 3.2 the authors only present the calculation of peak discharges, whereas Fig. 6 shows full discharge hydrographs, with identical peak duration for all return periods. Please clarify how these hydrographs were derived and whether assuming the same peak duration for different return periods is reasonable.</p>	<p>Thank you for your valuable suggestions and comments. The full discharge hydrographs shown in Fig. 6 were developed using a pentagonal generalized hydrograph method. This approach is commonly employed in debris flow studies where detailed monitoring records are unavailable and has been widely adopted in previous research (Fang et al., 2019; Ding et al., 2023; Zhang et al., 2023). The method constructs the hydrograph shape based on the calculated peak discharge and an estimated total duration. Specifically, the hydrograph is defined such that 1/4 of the peak flow occurs at 1/3 of the total surge duration, and 1/3 of the peak flow occurs at 2/3 of the duration, resulting in a characteristic five-segment shape. We have supplemented the method of flow process line: “The flow process line of debris flow discharge can be obtained by using the generalized pentagon method, which has been widely adopted in previous studies (Zhang et al., 2023; Ding et al., 2023).” Regarding the identical peak duration across all return periods, this is an accepted simplification</p>

		<p>adopted and widely applied in previous studies (Zhang et al., 2023; Ding et al., 2023; Fang et al., 2019). We also recognize the limitations of this method and therefore plan to add a clarification in the discussion section stating that accurately determining debris flow hydrographs still requires actual field monitoring data. Thank you again for your advice and assistance.</p> <p>References:</p> <p>Zhang, W., Chen, J., Ma, J., Cao, C., Yin, H., Wang, J., &amp; Han, B. (2023). Evolution of sediment after a decade of the Wenchuan earthquake: a case study in a protected debris flow catchment in Wenchuan County, China. <i>Acta Geotechnica</i>, 18(7), 3905-3926.</p> <p>Ding, X. Y., Hu, W. J., Liu, F., &amp; Yang, X. (2023). Risk assessment of debris flow disaster in mountainous area of northern Yunnan province based on FLO-2D under the influence of extreme rainfall. <i>Frontiers in Environmental Science</i>, 11, 1252206.</p> <p>Fang, Q., Tang, C., Chen, Z., Wang, S., &amp; Yang, T. (2019). A calculation method for predicting the runout volume of dam-break and non-dam-break debris flows in the Wenchuan earthquake area. <i>Geomorphology</i>, 327, 201-214.</p>
5	<p>2. In the methods, the debris flow is described as wide-graded, and Fig. 4f shows boulders with diameters on the order of 0.5 m, whereas Fig. 4i indicates a maximum grain size of less than 10 cm. Please check whether there is an inconsistency between the field observations and the grain-size distribution and correct or</p>	<p>Thank you for this careful observation. You have correctly identified an important distinction between our field observations and the laboratory grain-size analysis, which we should have clarified. Fig. 4f shows large boulders are observed in the channel deposit. the particle-size distribution curve in Fig. 4i was obtained from samples processed using vibrating</p>

	explain if necessary.	sieves (measuring range: 0.25–20 mm) and a Malvern laser analyser (measuring range: 0.02–2000 $\mu\text{m}$ ). These instruments cannot measure particles at the scale of the observed boulders (e.g., $\sim 0.5$ m). Therefore, the curve accurately represents only the portion of the sampled material that falls within the instruments' measurement range and does not include the largest clasts documented in the field. We have revised the Methods section to explicitly state this point. The following clarifying sentence has been added: "Derived from sieving and laser analysis, the curve only includes particles up to 20 mm and excludes the larger boulders documented in the field (Fig. 4f)." Thank you again for your valuable suggestion, which has helped improve the clarity and precision of our methodology description.
6	3. L11 "University of Chinese Academy Sciences" should be "University of Chinese Academy of Sciences"	Thank you for pointing this out. The institution name has been corrected to "University of Chinese Academy of Sciences" in the manuscript.
7	4. L32-34 The term "statistical significance" is normally used together with p-values and hypothesis testing, not with relative error or prediction accuracy.	Thank you for your valuable suggestion. We agree that "statistical significance" was not the appropriate term in this context. Following your comment, we have revised this expression to more accurately describe the best performance of the LNCDF model in terms of relative error and prediction accuracy, without implying hypothesis testing. The revised text now reads: "The results revealed that the lognormal cumulative distribution function (LNCDF) model achieved the best performance in terms of relative error and prediction accuracy." Thank you again for your guidance.

