Perth III: Mountains of Our Future Earth

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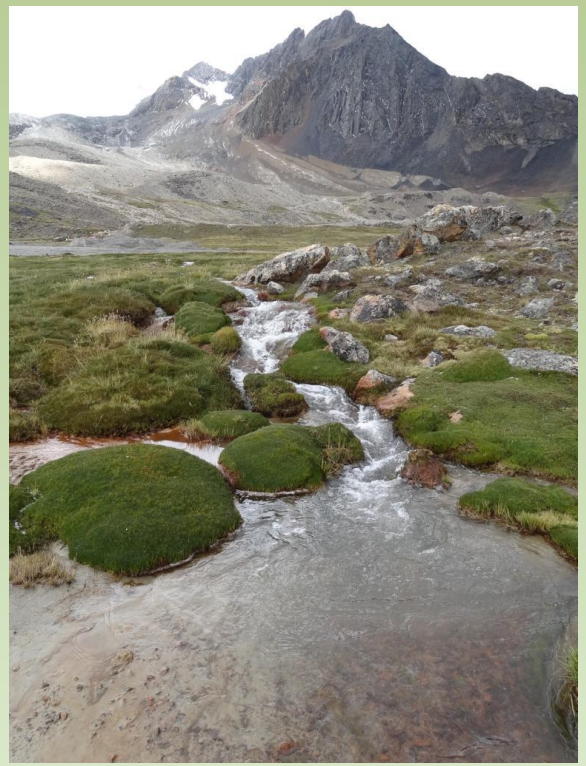
4-8 October 2015

Characterization of the dynamics of communal management of high Andean wetlands (*bofedales*) in the Bolivian Cordillera Real

Dirk Hoffmann, Bolivian Mountain Insitute - BMI

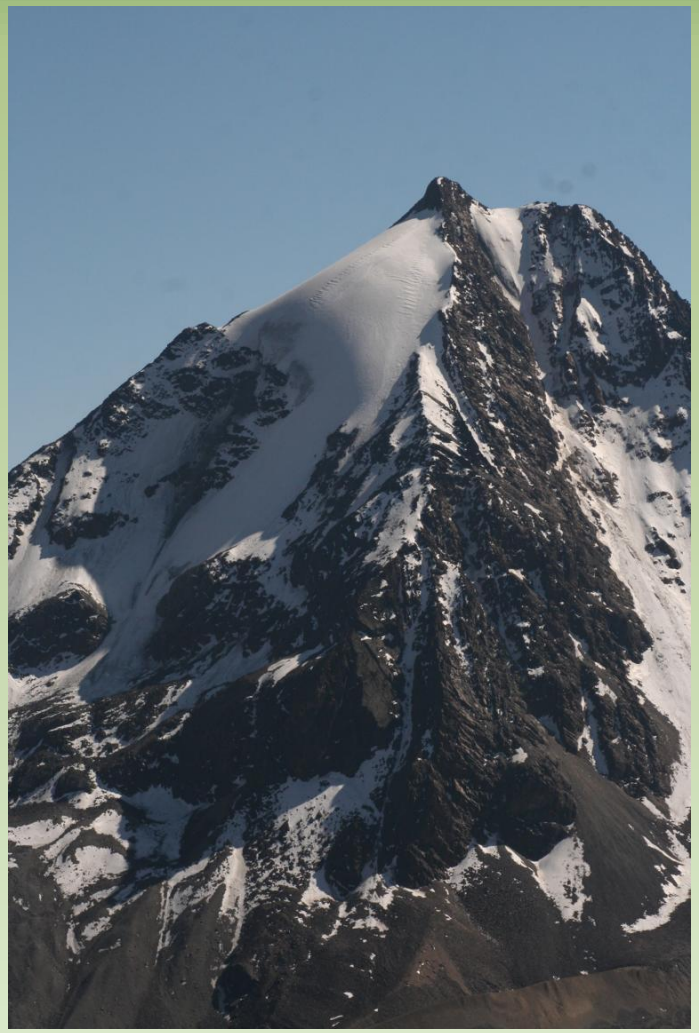
Accelerated melting of Bolivia´s glaciers

- Bolivian **glaciers have lost about half** their area and volume during the past 50 years (Soruco *et al.* 2009).
- This trend is **accelerating** and has profound impacts on high Andean livelihoods.



