Adapting to Change in Andean Ecosystems Climate and Strategies

LTRA4

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Overview

- About SANREM CRSP LTRA 4
  - Research Design, Landscapes and Approaches
- Bridging Climate Knowledge Systems
  - Climate Trends, Projections, Landscapes
  - Perceptions & Local Knowledge
  - Advocacy coalitions
- Next Steps

SANREM CRSP LTRA 4

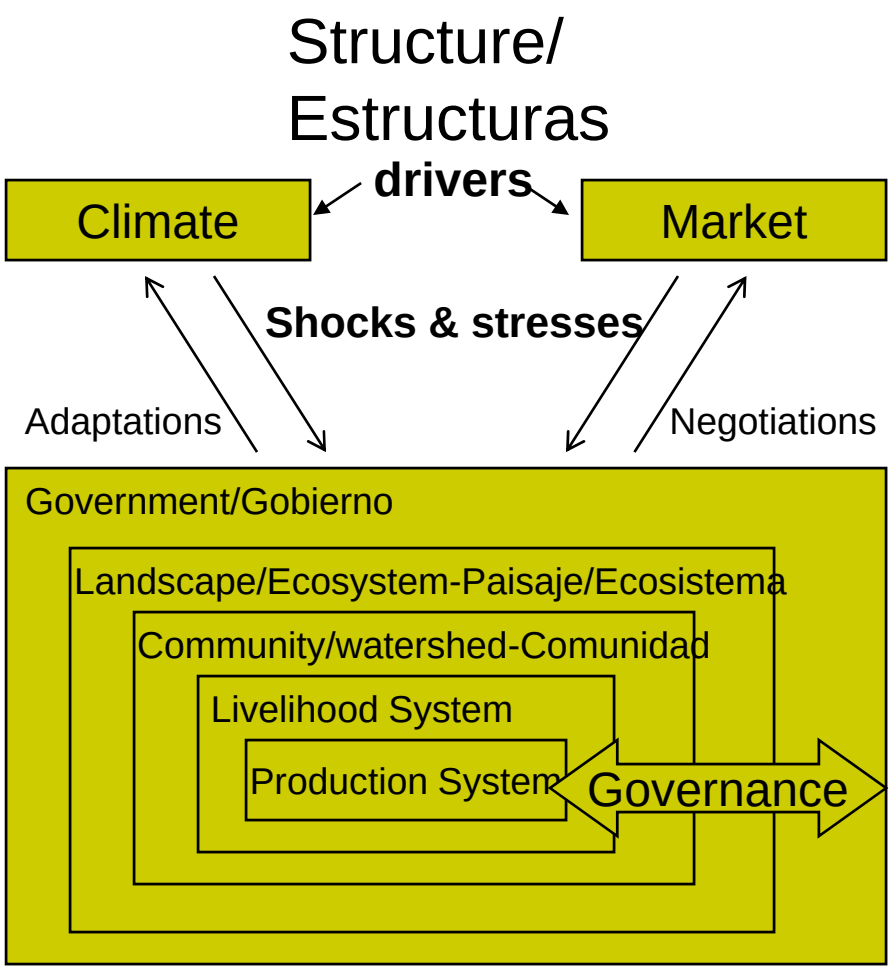
CLIMATE & MARKET DRIVERS & ECOSYSTEM DYNAMICS

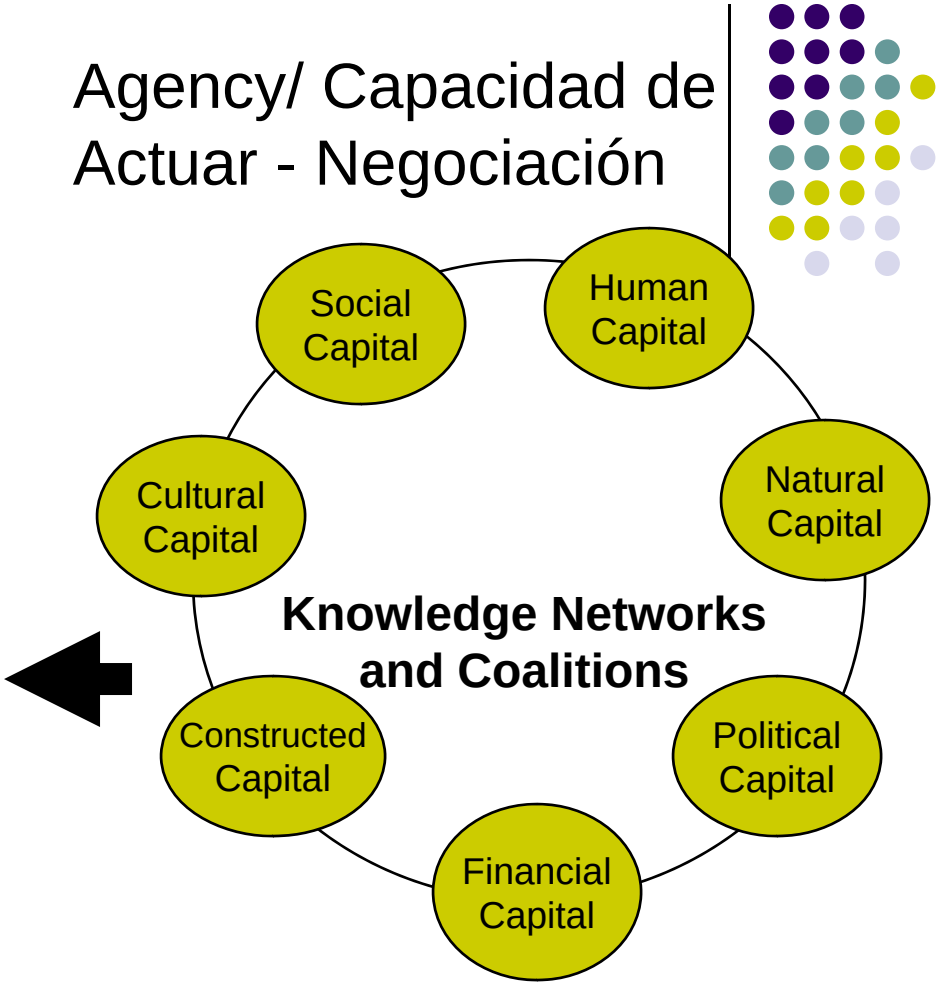
CAPACITIES & CAPABILITIES ABILITY TO ACT

LOCAL KNOWLEDGE PERCEPTIONS RISKS

BRIDGING KNOWLEDGE FOR MARKET ACCESS STRATEGIES

KNOWLEDGE BRIDGING PRACTICES & INFORMATION





Hypotheses on the current state and its drivers

Pests	Local Climate
