Report #2

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We highly appreciate the constructive review, and the detailed comments on the manuscript. The 'discussion section' will be reduced to avoid repetition with the 'results section', and we will revise the references to figures and tables in the discussion and only keep the essential references. Detailed comments are addressed below.

Very nice work on the effects of vegetation types on nutrient availability and supply in the paramo.

I have only one general concern which relates to the ´Discussion´ section. I feel it may be reduced to some extent. As I read this section, it seemed I was reading a ´Results and Discussion´ section as many of the results were again described. Additionally, I am not used to finding so many figure and table referenced in a Discussion section.

I have also added some comments, suggestions and corrections on the manuscript itself, which the authors need to consider before publication.

L49 : How about nutrient inputs through rainfall ?

Correct, this was missing in the text and will be added.

L67 : I completely agree with the authors in that the Andes are particularly very interesting, However, these few lines do not really describe high altitude grasslands in the Andes (paramos)… Average cool air temperatures occur, however, extreme oscillations and very high temperatures (especially close to the ground) do constantly occur. Mean annual precipitation is also variable between paramos, and ´above 500 mm´ does not really describe it. Under clear skies, extremely high evaporative demands occur so ground evaporation and transpiration rates may not be necessarily low…

We will add more information on the specificities of the high Andean ecosystems with the diurnal oscillations in air temperature, regionally variable precipitation amounts and temporally variable evaporative demands (Carabajo-Hidalgo et al., 2023 ; Páez-Bimos et al., 2023).

L141 : At what height were temperature and humidity sensors placed?

The meteorological station is installed by ETAPA following the WMO guidelines. The sensors are placed at 2.5 m height above the terrain. We will provide information on the height of measurement in the revised manuscript.

L145 : It would help to know what the authors mean by ´most´… maybe in terms of %…

The effective rooting depth corresponds to the zone where the majority (estimated at > 90%) of the root biomass is present, and corresponds to the maximum depth at which vegetation used plant-available water. We will provide this information in the revised manuscript.

Table 1 : Are Y and N necessary in this table? The significance level is enough to indicate wether it is Y or N…

Yes, that is correct. We have simplified the table, and now only mention the p-values.

L289 : « Forests experienced more water stress » -> this information is not enough to refer to «water stress ».

The soil water content is systematically lower under forests than cushion-forming plants and tussock grasses (Fig. 4). In the driest month, the soil water content drops to 0.45 cm^3 cm^{-3} in some forested sites. Soil water retention curves established in the laboratory showed that the SWC at the permanent wilting point (pF = 4.2) of soils under forests is about 0.33 – 0.43 cm^3 cm^{-3}. As such, during the driest months, trees might experience water stress. We will rephrase this part in the text, to clarify that this is based on the data on SWC variations and the water retention curves.

L457 : Relationship between vegetation types, soil characteristics and land use? How may anthropogenic disturbances influence these relationships?

We will rephrase this sentence, and refer to land use policies related to livestock grazing, soil labor and use of fire.

We checked the missing references, and will add this information in the revised manuscript. Also, other typos will be corrected.

References cited herein

Carabajo-Hidalgo, A., Sabaté, S., Crespo, P., Asbjornsen, H.: Brief windows with more favorable atmospheric conditions explain patterns of Polylepis reticulata tree water use in a high-altitude Andean forest, Tree Physiology, 43(12), 2085–2097, https://doi.org/10.1093/treephys/tpad109, 2023.

Páez-Bimos, S., Molina, A., Calispa, M., Dellmelle, P., Lahuatte, B., Villacís, M., Muñoz, T., and Vanacker, V.: Soil–vegetation–water interactions controlling solute flow and chemical weathering in volcanic ash soils of the high Andes, Hydrol. Earth Syst. Sci, 27, 1507–1529, https://doi.org/10.5194/hess-27-1507-2023, 2023.