8	<p>5. L61 When listing existing vulnerability models, it would be helpful to briefly summarize their performance or main limitations, rather than only enumerating them.</p>	<p>Thank you for your valuable comment. We have revised the paragraph at line 61 to concisely summarize the common methodological foundation from existing vulnerability analysis, moving from a listing to an integrated statement as suggested. Revised text: “Several statistical method-based studies have been conducted to develop physical vulnerability curves for debris flows on the basis of field data (Lee et al., 2024). They have established curves based on intensity-damage relationships (Fuchs et al., 2007; Totschnig et al., 2011) for specific regions and building types like brick–concrete (BC) and reinforced concrete (RC) structures (Kang and Kim, 2016).” Thank you again for your insightful suggestion, which has helped us synthesize the cited literature into a concise overview of common methodological approaches, thereby providing a clearer context for our study.</p>
9	<p>6. Both the introduction and the discussion contain long paragraphs that mainly list references. I suggest condensing these lists and focusing more on synthesizing the key messages and identifying gaps, instead of extensive citation catalogues.</p>	<p>Thank you for this important and constructive suggestion regarding our introduction and discussion contain long paragraphs that mainly list references. We agree that excessive listing of references can obscure the key messages and critical gaps in the literature. Following your professional guidance, we have carefully revised both sections with a focus on synthesis and critical analysis rather than citation cataloguing. Specifically: In the introduction, we have restructured the literature review, summarized their collective contributions, and more clearly articulated the research gaps that motivate our work. In the discussion, we have condensed comparative references and strengthened the narrative to directly interpret our results in light of existing knowledge, emphasizing</p>

		points of agreement, divergence, and the novel implications of our findings. Thank you again for your valuable advice, which has helped us improve the clarity.
10	7. Please reorganize the English expression regarding the article's primary objectives in the line 146-155. For example, use the present tense and “to do ...” for your objectives.	Thank you for your valuable suggestions. We have revised the description of the study objectives (lines 146–155) as recommended, now using the present tense and the “to do...” structure to state our aims clearly and concisely. The updated paragraph is provided below for your review: “In this study, the aim is to comprehensively assess the physical vulnerability of buildings damaged during postfire debris flows in Kule village, Yajiang County. The primary objectives are as follows: (1) To analyze the characteristics of postfire debris flows and establish a building damage database through field investigations. (2) To reconstruct debris flow events via FLO-2D numerical simulations in order to determine debris flow intensity. (3) To develop physical vulnerability curves for BC buildings for assessing the establishment and application of a vulnerability assessment model. (4) To compare the differences in performance among various vulnerability approaches, such as existing intensity indicators, curves, and function models. This work aims to provide insights for advancing postfire debris flow assessments, improving vulnerability models, and guiding emergency evacuation efforts in this region.” Thank you again for your valuable suggestions and professional guidance, which have improved our expression to be clearer.
11	8. L137 It should be “On 15 March, 2024”. Please standardize all date expressions throughout the manuscript.	Thank you for your careful review and valuable advice. According to your suggestion. We have now standardized the format of all dates throughout