Soils	Local Markets
Biodiversity	Livelihoods

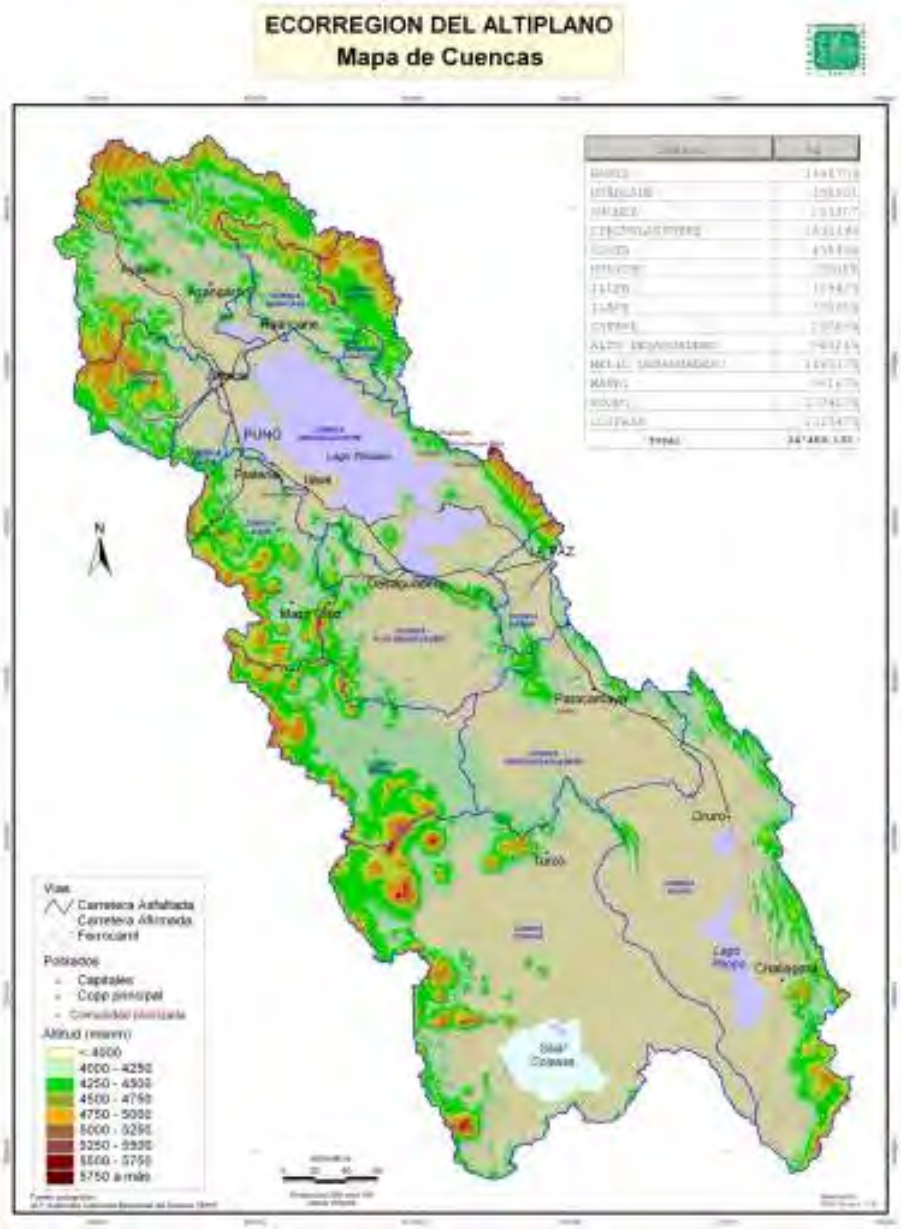
Transformative Hypotheses

Bridging knowledge systems for change
Building coalitions to implement change
Risk and dread and ability to act

Adapting to Change in the Andean Highlands

- Link local and new knowledge for adaptation in rural communities
- Identify which mechanisms (approaches, methods, activities, “institutions”) allow for the new information to lead to action
- Build capacities through Advocacy Coalitions, Participatory Research and Training
- Assess and facilitate processes that lead to action (implementation of knowledge) and build linkages with other instances of government

Study Sites



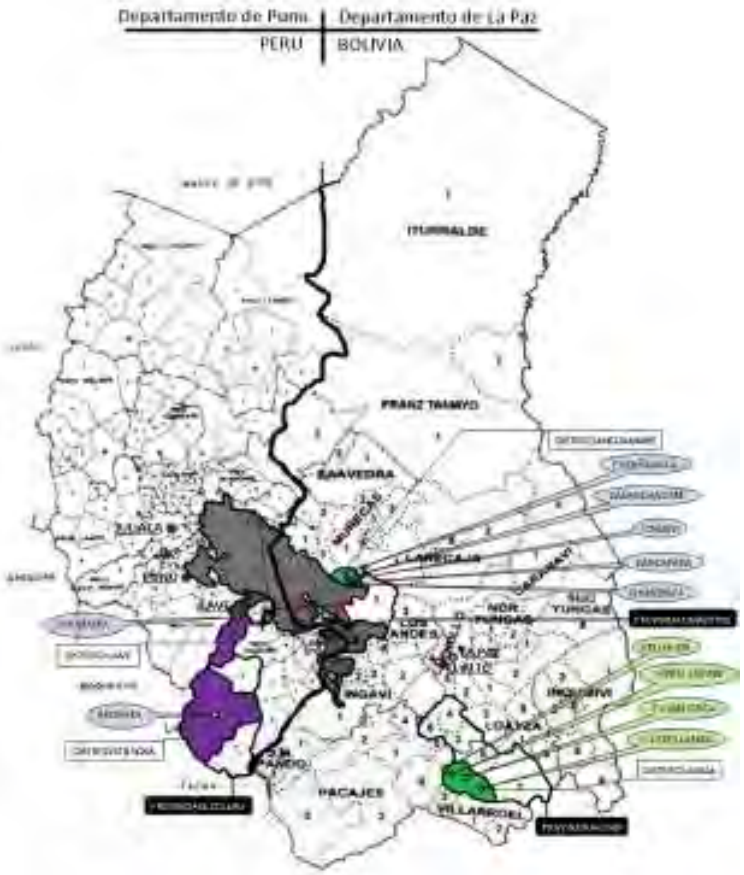
Bolivia:

