Response to the Editor:

We sincerely thank the Editor for considering our manuscript for potential publication in the 'Natural Hazards and Earth System Science (NHESS)' journal and for sending it out for peer review. We appreciate the time and effort the editor and reviewers invested in providing constructive and insightful comments that helped improve the scientific clarity and robustness of our work.

We have carefully addressed all reviewer comments and prepared a detailed, point-by-point response to each. Necessary modifications will be made to the manuscript, and a revised version will be prepared incorporating all suggested changes to improve clarity, methodological transparency, and the interpretation of results, and to address the limitations of the current study. We believe that these revisions will significantly improve the overall quality of the manuscript, and we sincerely thank the reviewers for their constructive and thoughtful evaluation.

The responses to reviewer comments are provided in blue font, and the corresponding excerpts from the revised manuscript are shown in green italic font within the response document.

Reviewer Response

We would like to thank Harold Lovell and the anonymous reviewer for their careful evaluation and constructive comments on our manuscript. Here, we provide point-by-point responses to each reviewer's comments, clarifications where needed, and details of the revised plan for our present study. All the reviewer comments are in black, whereas the responses are in blue.

Reviewer 1 (Harold Lovell)

General comments:

This study presents evidence for previously unreported hazards/hazard cascades in a basin containing five glaciers (plus one more nearby) in the Western Himalaya. It is shown how several avalanches have occurred onto glaciers, in one case entering a glacial lake and triggering a small GLOF. These events appear to have been unreported at the time they occurred, indicating they had minimal impact on immediate downstream communities. However, the point is made that similar hazards in the future from the basin have the potential to be more problematic, and avalanche and GLOF modeling effectively demonstrates this. Thus, this is a useful contribution to the literature on a very important topic. I do however, think that improvements can be made to the paper as it stands,

particularly to streamline the text and figures and improve consistency of terminology and how this appears across the text and figures, in addition to a number of other minor edits to improve the clarity of the writing throughout.

Response: We are thankful to Dr. Harold Lovell for his constructive comments on our manuscript. We will make all necessary changes suggested by the reviewer and revise the figures and text as needed in the revised manuscript.

Specific Comments

The introduction could be more focussed and streamlined. It is currently quite long and I'm not sure all the paragraphs are necessary – see some of the technical suggestions below. There is some repetition too. The paragraph stating the aim of the project could be streamlined and shortened – focus on one or two sentences stating the purpose of the study.

Thanks for the comment and suggestion to revise and shorten the introduction section. In the revised version of the manuscript, we will shorten the introduction section to make it more streamlined

I'm missing a clear explanation in the results of the impact of the 2020 GLOF from Lake-A on Lake-B. Figure 12 suggests the GLOF could have entered Lake-B, but there is little apparent change to the lake. There is a sentence on this in the discussion, but a clearer explanation of this in the results would be useful – Figure 3 and 5 do not really provide good wider context of the lakes and their proximity to each other, so it is hard to appreciate this relationship in the results at present. Figure 12 does illustrate this relationship very nicely, but is a long way into the paper. I would actually suggest moving Fig. 12 to the results and providing a broader description of the interaction between the lakes during these events – this is of course important from a hazard cascade viewpoint.

Thanks for the comment. We would like to mention here that the magnitude of the 2020 GLOF from Lake-A was smaller, and the release appeared to be smaller. That resulted in a confined impact on Lake-B, which is just downstream of Lake-A. Here, we would also like to mention that meltwater from Lake-A flows directly into Lake-B, and both Lake-B systems are interconnected. Therefore, if such an event occurred in the Lake-A system, it would have greater potential to impact Lake-B, given their geomorphic settings. We agree with the reviewer that Fig. 12 should be placed in the Results section to provide a broader description. In the revised version we will incorporate these changes.

The schematic diagrams (Figures 11 and 13) are not really needed in my view. The sequence of events they describe is clear from the text and the other figures, so these diagrams add little value (and there already quite a lot of figures).

We will consider moving Figures 11 and 13 to the supplementary section.

Periglacial is used throughout, but in most cases I think proglacial is more accurate - particularly where you are referring to the areas in front of the glaciers/lakes.

