Climandes – User-tailored Climate Services for the Andean Region

The two national weather services SENAMHI Peru and MeteoSwiss initiated the Climandes project in 2012 to provide high-quality climate services and establish a user-dialog in order to meet the specific needs of Andean smallholder farmers. This is by no means an established field of action. Climandes was among the first projects to set up a pilot example under the newly established Global Framework for Climate Services GFCS, which recognized a whole new dimension of the role weather and climate services and user-dialogue can play. Ultimately, Climandes showcases a best-practice example of how such services can benefit climate-sensitive sectors and, hence, society at large.

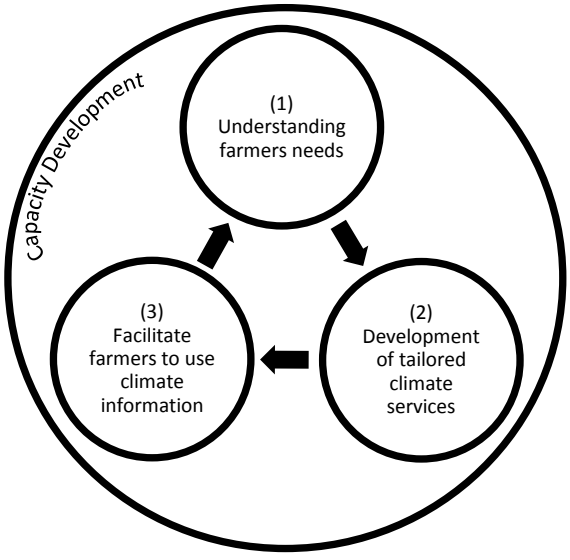
Climate services are key to increasing climate resilience of vulnerable populations

Small farming agriculture plays a key role in global food security and income source in rural areas. 500 million small farms produce up to 80 percent of the food consumed in developing countries. On the other hand, smallholder subsistence farmers in developing countries are disproportionately vulnerable to extreme weather events, which often leads to chronic food insecurity and precarious livelihoods (Harvey et al., 2014). Climate change may aggravate these problems (IPCC, 2014) and hinder global efforts for boosting poverty reduction, food security and the reduction of environmental liabilities, as stipulated in the Agenda 2030.

Although impacts of extreme weather events can be reduced by taking early action, many smallholder farmers often lack access to adequate timely weather and climate information about an upcoming event. In fact, during the 2016 El Niño event, a major part of the exposed vulnerable populations was uninformed and unprepared to the ensuing climate-related effects, although alerts were broadcasted (Frey et al. , 2016). Reasons for this include that the process of making climate information useful for end-users remains a considerable challenge due to existing cognitive, cultural, and institutional constraints. This holds true in particular for smallholder farmers in developing countries.

Project overview

Launched in January 2015, the second three-year phase of Climandes focuses on strengthening the dialogue between the national meteorological service SENAMHI and smallholder farmers in the Andean region of Peru. This is achieved through the training of professionals at SENAMHI to improve the development of climate services in concordance with the users' needs.



The general project overview can be portrayed as a feedback cycle process. The first step consists of understanding the farmers' needs for climate services by conducting a socio-economic vulnerability field study. In the next step, the obtained information is used for tailoring climate services to the identified needs, while in the third step, these products and services are provided to the farmers. The outreach to the farmers is accompanied by field schools that instruct farmers in the interpretation of the climate products and in the development of coping strategies given a certain climate information. The monitoring of the use and impact of these climate services in the pilot communities is essential, as it yields precious feedback for improvement. This includes establishing a de-facto partnership with Andean smallholder farmers, key end-users in the Climandes project. All these steps are accompanied by a broad range of capacity development activities to ensure that the know-how of SENAMHI and the involved partners is maintained, and that sustainable service chains are enabled.

Results

The successful results in the first two steps of the feedback cycle process were achieved through the following key outputs.

In terms of exposure and sensitivity, the socio-economic vulnerability assessment performed in the field in December 2016 revealed that frost is the biggest agro-climatic risk for the smallholder farmers of the highland pilot region of Puno, followed by drought and hail. We found that farmers receiving information on upcoming extreme weather and climate events showed significantly lower vulnerability towards these events than their counterparts. The most important distribution channel for weather and climate information are radio broadcasts. A good radio coverage in the region notwithstanding, smallholders showed a very limited understanding of the test set of such information broadcasted to them. This understanding is even more limited the lower the educational level. Particularly the understanding of the probabilistic nature of climate information is very low. This can be explained by the fact that smallholder farmers are not used to receiving weather forecasts provided with uncertainty levels. In terms of socio-economic vulnerability, poor smallholders with low education are significantly more vulnerable to extreme weather events. This translates directly into food security problems given their high subsistence rate (65% of the produced food is for own consumption). In addition, a strong wish for seasonal predictions was voiced by the farmers.

Based on these findings, the design of the envisaged climate services focuses on the development of specific indicators, such as plant specific frost days (e.g. for Quinoa, a very frost resistant plant that suffers from temperatures below -5°C after sowing (Romero, 2016)). Results show that the prediction of some temperature-based indicators for forecast ranges of up to seven months is reliable in the Southern Andean region. This predictability is likely to come mainly from the strong relation of air temperature to the phenomenon of the El Niño Southern Oscillation (ENSO). On the other hand, precipitation-based indicators such as the beginning of the rainy season cannot be predicted with sufficient skill at the seasonal scale. Forecast products based on precipitation, such as drought forecasts, are more valuable when used to highlight and raise the awareness of past climatic variability than as forecast information which directly would affect agricultural decisions. As part of the third step described above, the elaborated information will be discussed and taught in farmer field schools at the beginning of the coming agricultural season.

The above-mentioned capacity development is attained through the so-called twinning approach adopted by the project, i.e., the close collaboration between the weather services SENAMHI Peru and MeteoSwiss. All mentioned activities, such as the conduction of a field survey, the development of climate information, as well as the preparation and conduction of courses, are elaborated in collaboration between the partners and based on knowledge, tools, and products that already exist. This peer-to-peer collaboration has shown to be very effective and results in the transfer of ownership to SENAMHI, which proves progressive autonomy in managing various activities, while MeteoSwiss can more and more act in their advising role.

Short outlook

Typical project durations of the order of a few years are to be considered very short for the kinds of developments at hand. This is even more evident when taking into account that, for example, the Andean Region encompasses numerous countries with individual national weather services. Bearing in mind the benefit of covering the entire Andean Region, it would be mandatory that future activities include some sort of multiplicative factor for capacity and product development. Through Climandes, SENAMHI Peru has acquired significant expertise in key areas for the supply of climate services and is now in position to take on a leadership role in the region. Therefore, a future engagement will likely be based on a strong partnership between MeteoSwiss and SENAHMI.

Project Set-up

The Climandes project was initiated by the two national weather services MeteoSwiss and SENAMHI Peru and supported by selected Swiss and Peruvian partners from the academia and the private sector under the umbrella of the WMO-led Global Framework for Climate Services. It is an initiative of the Global Programme Climate Change and Environment of the Swiss Agency for Development and Cooperation.

References

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