Northern Altiplano

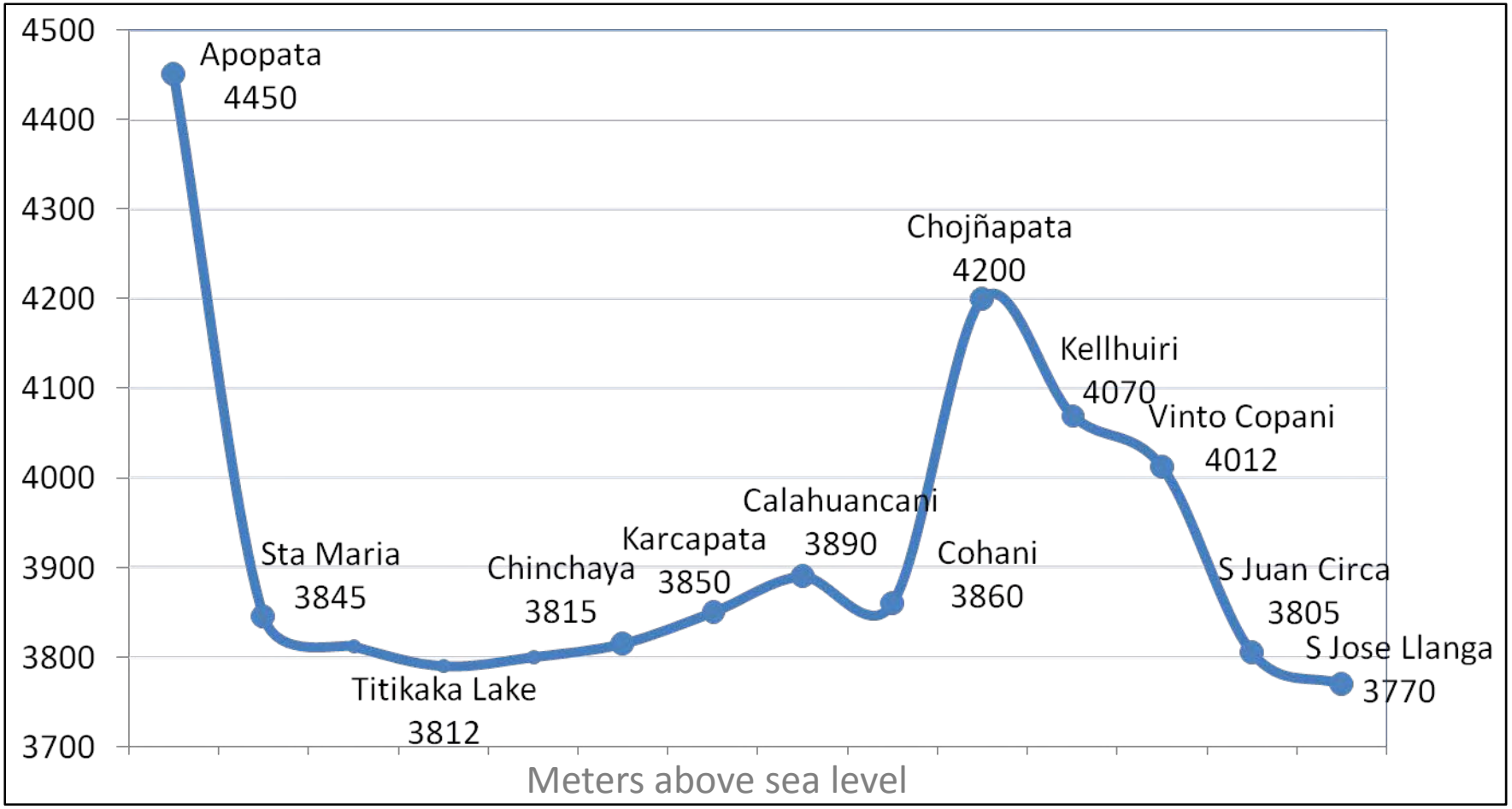
Central Altiplano

Peru:

