In this study, the authors developed a rock glacier inventory of the Guokalariju (GKLRJ) region, located in Tibetan Plateau, providing important information on the distribution and the characteristics of these periglacial landforms. In the first part of the manuscript, identification, delimitation and classification of rock glaciers in the GKLRJ region was carried out through visual interpretation of satellite images. In the second part, the authors estimated the volumes of water stored in rock glaciers and glaciers through different methods and equations. The study revealed 5'057 rock glaciers in the GKLRJ, whose spatial distribution varies according to the climatic and topographic conditions of the three sub-regions analyzed. The volume of water stored in rock glaciers was estimated to be between 1.31-3.04 km^3, that is about 33% of the water storage present in the glaciers.

The manuscript is well written and contributes to increase knowledge on distribution and characteristics of rock glaciers located in the GKLRJ region, as well as their water significance as long-term reservoirs. However, before the publication of this manuscript, the authors should address some general and specific comments, which are listed in the following lines.

General comments

- Introduction: The impacts of the climate change on permafrost are numerous and slope instability is only one of them. It would be interesting to describe in a more complete way the different impacts of permafrost degradation (e.g. on the thermal condition of the ground, on ice content, etc.).
- Material and methods: It would be useful to explain in this chapter the different upslope boundary types used for delimitation of rock glaciers and add the reference to figure 2 in the text (it is missing).
- Results: This chapter presents several statistics on the distribution of the rock glaciers based mainly on the results of the ANOVA test. However, the chapter on Material and Methods lacks an explanation of the statistical analyses performed (type of statistical test, dependent and independent variables, control of test assumptions, significance level, etc.). In addition, it would be useful to summarize the results of ANOVA test in a single table in the results.
- Tables 2 and 3 are missing in the manuscript.

Specific comments

Line 40: "long term hydrological reserve" instead of "largely inert hydrological reserve"

Line 65: please add in figure 1 letters (b), (c) and (d) associated with the different sub-figures. Also add the references to the sub-figures in the text.

Line 76: orders of magnitude of irrigated agricultural area and population density in this region?

Lines 91-92: missing spaces in the figure caption: "altitude(ASTER", "ELA(Liu", "2012)for"

Lines 174-175: please add the letters (a) and (b) associated with the two subplots in the caption text. Also add the reference to the subplot 3b in the text.

Line 183: please add in figure 4 letters (a), (b), (c) and (d) associated with the different subplots. Also add the references to the sub-figures in the text.

Line 185: missing spaces in the figure caption: "(a)the", "(b)RA", "(c)R2" and "(d)R3"

Line 199: "mean area" instead of "mena area"

Line 219: "(Fig. 6)" instead of (Fig.6)". Space is missing.

Line 220: please add the references to the sub-figures of figure 7 in the text.

Line 221: "rock glacier activity states" in the figure caption is not correct, as this term is associated with the differentiation between active, transitional and relict rock glaciers. In this case, the rock glaciers are classified according to the upslope boundary type. In addition, it would be desirable to explain in the figure caption the different subplots associated with letters (a), (b), (c) and (d).

Line 237: "km^3 (see Table 5)" instead of "km^3(see Table 5)". Space is missing.

Line 324-326: it would be desirable to move the ANOVA results to chapter 4.

Lines 342: it would be helpful to briefly explain how the Permafrost Zonation Index was modeled by Gruber (2012), specifically describing the model parameters considered. Also add the references to the sub-figures a) and b) in the text.

Line 364: "degradation" instead of "thawing"