Thanks for the comment. We also agree with the reviewer and, in the revised version, will refer to them as proglacial only for consistency.

Check consistency of labelling in text and figure. For example, you sometimes use “Lake-A, Lake-B” and other times “Lake A, Lake B”.

Thanks for pointing this out. We will move forward with only ‘Lake-A’ and ‘Lake-B’.

Figures: in quite a few places I found that adding labels to the figures would really help the reader, such as labelling Lake-A and Lake-B on relevant figures, alluvial fan (which is mentioned in the text but not on figures) and a few more besides. See some of the technical suggestions below.

Thanks for the suggestion. In the revised version of the manuscript, we will add a legend in the figures wherever required for more clarity

Technical suggestions

Abstract

Page 1, line 5: I don’t think “glacial lake outburst floods” needs to be capitalised in this way.

We will agree with the reviewer and revise it in the manuscript.

Page 1, line 21: “a” is missing before “potentially hazardous”. Also suggest “in its present condition” instead of “at the present condition”

Thanks for pointing this out. We will consider this in the revised version of the manuscript.

Introduction

Page 2, lines 2-5: It is not clear if this is referring to global glacier loss or regional loss in High Mountain Asia, for example. Suggest clarifying this as most of the references appear to relate to HMA (or HKH as you use).

Thanks for the comment. That was for the High Mountain Asia (HMA). We will mention HMA in the same sentence during the revised version.

Page 2, lines 10-12: Suggest “pose a challenge to” instead of “challenge”

We will change this in the revised version.

Page 2, lines 17-19: I’m missing the time period covered by these reported increases in lake numbers – is this still referring to the last three decades? Suggest adding this for clarification.

Thanks for the comment. We would like to note that the time period was 2001-2013 only in Ahsraf et al. (2017). We will add the same in the revised version.

Page 2, line 20: suggest adding “formed in front of retreating glaciers” after “glacial lakes to clarify that you are not dealing with ice-dammed or supraglacial lakes.

Thanks, we will add the suggestion in the revised version of the manuscript.

Page 2, lines 20-21: I don’t think “glacial lake outburst floods” needs to be capitalised in this way.

Thanks for the comment. We will go with glacial lake outburst floods (GLOFs) in the revised version.

Page 2, line 25: suggest “that threatens” instead of “and threatens”

We will change the same in the revised version.

Page 2, line 30: remove “and” before “affecting” as there is another “and…” later in the list.

Thanks for the suggestion. We will consider the suggestion and make the appropriate changes in the revised version.

Page 2, line 31: “destroying” would fit better with the verb form in the rest of this sentence.

We will consider the suggestion and make the appropriate changes in the revised version.

Page 3, line 2: suggest “have been” instead of “were”

We will consider the suggestion and do required changes in the revised version.

Page 3, lines 4-6 “which was amplified by the huge debris eroded along the channel where the 2015 Gorkha earthquake deposited the majority of the debris” – this is slightly untidy phrasing and could be improved.

We will consider the suggestion and make appropriate changes, rephrasing the sentence for better clarity in the revised version.

Page 3, lines 7-8: Why not simply: “The village of Til was impacted by bank erosion and collapse” ?

We will consider the suggestion and make the appropriate changes in the revised version.

Page 3, lines 11: Suggest “a GLOF” and “a debris flow”

We will consider the suggestion and make the appropriate changes in the revised version.

Page 3, line 20: “mass movements”

We will consider the suggestion and make the appropriate changes in the revised version.

Page 3, line 21: these two citations seem to relate only to GLOFs in the Himalaya, so

don't really support the "GLOFs and mass movements" and "globally and regionally" points. I suggest adding more refs here to cover these.

Thanks for pointing this out. We will add more relevant citations, such as the Global GLOFs database (http://glofs.geoecology.uni-potsdam.de/), Emmer and Cochachin (2013) (https://doi.org/10.14712/23361980.2014.23), which compares similar moraine-failure events from the Himalaya, the Andes, and North America; Lützow et al. (2023) (https://doi.org/10.5194/essd-15-2983-2023); and Zhang et al. (2024) (https://doi.org/10.1038/s43017-024-00554-w). This will support both global and regional studies related to GLOFs and Mass movements.

