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Geomorphologic evaluation and valoration of geological hazards in the Quebrada valley and Dique Los Sauces-La Rioja, Argentina

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The investigation work took place in La Rioja province, NOA region of Argentina, in a place called La Quebrada. It is located at the entrance of the Los Sauces Dike, a tectonic valley, where a stable community resides alongside temporary residents in the summer periods. This region constitutes the touristic corridor of the Sanagasta Valley and the Costa Riojana, which implies an important anthropological activity that increases the risks due to landslides, extraordinary rains and regional seismicity.

It's a poorly studied region in relation to geological hazards. Thus the detection, definition and valuation of geological and anthropological risks is important in the area to elaborate on the risk and vulnerability, necessary for the planning and decision making to ensure the sustainable use of the territory.

The lithological units in the area were located according to the geographic coordinates. The photographic references and height control points were taken in a Trike flight with GPS to elaborate DEM, geological and geomorphological cartography, hillside and slopes orientations and cartography alongside with the hazard susceptibility of the area. The geology of the area was defined as well as the morphodynamic process characteristics and impact that take place in it. This was complemented with conceptual analysis to give the frame of reference in which every contemplated aspect is qualified and classified.

In conclusion the most frequent processes in the gully and the Los Sauces Dike are the dry gravitational slides. Those of major magnitude are represented by the detrituses avalanches in areas of maximum dependent. Rainfalls, run-off erosion and human action constitute the trigger factors of the events of mass removal observed. Geological hazard susceptibility of landslide type covers 70% of the area, corresponding to areas from high to very high susceptibility, related to slopes greater than 25° and limited to the mountain area bordering the creek.