Southern Altiplano

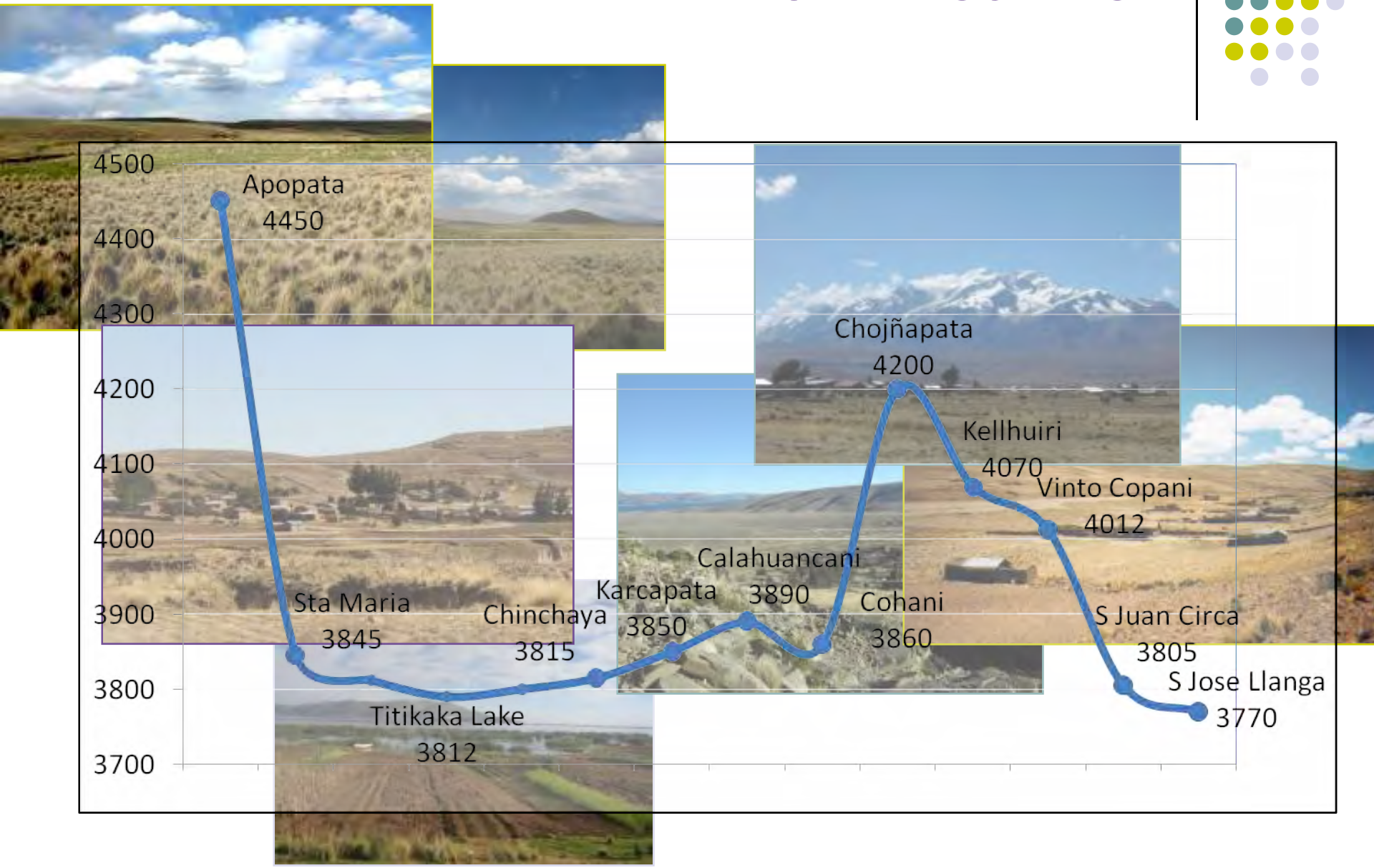


DISTRIBUTION OF SANREM CRSP ALTIPLANO COMMUNITIES RESEARCH SITES BY ALTITUTE

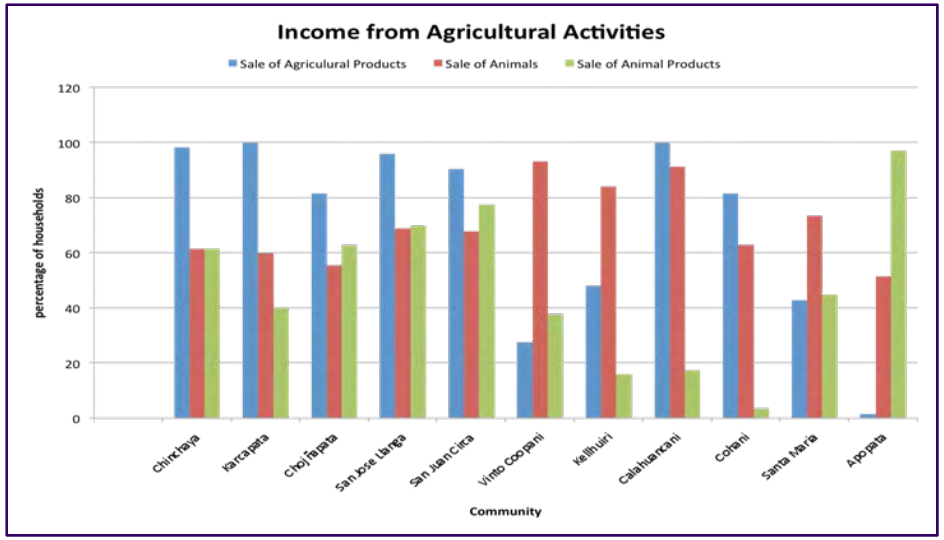


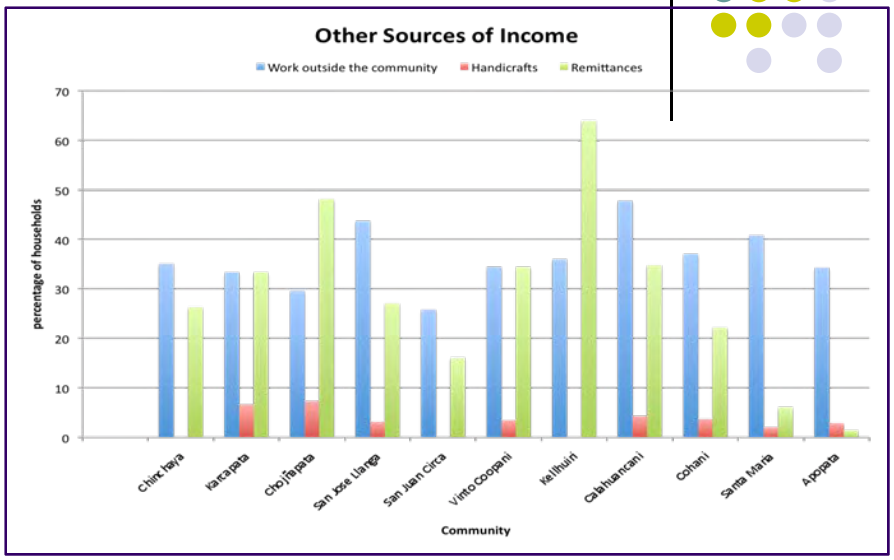
Source: Turin Canchaya, C.

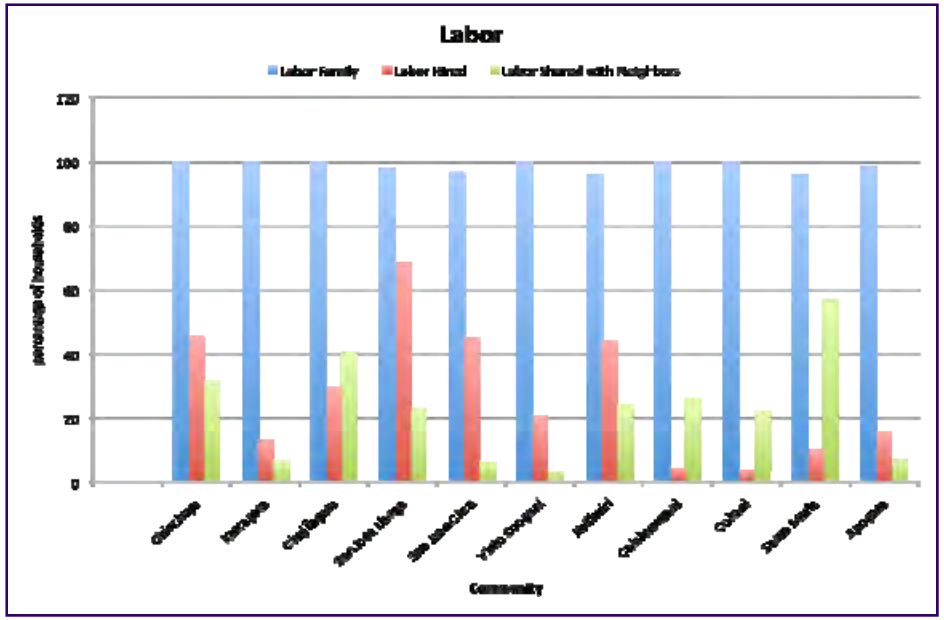
ALTIPLANO LANDSCAPES

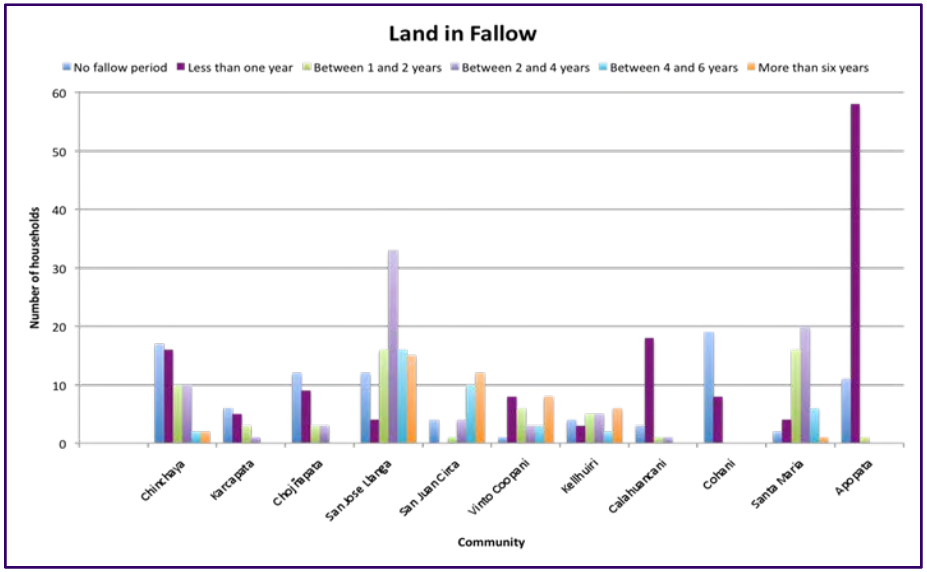


Altiplano Ecosystems: Community Capitals, Activities and Livelihoods Across Research Sites