Page 3, line 23: "after" should be "since"

We will consider the suggestion and make appropriate changes in the revised version.

Page 3, lines 24: are "new" and "unreported" both needed here?

We will consider the suggestion and make the appropriate changes in the revised version.

Page 3, lines 24-26: what are "GLOF sources"? Does this mean lakes that produced GLOFs? Rewording this would improve clarity. "~95% moraine-dammed glacial lakes" needs to be integrated into the sentence better. "were located in the Himalaya" is needed.

We will consider the suggestion and make the appropriate changes in the revised version.

Page 3, lines 28-30: "Identifying these unreported past events is therefore crucial for reconstructing geomorphic process regimes and understanding the hazard frequency in mountain catchments". I would swap the order of these in the sentence – the contribution to understanding hazard frequency seem the important point that follows immediately from the preceding sentence. What are "geomorphic process regimes"? I feel that this could be rephrased in simpler language. Perhaps just "geomorphic processes"?

Thanks for the comment and important suggestion. We will rephrase the sentence for better clarity in the revised version.

Page 4, lines 3-13: This paragraph seems out of place. Either it should be incorporated in the study area section, or in the earlier paragraph in the introduction that describes some examples of GLOFs (although I would argue this is probably too many examples for there).

We will shorten this paragraph and combine it with the earlier one, using fewer examples of mass movements and GLOFs in the region for better readability.

Page 4, lines 14-31: These two paragraphs should be combined and shortened into a snappier "purpose of this study" paragraph. Twice in three sentences "Here, we…" is used, as an example. Save the details for the methods and elsewhere.

We will shorten them and also combine them.

Study area and importance of the region

Page 5, lines 2-19: watershed and catchment are both used in this paragraph, suggest sticking with one.

Thanks for the comment. To ensure consistency, we will use the term catchment in the revised manuscript.

Page 5, lines 4-5: how important is 0.8 km2 and .61 km2 in these values? Especially as the glacier data is reportedly >10 years (or more? 2000) old. Suggest rounding to whole integers.

Thanks for the comment. We will revise the manuscript as suggested by rounding or stating the year we are referring to with this area of glacier.

Page 5, lines 6-9: This data is presumably RGI outlines based on the citation, so it is important to state that here, and which version, e.g. RGI 7.0 (which you can cite directly, e.g. https://nsidc.org/data/nsidc-0770/versions/7). You should also then qualify the date stamp on these dimensions, which according to the RGI 7.0 information is "approximately the year 2000".

We used the RGI 6.0 boundary and corrected it using the respective satellite timestamp. Here, we state that we used the RGI 6.0 boundary and corrected it for the 2024 time period using PlanetScope imagery.

Page 5, lines 9-10: “are associated with proglacial lakes” – can you be more specific, are these glaciers in direct contact with the lakes? And can you say when this was the case?

Many thanks to the reviewer for highlighting this concern. Both glaciers are in direct contact with lakes. We will refine the sentence to increase clarity in the revised manuscript.

“In the glacier complex, Lakes-A and Lake-B are proglacial lakes associated with GL-A and GL-B, respectively.”

Also, as the dates of mass movements are the results of the current research, we remove them from the study area and the importance of the region section in the revised manuscript.

Page 5, lines 10-11: “…and have experienced mass movement events in September 2020 and 2005” – isn’t this the results from this paper? If so, I suggest removing from here.

Many thanks to the reviewer for highlighting this. As suggested, we will remove the specific information of the mass movement events from the study area and importance of the region section. This is discussed in detail in the results section of the manuscript.

Page 5, line 12 “Fariabad Nalla” – the spelling is different on Figure 1.

Thanks to the reviewer for pointing out the inconsistency in the spelling of Fariabad Nalla. To ensure consistency, we will use the spelling “Fariabad Nalla” throughout the revised manuscript.

Page 5, line 13: use “the Marusudar River” on both occurrences in this line. Where is this river located on Figure 1? Where is Yordu village?

