

Influence of glacial retreat on natural hazards of the Palcacocha Lake area, Peru

Landslides

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- Vít Vilímek (1) Email author (vilimek@natur.cuni.cz)
- Marco Luyo Zapata (2)
- Jan Klimeš (3)
- Zdeněk Patzelt (4)
- Nelson Santillán (2)

1. Department of Physical Geography and Geocology, Faculty of Science, Charles University, , Prague 2, Czech Republic

2. Unidad de Glaciología y Recursos Hídricos, INRENA, , Huarás, Peru

3. Institute of Rock Structure and Mechanics, Academy of Sciences, , Prague 8, Czech Republic

4. National Park Administration, , Krásná Lípa, Czech Republic

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Abstract

In this article we describe natural hazards associated with outburst floods of Palcacocha Lake and landslide events on the slopes of its moraine dam, in Cojup Valley, Cordillera Blanca (Peru). These events occurred in the last 70 years and some of them resulted in disasters, which strongly affected the city of Huarás. Field investigations and reference expression hydrodynamic tests as well as archive satellite images and aerial pictures were used to describe the evolution of hazards connected with Palcacocha Lake. Expression hydrodynamic tests proved a high permeability of sandy gravels glacial sediments, which form the present-day lake dam. Seepage through the natural dam forming small ponds below the overflow spillways occurs. A retreat of the glacial tongue causing an increase of the lake volume and unloading of the slope toe areas are the most important recent processes that influence the potential hazards affecting the Cojup valley. The research has proved that the climate warming and ongoing deglaciation play a very significant role in the change of natural hazards conditions in high mountains.

Keywords

Glacial lake Outburst floods Moraine dam Cordillera Blanca Peru

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