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Future water supply and demand in the Peruvian Andes: assessment and implications

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The aim of the ACCESS project is to help assess the impact of climate change on socio-economic development in the Peruvian Andes, focused on the Ancash region, and to help identify adaptation strategies. As part of this larger effort, we are aiming to understand how climate change will impact: water availability and quality; farming, lives and livelihoods; and to work with local communities to plan adaptation strategies. The current water supply and demand in two catchments in the Cordillera Blanca and two in the Cordillera Negra is being assessed to understand the background water context in contrasting glaciated and non-glaciated landscapes. Based on detailed surveys of the ancient and modern waterscapes led by South American archaeologists, supplemented by more recent data from hydrological measurement and ethnographic surveys and discussions with local communities, a nuanced picture is emerging of how communities have adapted to past and current climate conditions, and potential solutions are being co-developed with the local communities to maintain and improve livelihoods in situations with low rainfall in the Negra and glacial retreat in the Blanca. Crop water demand during the dry season in the Rio Ancash (114 km²) catchment has been assessed using the CROPWAT model and local climate and crop survey data, and the present-day water supply assessed through the gauging of rivers and irrigation canal flows, and measurement of water quality and isotopes. Preliminary results, for the Rio Ancash, suggest the amount of water available for dry season irrigation on the mid-slopes is approximately 70 mm over the cropped area (57 km²) which appears to be less than the crop water demand, though this estimate may change as more data is processed. Initial climate projections suggest an increase in water as the glaciers melt until around 2050. The dry season crop water demand and supply beyond 2050 is currently being estimated.