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Advancing scientific base lines for the integrated assessment of climate change impacts and adaptation in mountain regions in developing countries

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Adaptation to climate change impacts is a major challenge for the human society. For countries in development, consistent base lines of expected impacts at the regional scale are required to plan and implement low-cost adaptation measures that effectively address societal needs. However, donors and implementing agencies are often confronted with a lack of scientific data. This poses a serious problem to global adaptation funds, such as the one established under the UNFCCC, which are predominantly directed towards developing countries.
This contribution summarizes recent experiences gained from international projects in the Andes, by the Peruvian and Swiss Governments, and the World Bank, on the development of scientific base lines for selected regions in the Peruvian Andes. The focus is on the nexus between water resources, food security and natural disasters. The analysis shows that Peruvian Andes are among the most vulnerable regions to climate change. Negative impacts on water resources are expected from the rapid retreat of glaciers, extended and more frequent drought periods and increasing human needs. Climate change impacts are exacerbated by continued sub-optimal resource management. As a consequence of growing stresses, water availability for human consumption, agriculture and energy generation is increasingly limited. Assessment of the current conditions and reliable projections for the future are hampered by scarce data availability and methodological problems, such as downscaling of global and regional climate scenarios, cross-sector effects, and others. It is critical that related uncertainties, and the propagation thereof, are assessed throughout the impact analysis for an improved management of adaptation measures. Challenges furthermore include communication and understanding among different actors, including the scientific community, political and implementation agencies, and local population. Based on our experiences we will outline a good practice guidance document for developing scientific base lines, and discuss unsolved methodological challenges.