We will revise Fig. 1 and annotate the Marusudar River and Yordu village. Yordu village is located at the junction of the Fariabad Nalla and the Marusudar River, ~58 km downstream of the Lake-B.

Page 5, line 14: Chenab River and Bandarkoot – are these beyond the Figure 1 study area? These should be labelled really.

River Marusudhar is a tributary of the Chenab River, and it merges into the main Chenab stream downstream of approx. 100 km downstream of the Lake-B. Therefore, we did not show them in Fig. 1, as our main aim was to highlight the glacier complex and the specific catchment with potential future risk.

Page 5, lines 16-19: this sentence “According to…” is out of place and would be better placed after you first introduced the glacier dimensions. You also don’t need the second citation to the same study.

We will reframe this sentence in the revised manuscript. We will also remove the second citation.

Page 5, line 20: These placenames should all be on Figure 1 in the same format (e.g. “Metwan” or “Metwan village”)

Thanks to the reviewer for pointing out the inconsistency. To ensure consistency, we will use the term “Metwan village” throughout the revised manuscript.

Page 5, line 26: what and where is the “Kishtwar Window”?

We will clarify this in the revised version.

Page 6, lines 3-7: Panel A - The shortened letters in the figure inset map need explaining: J and K, LDK, HP. Panels B and C - I’d suggest explaining what the different colour polygons are in the caption: red, grey and turquoise (presumably avalanche source, runout and lakes) – or add a legend.

Thanks for the suggestion. We agree and will explain the shortened letters and the different colour polygons in the caption.

Data and methods

Page 7, line 4: Suggest “images” instead of “imageries” and “imagery” - the next sentence calls them images.
Thanks for the suggestion. We will be using the term “images” in the revised manuscript.

Page 7, lines 5-9: These sentences can be combined to make the writing more succinct.

Thanks for the suggestion. We have combined and shortened the sentences in response to the reviewer's comments. The refined sentence is added below for the reviewer's reference.

“These images, captured during post-monsoon and peak ablation periods, were used to delineate glacier and glacier lake boundaries using normalized differential water index (NDWI) and standard FCC, respectively.”

Page 7, line 8: How are “past GLOFs” determined from satellite images?

Past GLOF events were identified based on the trench caused by the moraine breach and the debris fan deposited downstream. We will incorporate this information in the revised manuscript.

Page 7, line 8: spell-out “FCC”

FCC stands for "False colour composite." We will incorporate the expanded form into the revised manuscript.

Page 7, line 10: “images” not “imageries”

Thanks for the comment. We will use the term images throughout the revised manuscript for consistency.

Page 7, line 11: see comments on study area section about RGI – this should be clearly stated there too.

We state here that we have used the RGI 6 boundary, which has been rectified for each respective satellite image timestamp.

Page 7, line 12: again, how are past GLOFs identified from satellite images? More details are needed. How is ice calving detected, and is this dry calving or in the lakes? Did you examine temporal images to identify new calving events? More details also needed on this.

Thanks for the comment. We have used temporal PlanetScope imagery to understand changes on the glacier surface and to associate them with geomorphic changes. We have also manually identified the calving episode and NDWI-indexed it.

Page 7, lines 14-16: Mapping uncertainty – you use Landsat and Planet images, so which pixel size is used for the uncertainty analysis? State this here. It sounds like the mapping was mostly done from the Landsat data.
We mapped the 1999-2015 period using Landsat imagery, and after that (2016-2024), we used only PlanetScope imagery. For the Glacier mapping, we used a half-pixel buffer at the respective satellite image resolution, and for the lake mapping, we used a one-pixel buffer following Gransaw and Fountain (2006), and Racoviteanu et al. (2015). The same has also been mentioned in the text.

Page 7, line 28: "pre- and post-event PlanetScope imagery" – unless I'm mistaken, aren't some of your avalanches from before Planet images were available? Best to clarify this here.

Thanks for the comment. Yes, the 2005 avalanche occurred on GL-B, which is associated with a proglacial lake (Lake-B), which we identified using Landsat 5 (TM) and Landsat 7 (ETM+) imagery. For the 2020 avalanche on GL-A and GL-F, we have used pre- and post-PlanetScope images. We will rectify accordingly in the revised draft.