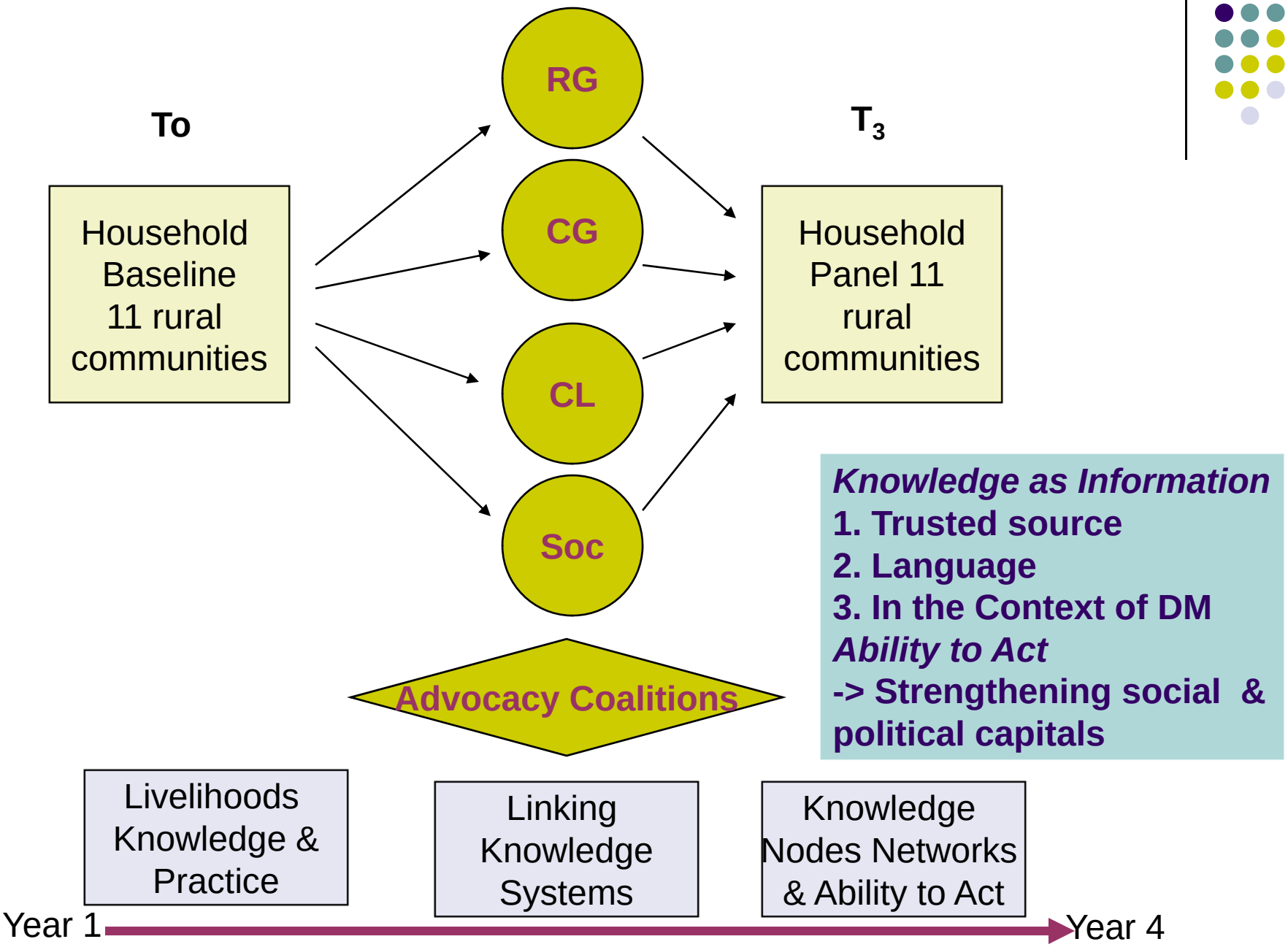


Turin and Thomas, 2008

An Integrated Plan of Participatory Research and Impact Evaluation

a. To identify concerns, demands, perceptions, risks, and vulnerabilities;
b. b. To conduct research;
c. c. To share findings (*socialización*)

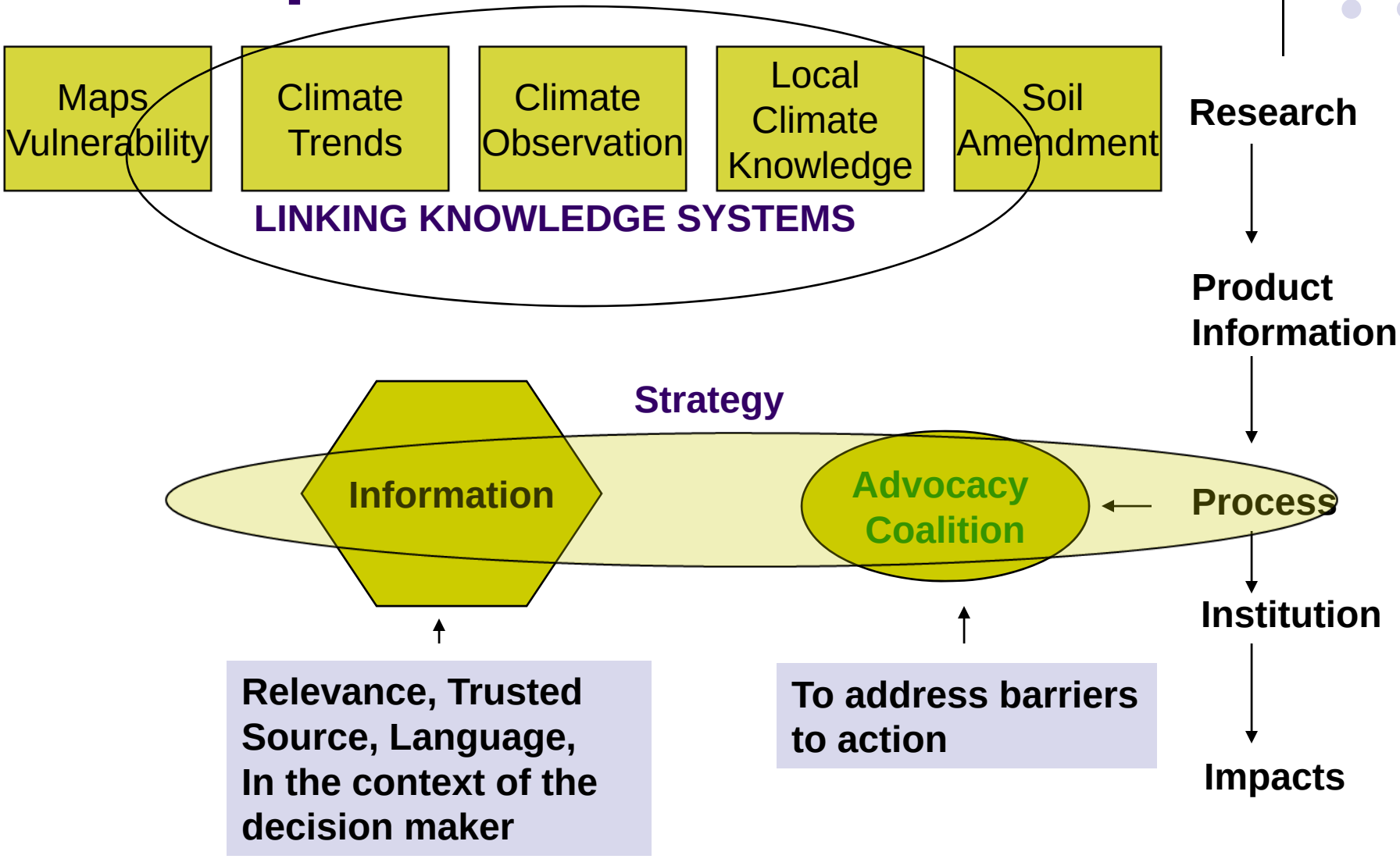
LTRA4 Altiplano Ecosystems Knowledge to Action Design



