Reviewer 2 comments

1. Based on OSL chronology, surface exposure ages, field investigations and geomorphic analysis, the manuscript suggested that glacial coverage of the drainage contribute significantly to sediment aggradation and mass wasting processes could modify the post-depositional of terrace.
   - We appreciate your feedback and have answered each point individually below.

Main comment:

1. The motivation of this work is unclear, the introduction provided a broad overview of climatic, glacial, and short-term mass wasting processes on Himalayan rivers, but the central scientific questions remain insufficiently defined.
   - We understand the concerns of the reviewer and agree that the introduction only provides a general overview of climatic, glacial, and short-term mass wasting processes. During previous fieldwork, we noted the colluvium on the terrace surfaces, indicating substantial mass movements potentially long after terrace deposition. As the study area is experiencing recurring mass movements, we think that establishing a timeframe for such surface-alternating processes can help to identify potential trends, e.g., with changing climate. We added a detailed motivation and main goal explanation to the introduction. We also added a sentence to the end of the discussion reflecting on these goals.
2. A major methodological concern is the absence of dedicated sections describing the fluvial-terrace mapping and potential past glacial boundaries. The manuscript just put some description in Fig 1 and caption which is insufficient. This is the basis for analyzing the impact of glaciers on the study area's watershed.
   - Thank you for pointing this out. We agree with the comment and have added a new Methodology section (3.3), explaining both approaches in detail. We also refer to this section now in the figures showing the terraces or past glacial boundaries.
3. Although Joshi et al. (2022) is extensively used, the manuscript does not adequately distinguish the previous framework from the new contribution of this study.
   - We see the concerns of the reviewer because the previous study of Joshi et al. (2022) already provided an extensive OSL framework of the studied terraces. While most of our obtained luminescence chronologies do not differ significantly from Joshi et al. (2022), we think that the new dates complement the existing chronology, because we focus on the lower terrace levels, where Joshi et al. (2022) have few or no ages. To differentiate our aggradation discussion based on the luminescence ages, we focus on the comparison with the southern part of the Dhauladhar Range. This provides a unique opportunity to compare catchments that were affected by extended glaciation to those that were not. We think that using the combined chronology of both studies for this comparison is valid, as it enables a more precise classification of the observed cycles. In addition, the main new addition of this study is the 36 cosmogenic surface exposure ages. While the previous study by Joshi et al. (2022) mentions debris on some surfaces, their work concentrates on the fluvial aggradational sequence below. Because we are able to identify the widespread Holocene overprint of the terrace surfaces, we think this is an exciting new finding, and we did not expect to find the same young ages on all terrace

surfaces, whether they feature colluvium on top or not. This shows that all terrace surfaces within two mostly steep Himalayan valleys were affected by mostly Holocene overprint. We added one sentence to the end of the discussion supporting our argument.

4. The reason for selecting both the Ravi and Suil Rivers should be clarified. In Suil River, the TCN samples are much more than the OSL samples.
   - We agree that the sampling strategy between the two catchments warrants further explanation. The Ravi and Suil Rivers were selected together because the Ravi controls the regional base level, and (with one exception) the terrace sequences are continuous across both catchments. Given that previous work (Joshi et al., 2022) established similar OSL ages across these systems, we did not anticipate major chronological disparities in the fluvial terraces. Consequently, our sampling strategy focused more heavily on TCN exposure dating of terrace surfaces in the Suil catchment to test for small exposure-age differences. The Suil catchment provides a valuable comparative setting as it features slightly gentler mean slopes and fewer headwater glaciers than the main Ravi catchment. We have added a dedicated explanation clarifying this rationale in the Introduction (Section 1).
5. The authors should provide more evidence that GLOFs influenced the terraces surface in the Ravi river.
   - We emphasize that we present this as a hypothesis, and we list several arguments that support this hypothesis. We have modified our text to reflect that this is a hypothesis and indicate that large floods do not need to be related to lake outbursts, as it has been shown in the recent (August 2026) catastrophic flooding within Tibet and Nepal. Due to several recent and Holocene catastrophic floods throughout the Himalaya (Montgomery et al., 2004; Borgohain et al., 2020; Shugar et al., 2021), we argue that surface overprint through floods is a reasonable suggestion, at least for the lower terrace levels, which we also clarified in the section. The presence of some large (> 5m diameter) rounded boulders within the Ravi also indicates potential transport by larger floods.