Page 8, line 16: "To estimate the future volume…", "we first matched its potential maximum extent…" – future volume and potential maximum extent of what?

Here, we refer to the future volume of Lake-B. To avoid ambiguity and improve clarity, the sentence will be revised accordingly in the revised manuscript.

"To estimate the future volume of Lake-B, we first mapped its potential maximum extent by reconstructing the glacier bed using a spatially distributed glacier ice thickness product combined with a DEM."

Page 8, lines 27-30: check "D. D. More" citation – this appears to include initials.

This will be revised as suggested in the revised manuscript.

Page 9, lines 2-6: "SC-1" etc. on the figure needs to be explained in the caption.

Thank you for the suggestion. The manuscript will be revised as suggested.

Page 10, lines 2-3: I think the Shugar et al. citation should probably come immediately after “the Chamoli event”.

Thank you for the suggestion. The manuscript will be revised as suggested.

Page 10, lines 3-5: Sentence beginning “Similarly,…” is missing some words.

Many thanks for highlighting the missing words in the sentence. We will revise the sentence for better communication in the revised manuscript. The revised sentence is attached below for the reviewer's reference.

“Similarly, in scenarios 2 (SC-2) and 3 (SC-3), avalanches of volumes 12.5 × 10^6 m^3 (moderate magnitude) and 6.25 × 10^6 m^3 (low magnitude) were simulated towards the lake, respectively.”

Page 10, lines 23: Sections 1-3 should be identified on a map somewhere.

Many thanks to the reviewer for highlighting the need to identify the source of the avalanche in a map. Accordingly, we will demarcate the avalanche source in Figure 10 in the revised manuscript.

Results

Page 11, lines 4-5: Figure 4 should be cited before figure 5, or perhaps the order of these figures should be swapped.

Thanks to the reviewer for highlighting the issue with the figure ordering in the manuscript. We will revise the manuscript to maintain consistency between figure ordering and their corresponding citations, ensuring that each figure is cited in the text before it is placed in the manuscript. Additionally, Figures 4 and 5 will be interchanged to improve the overall clarity and flow of the narrative.

Page 11, lines 8-9: “shifts in the thermal regime” – what is meant by this and how does it link to the “water-ice interactions”? More details needed here if you are to keep this interpretation.

Thanks for pointing this out we will revise it to “site-specific differences in / patterns of insolation” in the revised manuscript

Page 11, lines 12-14: sentence beginning “While Lake A…” doesn’t work currently. I

suggest removing “while”, “has” and “only”. Should this also be “Lake-A” for consistency?

Thanks for the comment. We will revise the sentence in the revised manuscript as follows to ensure grammatical correctness and overall readability.

“Lake-A (associated with GL-A) expanded by ~25.61% (from 0.051 ± 0.03 km^2 in 1999 to 0.064 ± 0.004 km^2 in 2020) before the 2020 GLOF event.”

Also, to ensure consistency, we will be identifying the lake as Lake-A throughout the revised manuscript.

Page 12, lines 3-7: It would make sense to use “Lake-A” here so the reader is clear how this name links to the figures.

Thanks for the suggestion. We will include Lake-A in the figure caption as suggested.

“Fig. 3. Evolution of the proglacial lake (Lake-A) and surrounding periglacial environment at GL-A from 1999 to 2024. Continuous sediment infill since 1999 led to bifurcation of the lake (Lake-A) by 2008, with a connecting channel visible in 2009; the main glacier shows consistent retreat throughout the period; the 2020 imagery captures the avalanche event and the fully drained lake following the GLOF. (Background images: Landsat for 1999 to 2015 and ©PlanetScope from 2016 -24)”

Page 12, lines 9-11: add labels to the fore-basin and main basin to Figure 4.

Thanks for the comment. We will revise Figure 4 by clearly labelling the fore-basin and main-basin regions to improve clarity and interpretation.

Page 12, line 9: alluvial fan should be used on Figures 3 and 4 too so it is clear what feature you are describing here.

Thanks for the comment. We will revise Figure 4 by adding labels to the alluvial fan.

Page 13, line 4: “proglacial” isn’t needed here.

