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The effect of pre-Hispanic agriculture practices on soils in the Western Cordillera of the Peruvian Andes (region Laramate, 14.5°S)

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An integrated geoarchaeological study focuses on a group of three archaeological sites. This study comprises soils on pre-Columbian artificial terraces against their nondisturbed pedological context. Six terraces and three soils lacking of archaeological evidence and actual use, are examined to identify morphological and geochemical features generated by the sustained agrarian use. Aim is to understand the land-use and pedological history of the Laramate region, as an agricultural center in pre-Columbian times.

Preliminary results show recurrent sequences within the terraces, characterized by two edaphic cycles; a poorly developed Ap modern topsoil is underlaid by one well-preserved 2Ah paleosol. Analytical data shows prehispanic terraces as a sustained agricultural system. Marked by its use and position, higher availability of nutrients and deeper soils, are found at agricultural terraces, located over a debris cone. Significant charcoal fragments for radiocarbon dating at Ayllapampa and Sihulca archeological sites, with a minimum age for terrace construction of Cal 1 sigma AD 675-766 and 782-893 respectively; it remains unclear if another stage of construction.

There is no evidence that the terraces have alternated between periods of cultural decline and boom. Rather, reconstructions or modifications to the original structure and the absence of paleosols, address to a continuous use until its abandonment. Today, they produce only under fallow-system. There are no archeological signs of massive irrigation systems (Reindel 2011, pers. comm.). Its installation could only be linked to more favorable climatic conditions, like those described for The Early Horizon (800-200 BC), The Early Intermediate Period (200 BC-600 AD), and The Late Intermediate (Period 1000-1438 AD) (Eitel et al. 2005, Mächtle 2007).

As reported on other archeological sites in southern Peru (Branch et al. 2007), an extensive terrace agricultural system during the Middle Horizon (500-1000 AD) could be also attested in the Laramate area. Retention of eroded loessic material transported against the terrace walls could be associated to periods of increased geomorphodynamics founded in the surroundings by 600 AD (Forbriger & Schittek 2011, unpublished raw data).

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