

Topic: Investigating potential precipitation changes and related impacts on small-scale farming in mountain villages, Cordillera Blanca, Peru

Research Center(s): Climate and Cryosphere*

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Description: Small scale subsistence farmers on the slopes above the city of Huaraz in the Peruvian Cordillera Blanca attribute recent challenges in agricultural production, in part, to decreasing precipitation during the early crop cultivation period in August and September. In general, local climate is characterized by low annual variation in air temperature but a strong seasonality in precipitation. While the driest conditions prevail in June and July, precipitation increases gradually towards the October to April wet season, with strong topographically induced gradients. For farm fields without access to river-fed irrigation, on-site precipitation is a crucial prerequisite for any kind of cultivation. Because seeding occurs soon after the core dry months, cultivation is highly vulnerable to potential alterations in the transition period from dry to wet conditions. However, there are other factors complicating the attribution of the agricultural changes: there is evidence for intense deforestation (that may cause increased soil erosion and reduced water storage capacity) and there are indications for the transition from traditional to industrial seed products. The resulting impacts may be similar to those of altered precipitation characteristics. Within our work we study potential precipitation changes.

The availability of meteorological information for proving precipitation trends is generally very poor for our study region. Nevertheless, we currently investigate the potential of connecting ground measurements with the output from a global atmospheric circulation model. If data accuracy is insufficient, we need to explore more sophisticated atmospheric modelling. An equally promising approach would be studying the impact of land use and seed type changes by experts in these fields for synopsis.

Keywords: Alpine meteorology, climate change, climate vulnerability