We will remove the term “proglacial” from the sentence in the revised manuscript.

Page 13, line 7: can remove “(or floating ice)”

The words “(or floating ice)” will be removed from the revised manuscript.

Page 13, line 9: Why is the alluvial fan included in the lake basin area? Doesn’t this incorrectly inflate the lake area as there is no water where the fan is? This would then have knock-on effects on any further calculations from lake area, such as volume. I would just use the two basins where water is clearly visible for your lake area calculations, or provide a clearer explanation for including it.

We used this calculation to approximate lake basin volume, assuming no sediment infill, in order to estimate the infill volume (calculated as a difference between the theoretical no-infill lake basin volume and the estimated volume of the two basins). This will be clarified in the revised version of the text.

Page 14, line 16: suggest “infilled sediment”. Is this the alluvial fan? If so, it would be helpful to use the same terms.

The terminology will be checked and unified throughout the text.

Page 14, lines 17-18: “Following the event, satellite imagery revealed breaching of the Lake-A moraine, extensive GLOF outwash, and subsequent deposition in the downstream channel.” – here is one of the places where it would be good to understand how this GLOF then went on to impact Lake-B, immediately downstream.

Many thanks to the reviewer for highlighting the GLOF mechanism near Lake-B post Lake-A failure. There were no geomorphic indicators of breach of Lake-B, such as a reduction in Lake-B area, trenches on *moraine, or a debris fan downstream.

Page 14, line 18 to page 15, line 2: You seem to be suggesting that the lake formed entirely from melting of ice in the drained basin, what about meltwater inputs from the various glaciers that feed the basin? These surely also had an input. Also, debris can’t strictly melt so suggest rephrasing.

Many thanks to the reviewer for the suggestion. We agree with the reviewer that meltwater from glaciers (GL-A, D, and E) has also contributed to the reformation of the proglacial lake to its previous extent. We will modify the manuscript accordingly.

Page 15, line 3: Remove “Again” because this is a different glacier.

We will rectify this in the revised version.

Page 15, lines 8-10: “water seepage” – what do you mean by this? Meltwater emerging from this side of the glacier for the first time? This is also not immediately obvious from the figure, so you should label exactly where you infer this is happening and explain what the evidence is for water seepage.

Thank you pointing this out. Based on the temporal image analysis, we observed water drainage resulting from basal melting along the left margin of Lake B. This was mentioned in Fig. 5 as a retreat (see the time stamps for 2012 and 2014). However, for clarity, we will rectify them accordingly in the revised version of the manuscript.

Page 15, lines 10-11: “This seepage contributed to the development of extensive crevassing” – why is this the case? Further explanation is needed as the link between water emerging from the glacier and increased crevassing is not immediately clear to me.

Thanks for the comment. We agree that the linkage between water seepage and basal melting was insufficiently explained in the original text. In the revised version, we will clarify the physical processes connecting meltwater seepage and crevasse development.

Page 15, line 15: “However” is not needed here.

We will remove it in the revised version.

Page 15, line 16: “after” should be “since”. The comma after “Owing to this” should be moved to line 17 after “size”.

We will rectify as suggested during revision.

Page 15, lines 18-21: Sentence beginning “It is also noted…” needs to be edited and rephrased and is doesn’t work currently.

We will rephrase this sentence for more clarity.

Page 16, lines 2-6: It would make sense to use “Lake-B” here so the reader is clear how this name links to the figures.

We will include 'Lake-B' after the word 'proglacial lake' in the revised version. It can be read as

"Fig. 5 The evolution of the proglacial lake (Lake-B) and……."

Page 21, line 12: "the" is not needed before "Lake-B".

Revised as suggested.

Page 22, line 15: Delete "at". Check spelling of "MaruSudar"

We will remove the 'at' and replace the word as 'Marusudar' in the revised version.

Page 22, line: "reach" instead of "are reaching"

We will revise accordingly.

Discussion

Page 25, line 4: See also recent paper for this point, which could be cited here: Pepin et al. (2025) - https://www.nature.com/articles/s43017-025-00740-4

Thank you for your suggestion. We will cite the relevant literature in the revised manuscript.

