

Interactive comment on “A New Remote Hazard and Risk Assessment Framework for Glacial Lakes in the Nepal Himalaya” by D. R. Rounce et al.

Anonymous Referee #1

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The authors present an interesting and useful contribution to the increasingly important research concerning techniques and methods for early hazard assessments related to potential outburst floods in large mountain regions. Their pragmatic approach is certainly worth publishing as: (1) adequate discussion of comparable approaches described with sufficient literature citation;(2) developing a new holistic remote sensing based approach which could be promising applied in other mountain regions, e.g., in the north slope of Himalaya;(3) comprehensive state knowledge of the eight glacial lakes in Nepal was summarized followed by propose explanation, which help guide future field campaigns and risk-mitigation strategies. However, after assessing the manuscript the authors submitted, I think it is necessary to work on improvements before it is satisfactory for publication. (1) In 4.1.1 Mass movement trajectories, page 10. Here avalanche only indicated ice avalanche? How do you consider the snow

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avalanche? Can the thickness of ice avalanche be largely calculated using the average surface slope of the dangerous glacier (see Wang et al., 2012)? Please discuss it. (2) The DEM data based MC-LCP GLOF model lack the ability to model the different aftermaths caused by flash flood or debris flow. Inundated area by flood or debris flow can bring different catastrophic Consequence, the downstream impact of eight glacial lakes in Nepal Himalaya modeled MC-LCP GLOF model was only resulted from flash flood? (3) In 4.1.6 Downstream Impact, it is better if a Table or Chart was used to illustrate the potential downstream impact classes. (4) In 4.2 Risk classification and management actions, how do you think the changes of permafrost? The permafrost degradation is ubiquitous in Himalaya, it likely makes the glacial lakes more susceptible both in dynamic and self-destructive failure. And the permafrost degradation detected by INSAR was reported recently. (5) How do you obtain socio-economic data (e.g. buildings, agricultural land etc.) the downstream of the eight lakes? Is it cited from ICIMOD, 2011? Or obtained from remote sensing images? (6) In the manuscript, the errors of lake area and change rate were not described. It had better explain the errors in the paper, e.g., explain it at the bottom of Table S7 by note. (7) For preciseness, the yellow line denotes the S.Chamlang Tsho should be added in Figure 1. (8) Please add the detailed source information of images of Figure S1-S7.

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