Carlo Tacconi Stefanelli
Department of Earth Sciences - University of Firenze
Via La Pira, 4
50121 Firenze, Italy
tel.: +39 055 2757783 / fax: +39 055 2757788
E-mail: tacconi.carlo@gmail.com
carlo.tacconistefanelli@unifi.it

December 9, 2023

To the Editorial board of "Natural Hazards and Earth System Sciences"

Dear Editor and Reviewers,
thanks for the time spent on the review. Below we insert a point-by-point response to the reviewer comments.
All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.
Thank you for your precious time and consideration; I look forward to hearing from you.

Sincerely,
Carlo Tacconi Stefanelli

In red are reported our answer to the comments of the Authors (Lines numbers are referred to the track-changes file of the manuscript):

Anonymous Referee #1

The paper concerns the susceptibility assessment of landslide dams in a large area of Central Asia.

The paper is well structured and undoubtedly represents a good, albeit preliminary, attempt to identify the landslides that can potentially obstruct the riverbeds in this area.

However, the scale used is too small to allow us to go into detail and for this reason the study represents a preliminary phase of investigation which, however, can allow to subsequently concentrate the attention on the areas identified as more critical. This should be said more explicitly.....

-Thanks, due to the size of the studied area, our work is certainly a preliminary study. We tried to emphasize this aspect which was not sufficiently clarified in the Abstract, Introduction and Conclusion (Lines 29, 168, 630).

A limitation of the paper is the scarce attention paid to the geology of the studied area, only summarily described in chapter 2. One suggestion is to insert a geological map, even if on a small scale, of the study area, which allows to identify the possible relationships between outcropping lithotypes (and formations) and the degree of entrenchment of the hydrographic network, which is certainly an element predisposing to the possibility of riverbed occlusion due to landslides.

-We have integrated a map (Figure 2, Line 118) of the geological setting of the area as suggested to get an overall view of the formations and main faults present.

Finally, one doubt concerns the plot of Figure 2 and the resulting linear equations, on which the whole methodology described and applied is based.

Do the plot and the proposed equations have a general meaning? For extreme combination values between the two parameters considered (volume of the landslide and width of the valley), the answer is surtely yes;; this is not the case for intermediate values, so much so that the authors insert a central band which presumably represents a field of uncertainty... Is it true?! If so, this should be explained better...

Or the linear equations have been deduced from an analyzed series (Where? For how many cases?).

The suggestion is to better explain the meaning of the plot of Figure 2 and of the linear equations that follow from it, clarifying the above doubts.

-The equations proposed with the former-Figure 2 (now Figure 3) are the results of previous works to which reference is made in the text (Tacconi Stefanelli et al., 2016; 2018; 2020). To clarify its meaning, much of Chapter 3 Materials and Methods has been revised, in particular the paragraphs starting with Line 132, 144, 160 and 166 have been rewritten.

Other minor details and typos are indicated in the attached PDF file.

- Thanks again for the careful review, we agree with all the comments on the attached PDF and we reviewed the text according to them. In particular, we really appreciated the corrections regarding the incorrect formatting of references (missing commas and semicolons) and some missing or incorrect citations.

Anonymous Referee #2,

Dear authors,

thank you for your contribution. I have following suggestions.

General comment: I understand that according to the scale the results have some limits and authors agree with more detailed study in future. Nevertheless, would it be possible to include a chapter (into Discussion) about verification? I mean to consider significant landslide (rockfall) events from the literature review a compare how they fit (or not?) with the presented results.

-Thank you for your suggestion. In chapter 5 Discussion a substantial part has been added (from Line 585) in which some landslide dams from the literature have been examined and compared with the results of the analysis carried out in our manuscript as validation of the method.

Another doubt is about the geological setting. I agree that using this scale is impossible to consider geological setting because of large variability of the region. Nevertheless, what about to consider main fault zones? Because those structures predispose more frequent jointing and could serve as detachment zones for large slope movements. As well as relation to seismic zoning (seismic intensity) will higher the credibility. On the other hand, this comment is just for authors, for next possible more detailed paper. It is not necessary to enlarge the scope of this paper.

-As suggested also by the other reviewer, a map was added to describe the geological setting and main faults present in the study area.

Specific comments: What is important is to improve the content of Conclusion. It is to general, vague, and rather short. Main results from the paper will stress the scientific value.

-As rightly underlined, Chapter 6 Conclusions has been almost completely rewritten and improved, highlighting the improvements compared to the original method, the limitations and the practical and scientific contribution of the main results obtained.

Technical comments: For detailed comments see the enclosure, please.

- Thanks again for the careful input in reviewing our work, we agree with all the observations on the attached PDF and we included your comments in the new version of the text. In particular:

-We add the suggested references (Falátková, 2016 and Kropáček et al., 2021 in Lines 124-125);

-The sentence from Line 125 have been clarified adding "(such as lithological predisposition, faulting zones, steep slopes)"

-Figure 7 (former Fig 6) have been enlarged;

- The sentence from Line 385 have been slightly rewritten to make it clearer as "a different orographic and valleys morphology".