Page 25, lines 9-10: "Zheng et al. (2021) reported that at least 21 GLOF events occurred per year in the region from 1900 to 2016, with the majority being unreported (Zheng et al., 2021a)." – how can GLOFs be both reported and unreported? Suggest rephrasing this so it is clear what is meant.

Here, we mean to state that Zheng et al. (2021) identified 21 new GLOFs that were not reported in other studies in the region. However, for more clarity, we will rephrase this sentence.

Page 25, lines 11-13: Suggest defining "unreported GLOFs" here – these are GLOFs that were not reported at the time they occurred? Or have not previously been reported, but have been identified retrospectively? Note "GLOFs" not "GLOF".

Unreported GLOFs mean GLOF events that have occurred in the past but have not been documented or reported due to their remote location or minimal impact on the downstream. Also, due to minimal to no impact on downstream areas, such GLOF

events are often not reported at the time they occur; they are identified retrospectively based on geomorphic processes and signatures. We will revise these lines for greater clarity.

Page 25, lines 14-16: This sentence would be better placed in the paragraph before, after the sentence ending with the citation “Harrison et al. 2018”.

We will revise the same accordingly.

Page 28, line 2: “proglacial” would be a better term here than “periglacial”.

Thanks. We also agree with the reviewer's observation. We will change “periglacial” to “proglacial” in the revision.

Page 29, lines 10-12: Unless I missed it, this is the first time I see reference to the 2020 GLOF not impacting Lake-B. I think this should be explained clearly earlier in the results.

We will clarify this in the results section and state that during the 2020 Lake-A avalanche and outburst, the magnitude was smaller and did not reach or affect Lake-B.

Page 30, line 9: “The Lake-B present…” should be “Lake-B presents…”

Revised accordingly.

Page 30, lines 13-14: “High-resolution imagery shows that several settlements have emerged near the river in the past two decades” – the imagery shows that the settlements are there, but not that they have emerged as it is a single timestep. Suggest rephrasing

Thanks for the suggestion. We will rephrase it for clarity in the revised version.

Page 30, line 15: “could” not “can”

Thanks for the comment. We will change it to “could”.

Page 31, lines19-22: sentence starting “Recent observations…” – this is repetitive from the paragraph above, remove and merge the final sentence in this paragraph with the previous paragraph.

We will merge and shorten this paragraph with the above one and reduce the repetition in the revised version.

Page 31, lines 27-28: “We reconstructed…” – the way this is phrased, it could be mistaken for a description of different avalanches, but you are still talking about the same ones from the previous paragraphs. Editing the phrasing here would improve this link and the fluency of the writing.

We will rephrase as suggested.

Page 32, line 16: “Mass-wasting”… until now this term hasn’t been used I don’t believe, but mass movements has. I suggest you use consistent terms unless you intend there to be a different meaning here.
Thanks for pointing this out. We will use “mass movement” rather than “mass-wasting” through out the manuscript.

Page 32, line 28: “GLOFs”

We have modeled three scenario-based process chains for future GLOF events in Lake B. However, we have only routed the GLOF water downstream for the high-magnitude scenario. So, the term "GLOF" is suitable here, as we are discussing only one of the three modeled outputs.

Page 34, line 4: “MaruSudar River” – check spelling as it is different elsewhere.

We will change it as “Marusudar”

Page 34, line 5: Make sure these locations are labelled on a map somewhere.

Figure 10 will be updated with these locations, which are downstream of the Lake-B

Page 34, paragraph 1, final sentence: Could also add 2022 Shisper Glacier GLOF in the Karakoram, which caused a lot of damage to infrastructure: Muhammad et al. (2021: https://www.tandfonline.com/doi/full/10.1080/19475705.2021.1975833)

Thanks for the suggestion. We will cite Muhammad et al. (2021) in the revised manuscript.

Page 34, paragraph 2, final sentence: “In this region” – suggest you are more explicit that you mean the basin you have studied.

We intended to state, “in the Himalayan region.”

Page 34, paragraph 3, first sentence: do you mean the “modelled high-magnitude scenario flow channel” – suggest adding this if so.