		the manuscript to “Day Month Year”. Specifically, the expressions on Lines 137, 172 and 175 have been revised to “On 15 March, 2024” and “on 10 May”. This ensures consistency in date presentation across the entire text. Thank you again for your helpful comment.
12	9. L178 Please check whether it is appropriate to describe Yajiang County as having a “subtropical monsoon climate”.	<p>Thank you for this insightful comment regarding the climate description. Upon careful consideration and further literature review, it is necessary to provide a more appropriate description. Based on the regional climate expression by He et al. (2024), we have revised the description to specify a “plateau monsoon climate.” Consequently, we have revised line 178 to: “Yajiang County is located in a plateau monsoon climate zone (He et al., 2024).” We are grateful for your prompt, which led to this important correction and enhanced the manuscript’s accuracy.</p> <p>References:  He, K., Hu, X., Wu, Z., Zhong, Y., Zhou, Y., Gong, X., &amp; Luo, G. (2024). Preliminary analysis of the wildfire on March 15, 2024, and the following post-fire debris flows in Yajiang County, Sichuan, China. <i>Landslides</i>, 21(12), 3179-3189.</p>
13	10. L178-181 Please specify for which period the average rainfall of 166.1 mm is calculated. Moreover, the statement “the average rainfall reaches 166.1 mm, accounting for more than 70% of the total annual precipitation” is not consistent with the long-term annual precipitation of 600-1200 mm.	Thank you to for the insightful corrections. You are completely correct that the original statement regarding "166.1 mm accounts for more than 70% of annual precipitation" has a mathematical contradiction with the range of "annual precipitation 600-1200 mm", due to an inaccurate data reference and we apologize for this confusion. We have thoroughly revised the text based on reliable data from the latest literature (He et al., 2024) to resolve this contradiction and improve our description. The relevant

		<p>sentence now reads: "..., and the long-term annual precipitation ranges from 600 to 1200 mm, with precipitation mainly concentrated from June to September, which accounts for about 86% of the annual total, with a recent decadal average (2010–2020) of 705 mm (He et al., 2024).” We thank you again for your valuable suggestion, which has improved the accuracy of our manuscript.</p> <p>References:  He, K., Hu, X., Wu, Z., Zhong, Y., Zhou, Y., Gong, X., &amp; Luo, G. (2024). Preliminary analysis of the wildfire on March 15, 2024, and the following post-fire debris flows in Yajiang County, Sichuan, China. <i>Landslides</i>, 21(12), 3179-3189.</p>
14	<p>11. L474 There seems to be an error in Fig. 10d: the label for flow velocity and design frequency suggests <math>P = 2\%</math>, but from the context it may be <math>P = 1\%</math>. A similar issue appears in the title of Appendix B, where the panel (b) “Design frequency <math>P = 1\%</math>” should likely be “<math>P = 2\%</math>”. Please check all labels carefully.</p>	<p>Thank you for your careful review and helpful suggestions. We have corrected the writing error by thoroughly checking and revising the labels in Figure 10 and the Appendix B to ensure consistency. Specifically: (1) the label for Fig. 10d has been updated to indicate flow velocity at the design frequency <math>P = 2\%</math>; (2) the title of Appendix B has been changed to “(b) Design frequency <math>P = 2\%</math>”. We appreciate your feedback, which has significantly improved the precision of our details.</p>
15	<p>12. L588 “logical functions” should be “logistic functions”</p>	<p>Thank you for your careful suggestion. Following your valuable suggestion, we have corrected this expression and changed the term to "logistic functions".</p>
16	<p>13. L592 The definition and calculation of <math>R^2</math>, MRE and other performance indices should be described in the Methods section rather than in the Discussion. Please consider moving the</p>	<p>Thank you for your valuable suggestion. Following your advice, we have moved the definition and calculation of <math>R^2</math>, MRE and other performance indices to the Methods section. This adjustment significantly improves the</p>

	description to the methodological part for clarity.	clarity, and we thank you again for your insightful comment. <b>Finally</b> , we deeply appreciate your valuable suggestion, which has significantly strengthened our manuscript. Thank you for investing your time and effort in providing feedback. We strive to provide detailed responses and careful revisions, and sincerely appreciate your constructive feedback and guidance, and we hope these improvements meet the journal's standards for publication. Should further clarifications be needed, we are fully committed to addressing them promptly. Thank you again for your valuable suggestions and professional guidance.
<b>Community CC1</b>	<b>Comments</b>	<b>Response</b>
<b>1</b>	This manuscript is mainly focus on the buildings damaged by post-fire debris flows in mountain village. The authors have conducted detailed field investigations and reconstructions of disaster scenarios by numerical simulation, and development of physical vulnerability model for damaged buildings. The authors provide a comprehensive review of existing statistical models and indicators for vulnerability assessment, supplemented by extensive comparative analysis with previous research. Overall, this manuscript is interesting and it offers essential insights for assessing the impacts of post-fire debris flows on buildings and it's helpful for mitigation strategies. Therefore, in my opinion, this manuscript is suitable for the scope of the journal, however, some suggestions are given for improving the manuscript.	Thank you sincerely for your exceptionally generous and insightful review of our manuscript. We are deeply honored by your praise and positive comments, which have greatly encouraged our team. <b>Firstly</b> , thank you very much for your recognition and praise of our manuscript, and for considering our article interesting and suitable for the journal. We greatly appreciate your belief that our research is valuable and meaningful to offers essential insights for assessing the impacts of post-fire debris flows on buildings and it's helpful for mitigation strategies. <b>Secondly</b> , we sincerely appreciate your insightful comments and constructive suggestions for improving our manuscript. Thank you very much for your recognition and encouragement of our manuscript, which has given us great confidence to work hard to address the existing problems. Following your guidance, we have carefully revised and