Impacts of glacier recession on Andean communities

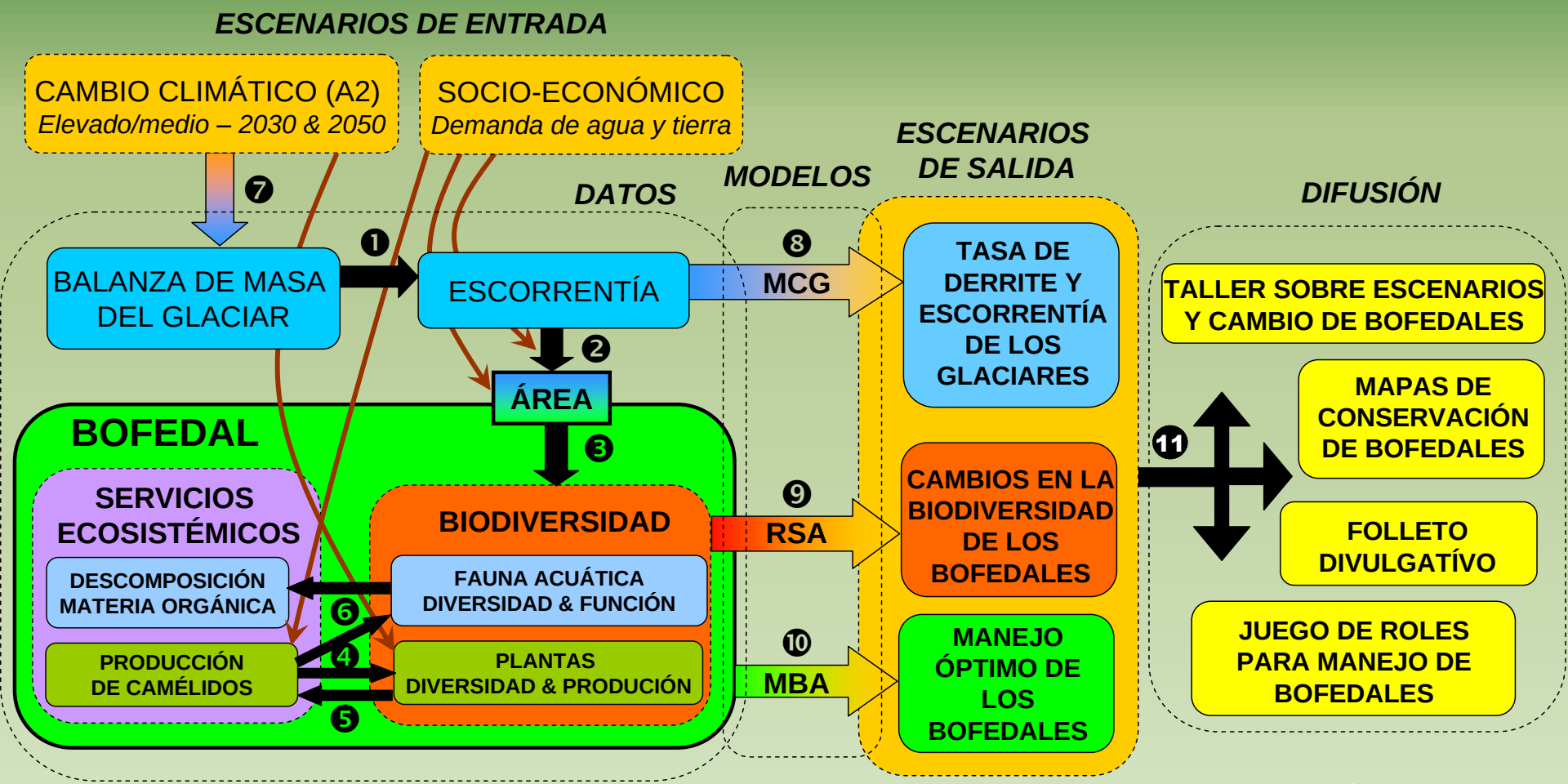
- Changes in **water availability**:
  - Especially relevant during dry season
  - At first there is an increase, followed by rapid decline
- Change in **landscape** / disappearance of the „white ponchos“



How do Andean communities cope?