Integrating knowledge systems

Climate

Example – Climate



Practices and Information – Climate Highlights (Yr 3)

I. Projected Changes in Annual Cycle Altiplano

- Temperature:
  - 1.5 - 2 C increase in mean by 2030
  - 4-5 C increases by end of century
- Precipitation:
  - possible small decrease in SON
  - significant increase in DJFMA
- Both changes are larger and significant by end of century

- Seth, Garcia, Thibeault, 2008, manuscript submission

Practices and Information – Climate Extreme Events Highlights

II. Projected Changes in Extreme Events

- Temperature extremes are consistent with warmer temperatures (increases in Warm Nights, Heat Waves*, Extreme Temperature Range, and decrease in Frost Days**)

- Precipitation extremes suggest redistribution with more precipitation in fewer rainy days (increases in Dry Days, Max 5 day, Simple Intensity, and Heavy precipitation) - in accordance with station data from Patacamaya.

new calculation will be developed using percentile rather than threshold

****not reliable due to warm bias and low elevation in the models***

- Thibeault, Seth, Garcia, 2008, GRL, in preparation

Puno, 2008

Practices and Information – Local Knowledge & Climate Trends

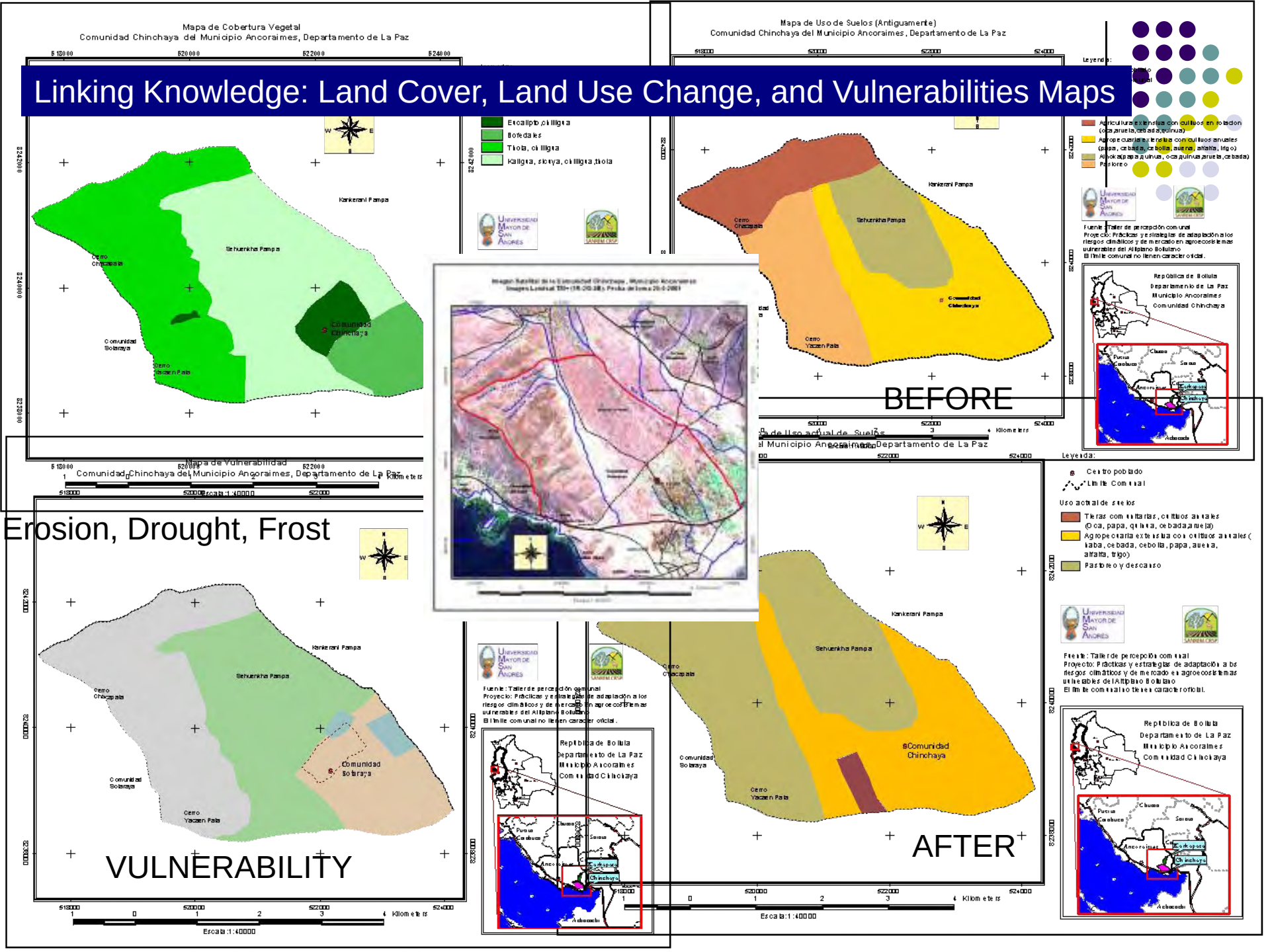
III. Farmer perceptions and observation of trends

- Perceptions of declining rainfall are inconsistent with observations
- But can be explained by observed trends in precipitation intensity from Patacamaya, observed increases in evapotranspiration, and are consistent with model projections analyzed for the Altiplano