		<p>supplemented, and the specific response and modifications are shown below.</p> <p><b>Finally</b>, thank you again for your valuable suggestion and your recognition. We are deeply grateful for your encouraging feedback and actionable suggestions, which have significantly enhanced our study. If we had any omissions in the modifications, we hope to get your corrections. Please accept our deepest gratitude for your mentorship throughout this revision process.</p>
2	<p>Some comments on the manuscript:</p> <ol style="list-style-type: none"> <li>1. Line 103: Suggest replacing "quantities" with " parameters".</li> <li>2. Line 120: Remove "thus".</li> <li>3. Line 166: Suggest consistently use "G1 gully" and "G2 gully"</li> </ol>	<p>Thank you very much for your valuable suggestion. In the revised manuscript, we will modify the expression according to your suggestions, replacing "quantities" with " parameters". Thank you again for your valuable suggestion, which helped us to express our research more clearly. Thank you for your valuable suggestion. Following your guidance, we have removed it.</p> <p>Thank you for your careful guidance and suggestions. We revised and use the expression of "G1 gully" and "G2 gully" uniformly. We greatly appreciate your suggestions once again for improving our expression.</p>
3	<p>4. Lines 206-207: I understand that the author is trying to express a prediction of the potential post fire debris flow damage to buildings in G2 gully. It is suggested to remove the content in parentheses "(after postfire debris flow occurrence)" or change "G2 gully under potential future debris flow scenarios" to avoid misunderstandings.</p>	<p>Thank you for your careful and valuable revision suggestions. We apologize for any confusion caused by the unclear expression. According to your professional guidance, we will modify this expression and correct it to future scenarios "G2 gully under potential future debris flow scenarios". We greatly appreciate your detailed guidance and kind reminder once again, which avoiding misunderstandings caused by our incorrect expressions.</p>

4	<p>5.Line 213 (Fig 3): This is a strong and clear methodological framework structure. Good logical flow from objectives to results.</p> <p>6. Line 228: Suggest changing the expression " percentage passing curve" to " particle size distribution curve ", consistent with the title in the figure.</p>	<p>We greatly appreciate your high recognition and praise of our research methodology and process framework.</p> <p>Thank you for your careful guidance and suggestions. We revised and use the expression of " particle size distribution curve" uniformly. Thank you again for your suggestion to help us make the expression clearer.</p>
5	<p>7. Line 256: Suggest unifying the units here by changing "(g/cm<sup>3</sup>)" to "(t/m<sup>3</sup>)".</p> <p>8. Line 337: Editing error, remove unnecessary commas after <math>\alpha_2</math> in Table 2.</p> <p>9. Line 379: In equation 11, it is recommended to clearly define <math>\rho</math> as the density of debris flow.</p> <p>10. Line 403: Despite the full name of the statistical function LNCDF being provided in the Introduction section, it is recommended to restate it here in the Methodology section before using the abbreviation.</p>	<p>Thank you for your careful discovery and valuable suggestions. We will revise and unify the expression of the unit. Thank you again for your suggestion.</p> <p>Thank you for your careful inspection and suggestions. We have corrected this editing error in the table.</p> <p>We greatly appreciate your valuable suggestion and apologize for this oversight. With your professional advice, we supplement the explanation of this variable <math>\rho</math> as the density of debris flow.</p> <p>Thank you very much for your careful suggestions and professional guidance on our manuscript. We add the full names of function abbreviations in the Methods section. Thank you for your comprehensive consideration.</p>
6	<p>11. Line 486: This is a commendable part of the work, as the author compared the differences in stability, sensitivity, and accuracy of different intensity indicators, reflecting the comprehensive consideration and innovation of this study.</p>	<p>We deeply appreciate your recognition regarding our work in the differences in stability, sensitivity, and accuracy of different intensity indicators, and believe that it reflects the comprehensive consideration and innovation of this study. Thank you again for your high praise discussion section of our manuscript.</p>
7	<p>12. Line 606: Suggest writing 'logical' in uppercase as ' Logical'</p>	<p>We would like to express our gratitude once again for your careful advice.</p>

