We appreciate Anonymous Referee #1 for his or her instructive comments of our manuscript. At present we'd like provide a general reply to these questions.

Anonymous Referee #1

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The authors present a study of the state and historical evolution of glacial lakes in the Poiqu River basin in the Himalayas. The subject is interesting to a wider public, mainly due to the speed of the on-going changes that take place at high altitudes in the Himalayas caused by climate warming.

The paper gives a thorough description of changes that take place in the region. There are 20 figures and 13 tables illustrating every aspect of that description. Unfortunately, the paper is rather disappointing. The description of changes that take place in the region, manifested by a decrease of glaciers and an increase of glacial lakes, is too long and too detailed, while a synthesis of the changes is missing. At present, the reader does not learn much new about the processes involved.

Reply: Thank you very much for the comments. Indeed, in the original manuscript, we gave too much detailed description of glaciers and glacial lakes, especially glacial lakes, and ignored the discussion and analysis of multi-year change trend. The description of the overall changes of glaciers and glacial lakes is not comprehensive and in-depth in section 4 of "variations in glaciers and glacial lakes". After submission of the original manuscript, we have collected additional data of the local geological and geomorphic backgrounds, which will be incorporated in the revision text to give a better and comprehensive picture of the glacial lake changes at regional scale. We will rewrite section 4 to include new discussions on the chapter 4.1 "the distribution and trend of glaciers and glacial lakes", the chapter 4.2 "the development and change of typical glaciers and glacial lakes in the study area, and the causes and trends of the changes from history to future. At the same time, we will delete some tedious details of the 5 typical glacial lakes to improve the readability.

It is claimed that those changes depend on local conditions, with snow-melt being predominant source of lake water increase at high altitudes while the melting glaciers are mainly contributing at lower latitudes. The water balance equation (WBE) developed follows simple, standard assumptions. The only data processing is applied to derive annual changes in the lake water volumes based on historical satellite images from the time period (1977-2016) and the available elevation data.

Reply: In the original manuscript, we did not explain the data clearly enough in the chapter 3

"Data sources". And we mainly introduce the source and accuracy of the image data. In the later revision, we plan to add a chapter 3.1.2 to introduce the source and accuracy of the image data and meteorological data. All the data, which involved mainly include the relevant meteorological data in WBE, will be introduced in detail.

The calculation formula WBE is more suitable for the regions with a paucity of data. The WBE ($\Delta V = \Delta P + \Delta G - \Delta I - \Delta E$) follows a simple standard assumption, but parameters, calculation of ΔP, ΔG, ΔI and ΔE are the selected formulas for the regions with a paucity of data.

The authors compare the WBE model water volume estimates with observed water volume changes; however the accuracy of the modelled and observed values is not given. Therefore we do not know what the predictive power of the WBE model is. It would be also interesting to learn how the approach described can be generalized to other case studies

Reply: In the original manuscript, we have introduced the data sources and accuracy of the image but not explained the data clearly enough. In the later revision, we plan to add a section to explain the dominated processes in glacial lake changes and reinforce our assumptions for the WBE. All the involved data in the WBE will be specified in details.

In the present form, the WBE $\Delta V = \Delta P + \Delta G - \Delta I - \Delta E$ involve the formula as follow:

$P_R = f\,(R, Q_\mathrm{R}, S, \theta, K)$

$P_S = f\,(T, I_R, \rho_S, k, S, \theta, K)$

$G = f\,(T, I, \rho_G, \sigma, S, \theta, K)$

$I = f\,(K, GSD, J)$

$E = f\,(T, I_R, v, p, \varepsilon)$

The above formula contains the following parameters:

1. The geomorphic parameters are achieved by satellite image, including drainage area contributing to the lake (S), the geomorphologic factors such as slope (θ) and lake area (A).

2. The meteorological data is achieved from National Meteorological Data Center (http://data.cma.cn/), including rainfall intensity (R), snowfall (P_S), rainfall quantity (Q_R), temperature (T), solar radiation (I_R), and wind speed (v).

3. Parameters are measured by field and indoor experiments, including snow density (ρ_S), snow permeability (K) and glacier density (ρ_G).

4. The parameters are obtained by querying the past information, including fracture density (σ),

surface saturated vapor pressure (p) and turbulent energy (ε) .

In the later revision, we plan to describe the approach how to calculate WBE more clearly, and give a more exhaustive comprehensive calculation formula, discuss the reliability and the possible error. It may be useful to generalize to other case studies.