- Gilles, Yucra, Garcia, 2008, MRD, in preparation

Puno, 2008

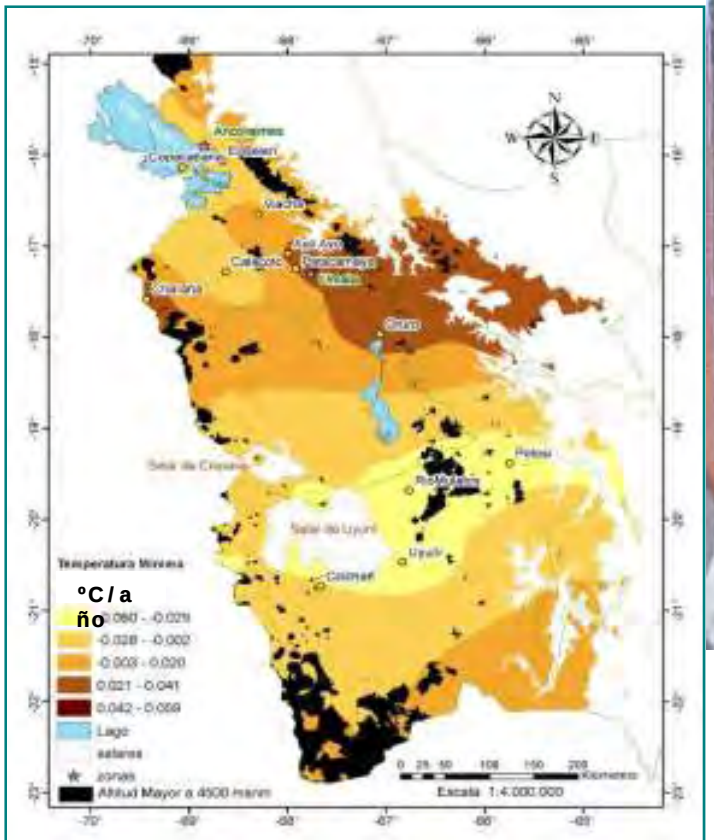
Linking Knowledge: Land Cover, Land Use Change, and Vulnerabilities Maps



Changes in Landscapes

- Before

- Changes in climate

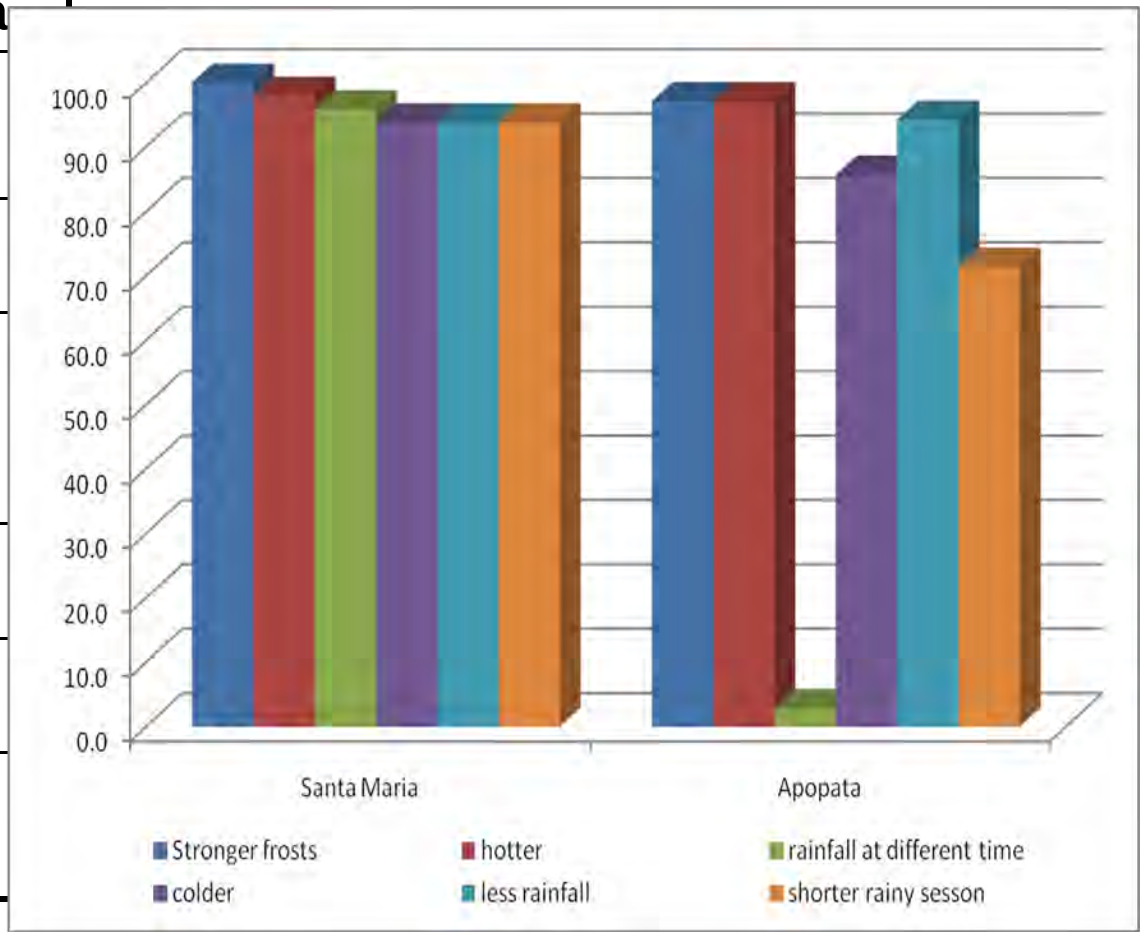


- Today

Motavalli et al 2008

Perceptions of Climate Changes in Puno
Contrasts between sites

Changes in Climate %	Santa Maria	Apo-pata
Stronger Frosts	100	97
Warmer	98	97
Rainfall Timing Change	96	3
Colder	94	86
Less rainfall	94	94
Shorter rainy season	94	71



Perception of risks are high

Climate Risks (1 = no risk; 5 = high risk)					
Clusters	CC	Hail	Frost	Drought	Floods
I	3.75	3.8	3.8	3.6	3.9
II	4.08	3.7	3.9	3.9	3.9
III	3.9	3.7	3.9	3.70	4.08

	Market Risks		Pests
	Crop Prices	Livestock Prices	
I	3.63	4.13	3. 5
II	3.85	3.95	3.95
III	3.89	3.93	3.86

(Valdivia et al, 2007. Ancoraimes site, survey 2006)

Practices and Information – Climate Perceptions and Shocks

0. Experiences with and Perceptions of Climate Hazards and Risks
   - High Proportion of the Population Impacted by Climate Hazards
   - Perceptions of risk vary by place portfolio and wealth
   - Risk perception of climate and pests > markets; but all are high
   - Both changes are larger and significant by end of century

- Valdivia, Jimenez Marks and Romero, 2007

Advocacy Coalitions (AC)

- ✓ Support participatory and inclusive bottom-up approach that helps organizations increase their capacities to form alliances and examine different negotiation scenarios.
- ✓ Agency
- ✓ Highlights of work done with AC:
  - ✓ In the community of Apopata, Peru
  - ✓ Training in Bolivia
- ✓ Themes:
  - ✓ **Knowledge to Action (K2A) with Markets**
  - ✓ **K2A Climate Adaptation**