We will add this as per suggestion

Page 35, paragraph 1, first sentence: remind the reader that SC-1 is the worst-case scenario.

We will mention here as *“.....respectively in SC-1 (worst-case scenario)”*.

Page 35, paragraph 1, sentences 2 and 3: these are currently grammatically incorrect sentences and should be merged or edited.

We will merge as well as edit both sentences 2 and 3 for better clarity.

Page 35, paragraph 1, sentence 4: what form could an early warning system take? A stream gauge of some sort to detect increased discharge? Some detail here would be helpful.

For the Early Warning System (EWS) near the lake, we can deploy several in situ instruments, such as a water-level detector, a time-lapse camera, and an automatic weather station, while downstream, sirens/alarms and automated messages and warnings can help detect any abnormal changes in the upstream region. We will add the details in the revised manuscript.

Page 35, paragraph 1: “Also, for a conservative approach effective adaptation requires integrated approaches that combine glacial lake hazard assessments with community-based vulnerability evaluations and social protection policies.” – I can’t follow this sentence at present, it should be rephrased.

We will rephrase this sentence for better clarity.

Page 35, paragraph 1, final sentence: the last bit of this sentence is unnecessary as this has just been stated in the previous sentence.

We will remove this and merge with the previous sentence for readability.

Conclusions (note - no line numbers here)

Page 35, paragraph 2, first sentence: “past two and a half decades” – why not “25 years”?

We will accept this as 25 years as per the reviewer's suggestion.

Page 35, paragraph 2: “mass-wasting” – see previous comments on whether “mass movements” would be better, given the article title.

As mentioned above, we will continue with mass movement throughout the manuscript and replace mass wasting.

Figures

Figure 1: Adding an arrow to the GLOF path in panel (B) would be helpful. Make sure all placenames mentioned in the text are labelled on the maps wherever possible, and spellings match between text and figure. Label Lakes A and B.

We will update Figure 1 to reflect the suggested changes. Few places, such as Bandarkoot and Chenba River, are very downstream, and this particular Fig 1 captures the extent of Lake-B catchment, so therefore, that will not be covered. However, we will add other village locations accordingly to avoid confusion. We will continue to refer to Lake-A and Lake-B throughout the manuscript.

Figure 4: Adding arrows to the drainage paths would be helpful. Label fore-basin and main basin

We will revise Fig. 4 to include the fore- and main basins in the figure, with corresponding text. We will also indicate the drainage path with an arrow.

Figure 6: The avalanche runout label is not very clear – it took me a while to realise this related to the red dashed outline because the label overlaps with the glacier outline. Suggest making this clearer.

The red dashed line shows the avalanche runout. The extent of glaciers and runout overlap may be causing confusion. For clarity, we will add text which will mark the avalanche runout.

Figure 7: Label avalanche runout.

Thanks. The red outline shows the avalanche runout. We will change this figure and label the avalanche runout for clarity.

Figure 9: panel labels are lowercase letters here, elsewhere they are capitals.

We will continue with lower case letters as panel labels and wherever it was in capital will be changed as lower case.

Figure 10: the bridge symbol should be in the legend. Yordu is in the caption but not labelled on the figure.

Fig. 10 already has the legend of the Bridge in the top centre with a triangle symbol. However, Yordu was not mentioned in the figure which will be added in the revised version.

Figure 11: I'm not convinced this schematic figure is required – the events depicted here are already described well in the text and Figure 3.

We will move them to the supplementary section.

Figure 12: Suggest moving this to the results. Panel labels are lowercase letters here; elsewhere, they are capitals

We will continue with the lowercase panel label, as this pattern was used in most of the figures, despite Figs. 1, 11 and 13. We will change the uppercase panel label to lowercase wherever necessary for consistency.

Figure 13: Similar point to Figure 11 – this isn't really needed in my view, and there are already quite a lot of figures.

We will move it to the supplementary section.

Figure 14: This seems like it would fit better in the results too.

Through this figure, we were trying to show the vulnerability of the debris flow and future mass movement. We still consider this as part of the discussion where we tried to show and discuss the potential zone of erosion and deposition, and also the past events that occurred in the catchment.

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