

# Climate KASAP

# Hypotheses

- Changes in climate have a negative impact on cropping systems. Cropping systems are changing in the face of climate risk.
- Local perceptions of climate conditions reflect the trends identified in the climatology.
  - Local perceptions of climate affect behavior.
- Climate hazards are the most significant risk facing households.
- Traditional forecasts methods are unable to predict current climate behavior.
- The combination of local and scientific knowledge of climate can help farmers make decisions that increase resilience.

# Hypotheses

- Changes in climate have a negative impact on cropping systems. Cropping systems are changing in the face of climate risk.
- Observed temperature and precipitation in the Altiplano demonstrate clear trends over the last 40 years.
- Present day precipitation variability in the Altiplano is related to conditions in the tropical Pacific Ocean and variations in the Bolivian high.
- Climate models used in the IPCC assessment represent current climate and its variability.

# Hypotheses

- Local perceptions of climate conditions reflect the trends identified in the climatology.
  - Perceptions affect behavior.
- [need to complete analysis of survey data for perceptions]

# Hypotheses

- Traditional forecasts methods are able to predict current climate behavior.
- [need to select indicators for evaluation]

# Hypotheses

- Climate hazards are the most significant risk facing households.
- [with Elizabeth, Lisa and MU]
- [identify observed drought, floods, frost from the station data]

# Hypotheses

- The combination of local and scientific knowledge of climate can help farmers make decisions that increase resilience [or reduced vulnerability?].
- [Collab: are there alternatives available to farmers to reduce risk?]
- Changes in climate in the 21st century will have substantial impacts on cropping conditions Altiplano.

# Yr 2 Scientific Products

## in collaboration with other groups

- Documenting observed climatology and trends in the Bolivian Altiplano, [JCL, IJC, CC]
  - analysis of station data, evaluation of global datasets
  - [Magali, Edwin, Anji, Jeanne, other?]
- Climate Projections for the Bolivian Altiplano: changes in mean and variability [GRL]
  - analysis of climate models, reanalyses, stations, CRU, CMAP
  - [Anji, Jeanne, Magali, other?]
- Farmer perceptions and observed climatology in the Bolivian Altiplano [Society and Natural Resources, CC, Mountain Research & Development]
  - analysis of focus groups, PRA, and station observations
  - [Jere, Edwin, Magali, Diana, other?]
- Perceptions of changes in climate and pests in the Bolivian and Peruvian Altiplano Communities [Society and Natural Resources, CC, Mountain Research & Development]
  - analysis of baseline survey plus focus groups
  - [Cecilia, Jan, Pedro, Jere, Edwin, Magali, Clovis, Diana, other?]

# Yr 2 Products for Development

in collaboration with other groups

- Handbook outlining literature and approach? Have Swiss done this?
- Climatology and maps of Altiplano to discuss with farmers. Participatory Workshops [Edwin? How to do this?]
- Presentation of preliminary analysis to decision makers? [in Bolivia? At USAID?]
- Technical report on climate indicators.[on web?]
- Technical report on climatology.[on web?]

# Science Products Yrs 3&4

## Integrated (Jeanne's PhD Thesis)

- The Bolivian high and Altiplano precipitation: present and future.[J. of Climate]
  - analysis of station data, evaluation of global datasets, models (monthly)
  - [Jeanne, Anji, Magali?, SENAMHI?, other?]
- Changing character of warm season precipitation in the Altiplano. [J. Geophysical Research]
  - analysis of station data, evaluation of global datasets, models (daily)
  - [Jeanne, Anji, Magali?, SENAMHI?, other?]
- Projected changes in frost and heatwave frequencies in the Altiplano. [J. Climate, CC?]
  - analysis of station data, evaluation of global datasets, models (daily)
  - [Jeanne, Anji, Magali?, SENAMHI?, other?]
- Changing character of agricultural drought in the Altiplano.[J. Climate, CC?]
  - analysis of station data, evaluation of global datasets, models (daily)
  - [Jeanne, Anji, Magali?, SENAMHI?, other?]

# Science Products Yrs 3&4

## Integrated

- Downscaling climate change projections for the Altiplano.[J. of ??]
  - using Multi-Fractal methods and wavelet analysis, and station data, global datasets, models.
  - evaluation of method (monthly)
  - [Adolfo, Roberto, Anji, Magali?, Jeanne?, other?]
- Downscaled frost and drought frequencies for the Altiplano. [J. of ??]
  - analysis of station data, evaluation of global datasets, models
  - evaluation of method (daily)
  - [Adolfo, Roberto, Anji, Magali?, Jeanne?, other?]
- Response of (Late Blight) to changing climate in the Altiplano. [J. Pest??]
  - station data, evaluation of global datasets, models (daily or 6hrly)
  - [Karen, CIP, Anji, Magali?, SENAMHI?, other?]
- Changes in Climate and Markets in the Altiplano.[Climatic Change]
  - Markets, Climate
  - [Corinne, Elizabeth, Anji, Magali, other?]
- Biophysical Approach to the analysis of local seasonal indicators in the Bolivian Altpilano. [J. Arid Environments, J. Ag For. Meteo., Mountain Research?]
  - local indicators versus observations for the season
  - [Edwin, Magali, Jere, Anji, other?]

# Science Products Yrs 3&4

## Integrated

- Local dynamics of precipitation and frost in the Lake Titicaca region of the Bolivian Altiplano. [Mountain Research]
  - using weather station in Ancoraimes.
  - [Magali?, Peter?, Anji?, other?]

# Development Products Yrs 3&4

## Integrated

- How do we measure impacts?
- Spanish or local language handbook for education (schools, farmer groups) on indigenous knowledge of climate indicators. [Edwin and Jere and Diana]
- Presentation of integrated climatic analysis to decision makers? [in Bolivia? At USAID?]
- Understanding changes in the agricultural environment of the Altiplano.[Handbook?]

# Yr 2&3 Work Plan

- Feedback workshop for communities?
- Perform analysis of monthly and daily climate (model and observations)
- Analysis of farmer's perceptions of changes in climate and pests
- Write and submit year 2(&3?) science publications
- Present results at meetings
- Identifying patterns of climate risk perceptions among the communities and link them to patterns of livelihood strategies