

IMPACTO DEL CAMBIO CLIMÁTICO EN LOS RECURSOS HÍDRICOS DEL RÍO QUILLCAY, PERÚ

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Abstract

Peru is one of the most vulnerable nations to climate change, among others, due to the variability in the availability of water resources, according to the latest Assessment Reports of the IPCC. Therefore, estimating variations and changes of the hydrological resources is a task of great importance. The present study evaluates the impacts of the RCP 2.6 and RCP 8.5 emission scenarios on the water resources of the Quillcay sub-basin. For this, a semi-distributed hydrological model was built at a monthly time step with the RS Minerve tool, simulating glaciated and non-glaciated subcatchments. Hydrometeorological information from field stations was completed through different methodologies. Firstly, the completed information was used to calibrate and validate the model in the historical period 1983 - 1998. Subsequently, the series of precipitation and temperature of the regional model RCA4 were used to estimate a future water balance in the period 2021 - 2050. These series show an increase in temperature between 1.0 and 1.5 ° C and a reduction in precipitation between 2 and 10% for RCP 2.6 and RCP 8.5, respectively. Under these conditions the total annual contribution of Quillcay sub-basin decreases from 220 hm³ for the historical period to 169 (RCP 2.6) and 162 hm³ (RCP 8.5) for future water volume. During the period without precipitation (June, July and August) this reduction is greater, going from 29.1 Hm³ in the historical period to 19.1 and 15.8 Hm³ in the scenarios RCP 2.6 and RCP 8.5 respectively. This is mainly due to the reduction of the glacier contribution caused by changes of the climatic conditions. As a result, deficits will further rise, increasing the urgency of the implementation of structural and non-structural management measures for an integrated water resources management which also needs to take into account changing water consumption patterns.

Keywords: *Quillcay, cambio climático, glaciares, modelo hidrológico, Cordillera Blanca.*