	for unified editing throughout the entire text.	We will rewrite the name of this function.
8	13. Lines 695-702: I completely agree with the author's viewpoint that when two gullies threaten the village at the same time, an effective escape direction is crucial, which provides insights for developing disaster management and mitigation strategies. Practical, well-illustrated emergency response recommendations directly address the study's applied goal.	Thank you very much for recognizing the practical value of our research. We fully agree with your viewpoint regarding two gullies threaten the village at the same time, an effective escape direction is crucial, which provides insights for developing disaster management and mitigation strategies. This is also based on our consideration of potential disaster hazards in actual scenarios. Thank you for your recognition and positive comments, which have given us great affirmation and confidence.
9	14. Line 763: Suggest correcting the title of Appendix B part (b) from "Design frequency P=1%" to "Design frequency P=2%".	Thank you very much for your careful inspection and professional suggestions. Following your suggestion, we have corrected this editing error. Finally, we are profoundly grateful for your thorough review and expert guidance. Your comments have strengthened this particular study. Thank you again for your high recognition of our manuscript and positive comments, which has given us great confidence and help us improve our manuscript to meet journal standards. Should further clarifications be needed, we are fully committed to addressing them promptly. Thank you again for your valuable and professional guidance.
<b>Community CC2</b>	<b>Comments</b>	<b>Response</b>
1	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	Thank you sincerely for your exceptionally generous and insightful review of our manuscript. We are deeply honored by your praise and positive comments, which have greatly encouraged our team.  1. Regarding your affirmation of our work: We are truly honored and grateful that you found our study "interesting and valuable" for advancing

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.

debris flow disaster mitigation in mountainous regions. Your recognition that it meaningfully contributes to enhancing disaster prevention capabilities and offers important insights into post-fire debris flow assessments, vulnerability modeling, and emergency evacuation strategies is incredibly motivating. We especially appreciate your kind acknowledgment of the study's impact and detailed nature. Knowing that our research resonates with experts like you, whose perspectives are vital to the field, is immensely rewarding.

2. Regarding your praise for the discussion and emergency responses: We greatly appreciate your recognition and high praise of our discussion section and the proposed emergency responses. We fully agree with your assessment that promoting this work as a reference for future research is worthwhile, and we are pleased that you see its potential value for local residents.

3. Regarding your constructive suggestions: We sincerely appreciate your insightful comments and constructive suggestions for improving the manuscript. Following your guidance, we have carefully revised and supplemented the relevant sections. Our specific responses and modifications are detailed below.

4. Final thanks: Thank you once again for your valuable suggestions and recognition. We are deeply grateful for your encouraging feedback and actionable advice, which have significantly strengthened our study. Should any omissions remain in our revisions, we would welcome your further corrections. Please accept our profound gratitude for your mentorship

