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# Water Sustainability in the Peruvian Andes with Accelerated Glacier Retreat: The Case of Mantaro Valley

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The glaciers in the central Peruvian Andes are in accelerated retreat leading to a serious negative and irreversible impact in the water availability of the Shullcas river watershedand severe consequences for local water resources. To understand the glacier retreat process and propose low-cost adaptation measures that effectively address social needs, state of the art science and technology are being used. Aerial photography and satellite images are used to evaluate changes in the area of glacial ice retreat and the results shows a reduction of surface area from 35.6 to 14.5 km2,a reduction of 59.4 % from June 1976 to June 2006. Altitude ice profiling with LiDAR to constrain volume loss, and a hydrochemical and isotopic mass balance approach are used to estimate percentage contribution of glacier melt water to stream flow. To compensate the future reduction of water availability in the downstream Mantaro valley, a socially and economically consistent adaptation measure is being proposed through water resources management approaches and innovative techniques for collecting and storing precipitation water.