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## >> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

## Submitted Abstract

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Abstract

Mountains are widely recognized as a source of freshwater for adjacent lowlands. In particular, the glacierized catchments in the tropical Andes provide water resources that buffer the high precipitation seasonality in the region. However, both climate and socioeconomic changes bring important challenges for water supply. For example, local communities in Peru have reported a decline in water resources. Nevertheless, model outputs do not show changes in total precipitation. Instead factors like low access to infrastructure, socioeconomic context, and geographical location have been identified as possible drivers for the perceived scarcity. Moving towards interdisciplinary approaches can help clarify such types of mismatches and better understand water management within the coupled social-ecological system.

Herein, we aim to understand the relationships between the livelihoods of water users and water resources. More specifically we examine the role of water in the livelihoods of communities along a gradient in elevation at the header of the Vilcanota-Urubamba basin, Peru (3019 km2) the second largest tropical glacierized mountain range (170 km2) worldwide. Water resources supply water for domestic use, agriculture, livestock, and hydropower production. Water availability was assessed through a hydrological simulation at a monthly time step from 1981 to 2016. Livelihoods were assessed using the Sustainable Livelihoods Approach by collecting data from 154 surveys about the natural, social, physical, financial, and human capitals related to water security, and by grouping participants as farmers, livestock farmers, or domestic water users.

Results suggest that only the social capital differs along the altitudinal gradient. This could be explained by the fact that in the lower catchment the major investments on water infrastructure occur along-side a strengthening of water organizations and therefore the social capital. We also find that capital assets varied by user type, with domestic and farm users often having significantly higher capitals than livestock farmers (except for financial capital). These differences suggest that livelihoods of water users depend mainly on the role instead of the altitudinal gradient. When examining specifically high natural capital users (i.e. those with high water availability) we find that they are strongly associated with both higher physical (i.e. infrastructure) and social (i.e. group instead of individual) capitals. On the contrary, the access to high water resources does no provide a particular benefit for non-natural livelihoods. These results suggest that user type matters substantially to manage water resources. Further, improving water access may pass through improving access to infrastructure and implementing water associations.

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