Adapting… On-going

- Facilitating a working group on Climate Change and Adaptation
- Another year of data – soils pests plants + HH Survey
- Landscape research in Apoapata – bofedales- and Santa María – planning; continue Ancoraimes
- Advocacy coalitions for market integration strategies that increase market negotiation – leading UNALM in the effort across countries
- Soils and pest dynamics research initiated in Santa María – knowledge sharing with Bolivian investigators and farmers
- Training and co-learning activities continue
- Engaging the adaptation and climate community - Altiplano
- Assessment of changes in knowledge, attitudes, practice and aspirations across sites
- Impact enhancement grants SANREM CRSP

Building Capacities: Degree and Non Degree Training*

- **<u>Non degree:</u>**
  - Training of researchers: **11 events**
  - Training of farmers: 30 **events**
  - Stakeholder seminars: 4 events
- **<u>Degree training</u>**: 41 **students**
  - **15 *Licenciatura***
  - **21 MS**
  - **5 PhD**
  - **MS Program UNALM**
  - **CIDES Doctoral Course**

*** (Year 3 Progress Report)**

Questions …

Acknowledgments

Title XII USAID Collaborative Research Support Programs

Virginia Tech – Management Entity of the Sustainable Agriculture and Natural Resource Management CRSP

University of Missouri ; University of Connecticut; Kansas State University – 25%+ matching

Five collaborating institutions; in Peru the National Agrarian University La Molina UNALM and the International Potato Center

11 rural communities in the Altiplano of Peru and Bolivia

USAID FROM THE AMERICAN PEOPLE

SANREM CRSP

DÍA DE CAMPO
VINTO COCOPANI
MUNICIPIO DE OICALA

Bridging Knowledge

SOCIALIZACION

SUELO

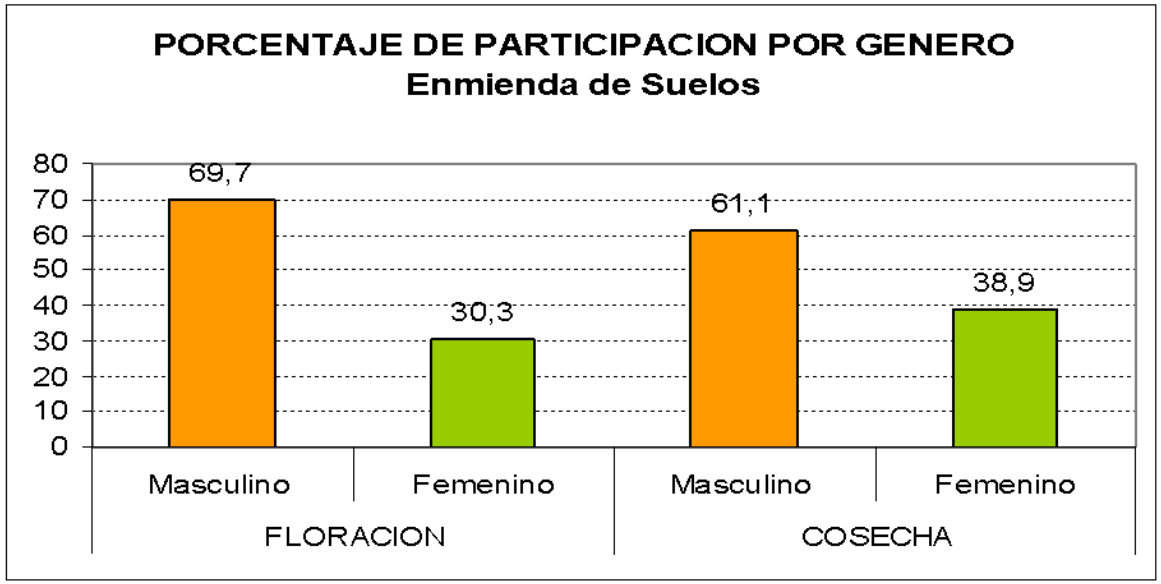
BIODIVERSIDAD

PLAGAS

CLIMA

Yucra and Yana 2008

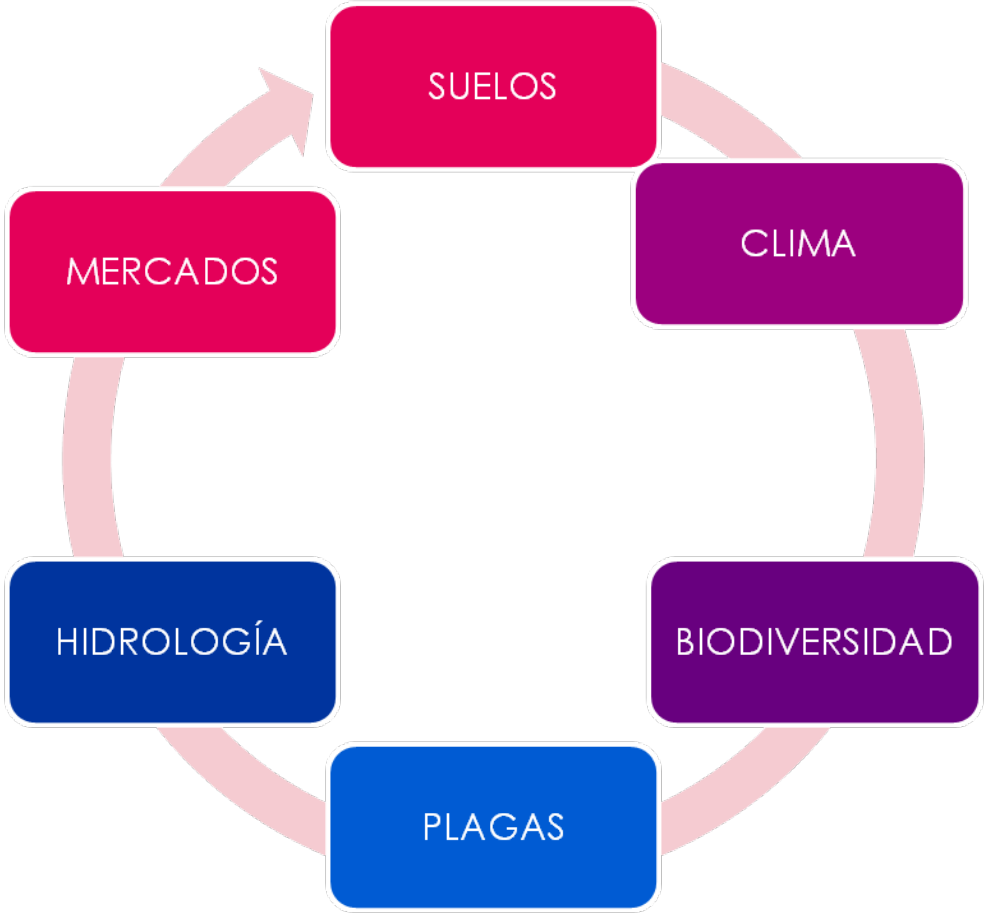
Research on Institutions of Participation



Research on Diffusion of Information and Ability to Act: Household Surveys linked with data on participatory research groups – Track networks and use of information

Landscape Research

Year 3 and 4 Ancoraimes
Year 4 in Santa Maria and Apopata, Ilave



Ancoraimes Watershed, Cusicanqui et al 2008