Minor comments

1. Line 23 “Late-to-Mid Holocene reworking (~7 – 2 ky) on all but two terrace surfaces” are not consistent with Line 550 “All ages derived from 10Be and 26Al, except one, document Holocene surface activity”
   - We agree that this can cause a misunderstanding, because we were specifically referring to “Mid- to Late Holocene”. We modified Line 550 so that it uses the same definition and sample numbers.
2. Fig 1 should add some position information, thus, readers can find the information described in the geological background within the fig.
   - We added the same cities and villages of Figure 2 to Figure 1 for orientation.
3. Line 314 “we obtained only Holocene ages, except for one sample SD17CRN12, with 16.5 ± 1.5 ky” were not consistent with table 1.
   - Thank you for pointing this out. Indeed, the sample name was wrong; it should be SD17CRN02. We corrected this in the revised manuscript.
4. Line 248 “T9 level (120-140 m)” Or “130-167m”
   - Yes, this was incorrect, as we already referred to the lowered height at the Chamera Dam. We corrected this.

5. Line 323 “The two oldest 10Be ages (JK-22-36 and SD17CRN12) are obtained from the highest terraces levels preserved above the current Ravi River”. The previous text stated that these terraces were not included in the category of the study.
    - Thank you for spotting that. The wording was incorrect because we referred to the single isolated level for JK-22-36 and the highest common level (T10) for SD17CRN02. We corrected the sentence.
6. Table 1 and Table 2 should add the sample terrace level
    - Thank you for mentioning this; we added the level to both tables.
7. Line 463 1-3 meters should be 1-3 m.
    - Changed. We also changed other instances where it could be shortened.
8. Line 476 5 mm/kyr should be 5mm/ky, should be consistent with the whole manuscript
    - Yes, this was the only instance with kyr. We corrected it.
9. the Discussion refers specifically to ~50% of the Ravi catchment as potentially glacier-influenced, whereas the Abstract and Summary appear to attribute ~50% glacial influence to the Ravi and Suil catchments collectively. This inconsistency should be clarified.
    - Yes, this was not expressed consistently. We corrected the wording in the discussion section, as we always refer to the collective catchment.

- In addition to the above comments, the author should carefully review the standardization of the language usage and the consistency of the entire text.
    - We checked the manuscript and corrected a few inconsistencies.

References

Borgohain, B., Mathew, G., Chauhan, N., Jain, V., and Singhvi, A. K.: Evidence of episodically accelerated denudation on the Namche Barwa massif (Eastern Himalayan syntaxis) by megafloods, Quaternary Science Reviews, 245, 106410, https://doi.org/10.1016/j.quascirev.2020.106410, 2020.

Joshi, M., Thakur, V. C., Suresh, N., and Sundriyal, Y. P.: Climate-tectonic imprints on the Late Quaternary Ravi River Valley Terraces of the Chamba region in the NW Himalaya, Journal of Asian Earth Sciences, 223, 104990, https://doi.org/10.1016/j.jseaes.2021.104990, 2022.

Montgomery, D. R., Hallet, B., Yuping, L., Finnegan, N., Anders, A., Gillespie, A., and Greenberg, H. M.: Evidence for Holocene megafloods down the tsangpo River gorge, Southeastern Tibet, Quat. res., 62, 201–207, https://doi.org/10.1016/j.yqres.2004.06.008, 2004.

Shugar, D. H., Jacquemart, M., Shean, D., Bhushan, S., Upadhyay, K., Sattar, A., Schwanghart, W., McBride, S., van Vries, M. W. de, Mergili, M., Emmer, A., Deschamps-Berger, C., McDonnell, M., Bhambri, R., Allen, S., Berthier, E., Carrivick, J. L., Clague, J. J., Dokukin, M., Dunning, S. A., Frey, H., Gascoin, S., Haritashya, U. K., Huggel, C., Kääb, A., Kargel, J. S., Kavanaugh, J. L., Lacroix, P., Petley, D., Rupper, S., Azam, M. F., Cook, S. J., Dimri, A. P., Eriksson, M., Farinotti, D., Fiddes, J., Gnyawali, K. R., Harrison, S., Jha, M., Koppes, M., Kumar, A., Leinss, S., Majeed, U., Mal, S., Muhuri, A., Noetzli, J., Paul, F., Rashid, I., Sain, K., Steiner, J., Ugalde, F., Watson, C. S., and Westoby, M. J.: A massive rock and ice avalanche caused the 2021 disaster at Chamoli, Indian Himalaya, Science (New York, N.Y.), 373, 300–306, https://doi.org/10.1126/science.abh4455, 2021.