		throughout this revision process.
2	<p><b>Abstract</b></p> <p>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.</p> <p>2. Authors emphasize using the quantitative approach, but the results did not show any number or quantitative result. Please give the quantitative description.</p> <p>3. In the abstract, authors should highlight the significance of this research.</p>	<p>Thank you for your valuable suggestion. We improve the expression of the abstract section, and provide a more comprehensive summary of the current research status.</p> <p>Thank you for your valuable suggestion. The original abstract was intended to provide a condensed perspective on our proposed vulnerability assessment framework, with specific quantitative figures described in the Results and Discussion section. We will modify and supplement some quantitative numbers in the abstract according to your suggestions. Thank you again for your valuable suggestion.</p> <p>Thank you for your valuable suggestion. We continue to improve the abstract section and explain the significance of the research: “The proposed physical vulnerability model can be used to evaluate the structural resistance of buildings to debris flows in wildfire-affected areas, thus providing a systematic foundation for formulating risk management and mitigation strategies.” We further highlight this expression more clearly. Thank you again for your valuable comments and assistance.</p>
3	<p><b>Introduction</b></p> <p>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...</p> <p>2. Line 57: Suggest changing "continuous curve" to</p>	<p>1. Thank you for your valuable suggestion. We improve the introduction section. The importance of post fire debris flow disasters will be advanced before vulnerability analysis according to your suggestion. Thank you again for your careful guidance and assistance in improving our paper.</p> <p>2. Thank you for your valuable suggestion. We will revise this expression to make it clearer, and change it to "monotonically increasing curve".</p> <p>3. Thank you for your valuable suggestion. This means previous study.</p>

	<p>"monotonically increasing curve".</p> <p>3. Line 75, means "previous study"?</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>7. Line 138: Suggest changing "thereby burning" to ", burning".</p>	<p>4. Thank you for your careful guidance and suggestions. According to your suggestion, we use logical connectors to connect previous research work, and finally summarize the reasons for our selection. Thank you again for your suggestions on enhancing the expression of our paragraphs.</p> <p>5. Thank you for your valuable suggestion. The term used in Zhang et al. (2018)'s research is "relative intensity", but in order to be consistent with the entire text, we will clarify that relative strength here refers to "relative burial height". Thank you again for your careful suggestion.</p> <p>6. We greatly appreciate your valuable advice and professional guidance. We adjust the position of this paragraph, not as an independent paragraph. Thank you again for your valuable help in adjusting.</p> <p>7. Thank you for your careful suggestion. We modify it to "burning" according to your suggestion.</p>
4	<p><b>Study area</b></p> <p>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.</p> <p>2. Line 191, please provide the right information of China map, change it.</p> <p>3. Line 269, as for the 2.3 Debris flow peak discharge calculation, please give the main formula and list the derivation process to the Supplementary file.</p>	<p>1. Thank you for your valuable suggestion. We have carefully considered your comment regarding the paper framework. In the revised manuscript, we have moved the study area description to the Methods and materials section, as recommended. Specifically, the study area content is now integrated into Section 2.1 ("Field investigation and data acquisition"), with subsection "2.1.1 Study area" providing the geographical context, and "2.1.2 Field data collection" describing the field investigation methods. This reorganization ensures a clear and logical framework (Introduction, Methods and materials, Results, Discussion, Conclusion) throughout the manuscript. Thank you again for your constructive feedback.</p>

	<p>4. Line 213 (Fig 3): Capitalize "Flo-2D" consistently as "FLO-2D" in text within the figure.</p> <p>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".</p> <p>6. Line 326: Please clearly define n as Manning's coefficient and use the symbol "n" to express it uniformly in Eq. 7.</p> <p>7. Line 326: Similarly, please clearly define K in Eq. 7.</p> <p>8. Line 399: Suggest changing 'power law' to 'power-law'.</p> <p>9. Line 405: Please define "V" explicitly in Eq. 15 is "vulnerability value (0-1)".</p>	<p>2. Thank you for your valuable suggestion. We have provided the correct Chinese map based on the publication of the Ministry of Natural Resources, and the approval number (GS (2023) 2767) has been indicated on the map. Thank you again for your advice and help.</p> <p>3. Thank you for your valuable suggestion. We keep the main calculation formulas in the main text. Thank you again for your help.</p> <p>4. Thank you for your careful inspection and valuable feedback. We correct it to capital letters.</p> <p>5. We greatly appreciate your professional advice and guidance, which has made our expression clearer and more accurate. We describe this slope as steep and gentle.</p> <p>6-7. Thank you very much for your careful inspection and professional suggestions. Following your suggestion, we explain symbol "n" and "K" in the formula.</p> <p>8. Thank you for your valuable suggestion, which has made our word expression more accurate. We use the terminology 'power-law' suggested.</p> <p>9. Thank you for your careful suggestion. We have added the definition of V in the revised manuscript according to your suggestion.</p>
5	<p><b>Results</b></p> <p>1. Line 426: Please add the annotation "in G1 gully" to the title of Figure 7.</p> <p>2. Line 463: What's the meaning of <math>P = 2</math>?</p> <p>3. Lines 484-642: I greatly appreciate the author's extensive and in-depth exploration in the discussion section. They have done a</p>	<p>Thank you for your careful guidance to make our figure titles clearer. We will add this detail "in G1 gully" to the title of Figure 7. Thank you again for your help and suggestions.</p> <p>Thank you for your careful inspection. We apologize for this writing error and have corrected it to <math>P = 2\%</math>.</p>

