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EVOLUTION OF THE GLACIER COVERAGE AND ITS INFLUENCE ON THE WATER AVAILABILITY OF THE BLANCO RIVER SUBBASIN – SANTA RIVER BASIN

JOSÉ HITOSHI INOUE VELARDE [(1)]

[(1)] Facultad de Ingeniería Geográfica, Ambiental y Ecoturismo, Universidad Nacional Federico Villrreal, Av. Colonial 450, Lima, Perú
jose.hitoshi@gmail.com

ABSTRACT

The objective of the research is to know the variation of glacier coverage in Blanco river subbasin order to establish its influence on water availability. For this, the glacial coverage of the Blanco river subbasin during the 1987-2016 period was evaluated as a first step. Then, the water behavior of the Blanco river subbasin was evaluated with the purpose of estimating the discharge by thaw. Finally, the future scenarios of glacier coverage, the glacial water reserve (volume) and the discharge by thaw (m^3/s) were determined. Techniques of GIS and Remote Sensing, the dependent-slope thickness method, hydroclimatic regionalization, flow analysis, duration curve, water balance and the deterministic-stochastic Lutz Scholz model were applied. From the results it was found that the glacial coverage has regressed by 23,5% (8,87 km^2) during the 1987-2016 period, with an average retreat rate of -0,35 km^2 /year. Likewise, the glacial water reserve (volume) was reduced by 30,4% (299,1 x 10^6 m^3) and with an average retreat rate of -13,1 x 10^6 m^3 / year. On the other hand, taking into account the months of low water, which show a significant decrease in rainfall, it was obtained that the discharge by thaw on average is 1.78 m^3/s, this type of flow being the main source of supply water of the rivers at this time of year. Finally, it was estimated that by 2050, the glacial coverage and glacial wáter reserve will be reduced by 44,7% and 57,0% respectively from the values found in the year 1987 and the discharge by thaw will have an approximate value of 1,2 m^3/s.

Keywords: Glacier coverage, glacier water reserve, discharge by thaw, water availability, Blanco river subbasin

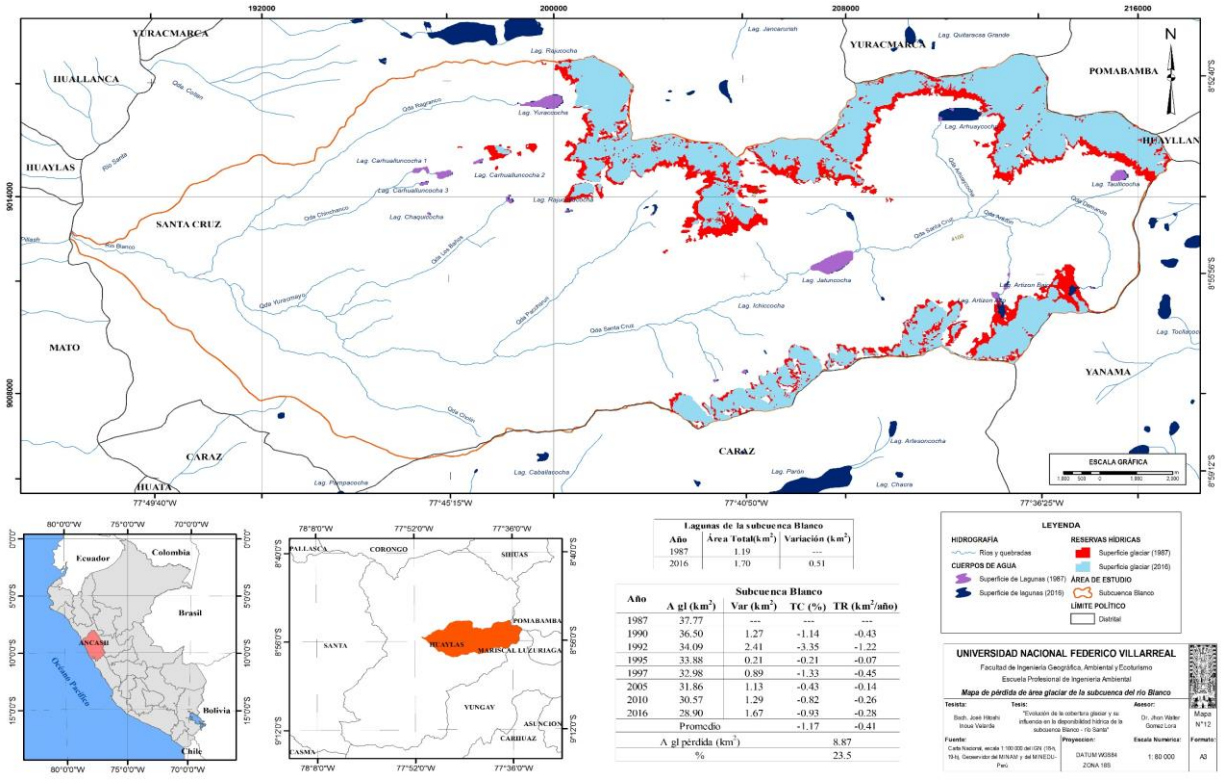

Figure 1. Pérdida del área glaciar de la subcuenca del río Blanco.