In their submitted manuscript, Allen et al. propose a hazard assessment around two existing and one potentially forming proglacial lake in the Puiqu River basin, Himalaya. They document the glacial environment as well as its projected development under future climate conditions, potential outburst flood triggers and modeled discharges in vulnerable downstream communities. The study gives insights into different aspects of glacial lake outburst floods highlighting particularly interesting features of the investigated cases. However, it is difficult to grasp how relevant the scientific insights from this investigation are given that the authors' judgement is too often limited to qualitative assessment. For a scientific journal submission, I was expecting more substance in view of reproducibility and representativeness of the results (see major comments below).

Besides my main criticism, this manuscript is well written and easy to follow. The figures will benefit from annotations and some other modifications.

Fabian Walter.

MAJOR COMMENTS

My main point of criticism is that the reader of this manuscript is left with little information on how to assess validity or accuracy of the findings. In its current state, the study appears more like a presentation of important facts and qualitative judgements, which are typical for technical reports. For a scientific paper I would have expected some critical assessment of the flood risk, e.g., a benchmarking of the presented methods against previous occurrences of outburst floods. The authors cite accounts of previous outbursts in the area (Line 106). Could they be used for this?

The first part of the paper presents some motivation on why to study the chosen three lake basins. However, it is not possible to verify that this corresponds to a worst-case analysis. In this case, it would be necessary to show that no lake basins could produce more serious outburst floods. As the authors argue, this depends on moraine dam geometry, water volume and trigger potential. Under these aspects it cannot be argued that the presented set of lakes is representative for worst case scenarios.

At too many parts of the manuscript, the authors' qualitative judgement is presented as a scientific result. In particular, in the Section "GLOF likelihood", various factors influencing or triggering outburst floods are presented, but I could hardly find any objective arguments. It seems that the only one is the estimate of a dam-overtopping wave volume, which can be 10 times as high as the "incoming mass". Here and elsewhere in the manuscript, it has to be made clear that the conclusions are based on solid scientific grounds. Otherwise, a "low probability" could indicate one catastrophic event every 5 years as opposed to several ones per year. This is not what the authors imply. In a similar sense, it is not clear what the demanded "comprehensive and forward-looking approach to disaster risk reduction" is. To me, such an approach should always be taken and I see little connection to the present study or any finding, which made the suggested strategy particularly pertinent to the Poiqu River basin compared to any other place in the world.

SPECIFIC COMMENTS

I suggest including a cartoon explaining different lake formation scenarios and specifically the hydrological base line. To be honest, I had to stare for some time at Figure 3 of Benn et al. (2012) to understand this concept. On the other hand, I never grasped the meaning of the "the lowest point where the glacier surface intersects the terminal moraine" (it seems that by definition, the glacier and the terminal moraine should not intersect). Similarly, when the future evolution of the lakes is described, longitudinal profiles would be extremely helpful. This would help the reader to understand Figures 7 and 8 and appreciate the shown information.

The flood model is a key ingredient to this investigation. Although I agree that too many technical and mathematical details are not appropriate for this study, I was wondering what the main parameters and boundary conditions of this model are. Apparently, the flood volume, some time scale of drainage initiation and dam geometry play a role and it would be interesting to hear how these parameters drive the model.

Lines 45-47: "… most scientific attention has focused upon …" I do not agree with this statement. In the jökulhlaup literature, ice-marginal and subglacial lake drainages have also received a lot of attention. Whereas I cannot say which scenario has been most prominent, I would refrain from an absolute statement on scientific attention.

Lines 175-176: "B_w and h_b are fully obtained" measured?

Line 178: Reference for HEC-RAS is needed.

Line 185: Reference for DEM's is needed.

Line 189: Reference for Manning roughness value is needed.

3.2 Lake susceptibility assessment: Presenting the likelihood calculations seems appropriate here.

Line 231: "considering the factors outlined by …" these factors should be specified.

Line 257: I suggest a paragraph break here.

Line 457: "recent removal of much of the frontal moraine …" this needs a reference.

Lines 466: What are "capacity building programs"?

FIGURES

Figure 1: The lakes at Cirenmaco and Jialongco are difficult to discern.

Figure 2: The font sizes are a bit small, but h_b defined in Panel A seems to disagree with Panel B.

Figure 4A: Where is the lake? The blue outline or the light blue polygon? A different color scale for maximum flow height would help.

Figure 5: It is difficult to tell where the lakes are. I do not see any blue patches.

Figure 6: The two images in Panels C need some annotation. What does the reader see in these images? Why is one so dark and the other one bright? What happened between the two?

Figure 8: This is the future lake site, right? Where will the lake form? The colored outlines make little sense and are hard to sea. Which direction does the ice flow?

Figure 9: Some arrows and annotation as well as scale bars are needed.