	<p>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.</p>	<p>We greatly appreciate your recognition and high praise of our discussion section, which we believe is a meaningful and worthwhile work to promote. Thank you very much for agreeing with our comprehensive comparative analysis of different indicators and vulnerability functions. This is an important reference for future research. Thank you again for your praise and positive comments, which have given us great confidence. It is our honor to receive your affirmation.</p>
<p>6</p>	<p><b>Discussion</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>2. Change the order of 5.1.4 and 5.2; limitation and future work should be a separate</li> <li>3. Lines 490-523 &amp; Fig 13-14: In-depth comparative analysis of intensity indicators (sensitivity vs. precision) is highly valuable and a key contribution.</li> <li>4. Table 5, The expression in the second column is inaccurate. Please modify it. Adjust the format of the content in the table.</li> <li>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".</li> <li>6. Line 643: The authors' honest discussion of limitations enhances this excellent paper. I commend their approach to</li> </ol>	<p>Thank you for your valuable suggestion regarding the Discussion section (Section 5.1). We agree that this subsection should be more concise and focused. We have shortened Section by removing the detailed calculation steps and relocating them to the Methods section, where they fit more appropriately. We have also removed the three subtitles to improve the flow of the discussion. We believe these changes enhance the clarity and readability of this section. Thank you again for your help.</p> <ol style="list-style-type: none"> <li>2. We greatly appreciate your adjustment of chapter position. Following your guidance, we treat limitations and future work as separate sections.</li> <li>3. Thank you very much for your affirmation and appreciation. We fully agree with your point of view that this comparative approach is necessary and valuable. Thank you again for your recognition and praise.</li> <li>4. Thank you for your careful suggestion. We correct the expressions and adjust the format of the content in the table.</li> <li>5. We appreciate your professional guidance for making our expression clearer. We will revise this paragraph to "Table 6 provides the existing</li> </ol>

	<p>complex challenges and anticipate future work.</p> <p>7. Lines 689: These suggestions on emergency response and evacuation strategies for disasters are valuable for local residents.</p> <p>8. 17, Modify the display legend of the elevation.</p>	<p>vulnerability function models, including Logical, Weibull, Exponential, LNCDF and Avrami functions” according to your suggestion.</p> <p>6. We greatly appreciate your high praise, your recognition of our detailed limitations, and your interest and anticipation for our future work. Thank you again for your affirmation and confidence in us.</p> <p>7. Thank you for your positive and affirmative comments. We completely agree with your point of view that these emergency responses are very helpful for local residents.</p> <p>8. Thank you for your valuable suggestion. We improve the legend of the elevation display in the figure.</p>
7	<p><b>Conclusion and references</b></p> <p>1. Line 772: Add DOI number to references</p> <p>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.</p> <p>3. Further refine the conclusion section.</p> <p>4. Line 745, revise the author’s names.</p> <p>5. Check the references’ style, just like “-” and “—”, the space in the middle of the name abbreviation.</p>	<p>Thank you for this reminder. The DOI for all references has been added.</p> <p>Thank you for your careful suggestion. We check and unify it.</p> <p>Thank you for your valuable suggestion and improve the conclusion.</p> <p>Thank you for your comment, author name abbreviation in this place has been modified according to the style and requirements of the journal, using capital letters of the name.</p> <p>Thank you for your careful suggestion. We revise the format of references. Finally, we are profoundly grateful for your thorough review and expert guidance. Thank you again for your high recognition of our manuscript, which has given us great confidence to strengthen this study. we greatly appreciate your suggestions for helping us improve our manuscript, and we hope these improvements meet the journal’s standards for publication.</p>