**Managing Risk Associated to Climate in the Higher Andes with the Integration of Local Knowledge and Technological Tools**

Many farmers’ ancient strategies to cope with Andean naturally highly variable climate (agro-biodiversity management, post harvest processing, wetland management for grazing, use of small irrigation schemes, observation of local indicators for efficient sowing and harvest times) are based on situations which are not longer available (permanent water discharge from glaciers, efficient knowledge transmission, efficient agro-biodiversity managed, etc) due to either physical or social reasons. In fact, many farmers have already changed their production systems to rapidly respond to the effects that temperature rising and erratic rainfall are producing. Young and/or innovative farmers are requesting agencies for more efficient tools that would help them to actually adapt efficiently and positively to the impacts of climate change in the Andes where the altitude and the previous limitations could make farmers, take advantage of the impacts of the changes in temperature and rainfall.

Although several initiatives are being developed to support farmer’s adaptation to climate change, the scientific bases for these actions are weak. Firstly, little has been evaluated within glacier dependant ecosystems from the scientific and technical point of view. Secondly the abrupt and largely heterogeneous local physiography makes extremely difficult the efforts on adequate forecasting if the local dynamics are unknown. Thirdly, the links between the factors influencing those productive ecosystems have not been settled, having isolated results for an extremely integrated and interdependent problem. Finally, there is a large tendency to underestimate the knowledge of Andean farmers of actions that they might take to efficiently react.

As such, the present proposal intends to develop a work based on a specific pilot high altitude watershed within the Bolivian Andes to address the following evaluation questions:

* What is the perception of Andean communities’ (is there a gender differentiation?) on climate and water availability change and how do these perceptions compare to changes noticed and predicted in scientific literature?
* Which meso, macro and microscale meteorological mechanisms have and the highest influence on the local micro-watersheds common in the Bolivian Andes?
* Which populations between and within families are most vulnerable to water reduction imposed by glaciers retreat? Why? What adaptation measures could reduce the vulnerability of those groups?
* How the recognition of local knowledge could be addressed to improve and optimize the early warning systes?
* What specific urgent and medium term actions, both technological and locally adapted are required to support farmers’ resilience to undependable water availability and what type of external factors might affect the success of those?