Farmer Gualberto in foreground discusses Weather Underground forecast with project PI Edwin Yucra. Photography: Claire Nicklin

Summary: The overall goal of this project is to establish and evaluate an integrated climate planning tool based on local knowledge and scientific knowledge to help farmers make agricultural planning decisions based on improved forecasting tools used to predict short and medium term meteorological conditions.

For more information see:
www.ccrp.org/grants/frn-early-climate-warning-ii/

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Comunidad de Práctica
Los Andes

Bolivia

- -

Socios del Proyecto

Socios del proyecto

UMSA

8 comunidades

■ Universidad de la Región   ■ Organización de Agricultores
■ Universidad fuera de la Región

COLLABORATIVE CROP RESEARCH PROGRAM

McKNIGHT FOUNDATION

Research to Impacts Map: **Farmer Research Networks (FRN)**
Early Climate Warning 2009-2017

Network data sets that reveal useful productivity patterns

Trends in climate change in the Bolivian Altiplano were outlined using published research on historic temperatures (1955-2004) from meteorological stations, combined with local perceptions:

- In general there are warming trends in **minimum and maximum temperatures.**
- While there isn't a significant change in total annual precipitation over time, the warming temperature led to more **evapotranspiration**, which results in drier conditions and less water availability.
- Models based on these data show that **between** 2020-2030 there will be more frost-free periods, and precipitation extremes will continue.

Data set analysis provides greater understanding of options x contexts

A study based on survey data collected in **2006** of 340 representative families across 11 communities in the Bolivian Altiplano shows that:

- **Traditional practices** to face climate variability are being abandoned. Specifically, only 10% in one community and 40% in another are still using bioindicators to forecast climate, **down from nearly 100% 10 years ago.**
- The **number of native potato varieties** is also declining, due to the introduction of an improved variety which has multiple culinary uses, a high price, high yields with chemical fertilizers, and requires less labor. 90% of farmers are using this variety now.

The abandonment of these practices might be due to:

- **A formal education system** that bypasses traditional parent-child learning.
- Access to **tractors** which separates sowing and manure application activities, and makes sowing time dependent on when the community tractor is available.
- **More off-farm work** (possibly spurred by smaller plot sizes) which reduces labor availability.

It is often thought that only the oldest, most uneducated and poorest farmers (laggards) use traditional practices. Actually:

- **The poorest and the wealthiest** farmers use traditional practices.
- **The wealthiest** also use modern technologies, combining chemical and manure fertilizers, and improved and traditional varieties.
- The farmers **in the middle** have neither the money or the labor to use traditional practices, and therefore, when they have the money they tend to use it **to purchase inputs.**

Collaborations between all sectors

2016-2017: The project has **8 weather stations** set up in different communities and connected to a **Weather Underground app**, so that local farmers can get short term forecasts based on their meteorological station. This can help with issues such us knowing:

- When **to plant** (looking for a rainy day and a new moon).
- When there might be **lightning** (major risk for people, mostly pastoralist women, and for livestock).
- When to **cover** a recent harvest that is **getting dry.**

Farmers also use **bioindicators for long term** forecasts (more than 2 weeks).

Local stations are also feeding a **database** managed by the national meteorological agency, SENAHMI, and by a climate monitoring network based at Princeton University, which is **generating models** to better understand how global and regional phenomena affect local weather patterns, and triangulating with bioindicators, in the hope of **creating more refined forecasts** in the future.