

Archaeoseismology in the Inka Sacred Valley and in the Cuzco region, an interdisciplinary approach for past seismic impacts characterization on Cultural Heritage as a new marker for paleoevents?

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Too often, the seismic hazard evaluation in the Andes is limited to the subduction zone. While it is true that the most powerful earthquakes that affected the Pacific fringe (Lima, 1746; Arica, 1868) had little impact on the Altiplano, this area exhibits a combination of strong seismic hazard and high vulnerability through the presence of active fault segments in densely populated areas (Benavente et al., 2013). Nonetheless, unlike the coastal region where resilience is taken increasingly in account, as a result, in particular, of the violent 2007 Pisco earthquake (D'Ercole et al., 2007), the seismic risk remains largely overlooked in the Highlands. In a such iconic city like Cuzco, the erratic population growth and its consequences on the organisation of the urban landscape represents a further challenge that enhance the risk exposure. The incomplete knowledge of the Quaternary geological settings of the Cuzco region as well as the low recurrence of devastating earthquakes on crustal faults in general lead to a progressive loss of the "risk culture" achieved by the Inkas and their megalithic architecture. To face such difficulties, archaeoseismological approaches demonstrated that disturbed architectural remains may be used as valuable markers (Rodríguez-Pascua et al., 2011) to extend the catalog of palaeoseismological studies (Rosell Guevara, 2018). Moreover, the huge consequences of the damaging events that struck Cuzco in 1650 and 1950 might suggest a similar impact of earthquakes during pre-Hispanic times. Registering and mapping the past seismic effects in Inka citadels like Machu Picchu and Choquequirao as well as sudden variations in constructive techniques of monumental heritage is therefore an interesting tool to provide additional data (recurrence, social impacts) to properly assess the seismic risk and detect "prehistoric" events. Based on an interdisciplinary program, our results will complement other evidences of deformation, issued from fault trenching and proximal lake coring (PATA project). The overall purpose is to extend the knowledge and time window for the local crustal fault activity and emphasize the importance of the seismic risk in the area. Raising awareness will be the first step towards developing risk management policies and implementing mitigation measures to preserve the local Cultural Heritage. Within the framework of this meeting, we aim to present the preliminary results obtained during the two field campaigns in 2019, which are confirming the relevance of Inka sites as good "seismoscopes".

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