- Case study Tuni-Condoriri region, Cordillera Real
- Part of the Bio-THAW project (www.biothaw.ird.fr)
  BIOdiversity in **T**ropical **H**igh **A**ndean **W**etlands

General framework for the Bio-THAW Project



Source: Olivier Dangles

Bio-THAW Project


animales


animales


plantas


plantas


vacas


pesca/caza?


temperatura


glaciares


agua

ECOLOGIA

HYDROLOGIA

AGRONOMIA

Cambio climatico

?

? gobierno

? Instituciones locales

leyes ?

? agricultores

? mineros?

?

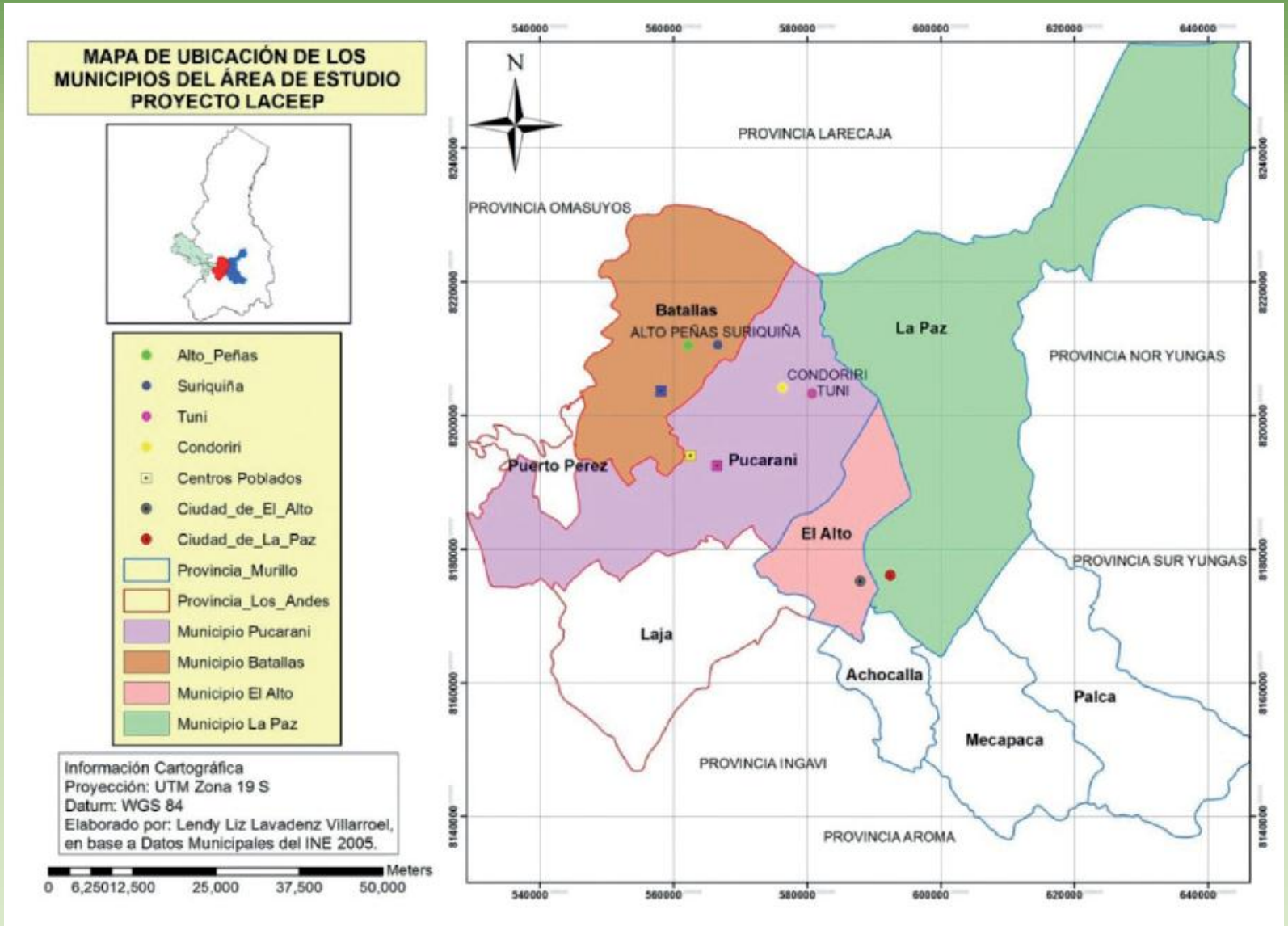
Decisiones ?

Percepción ?

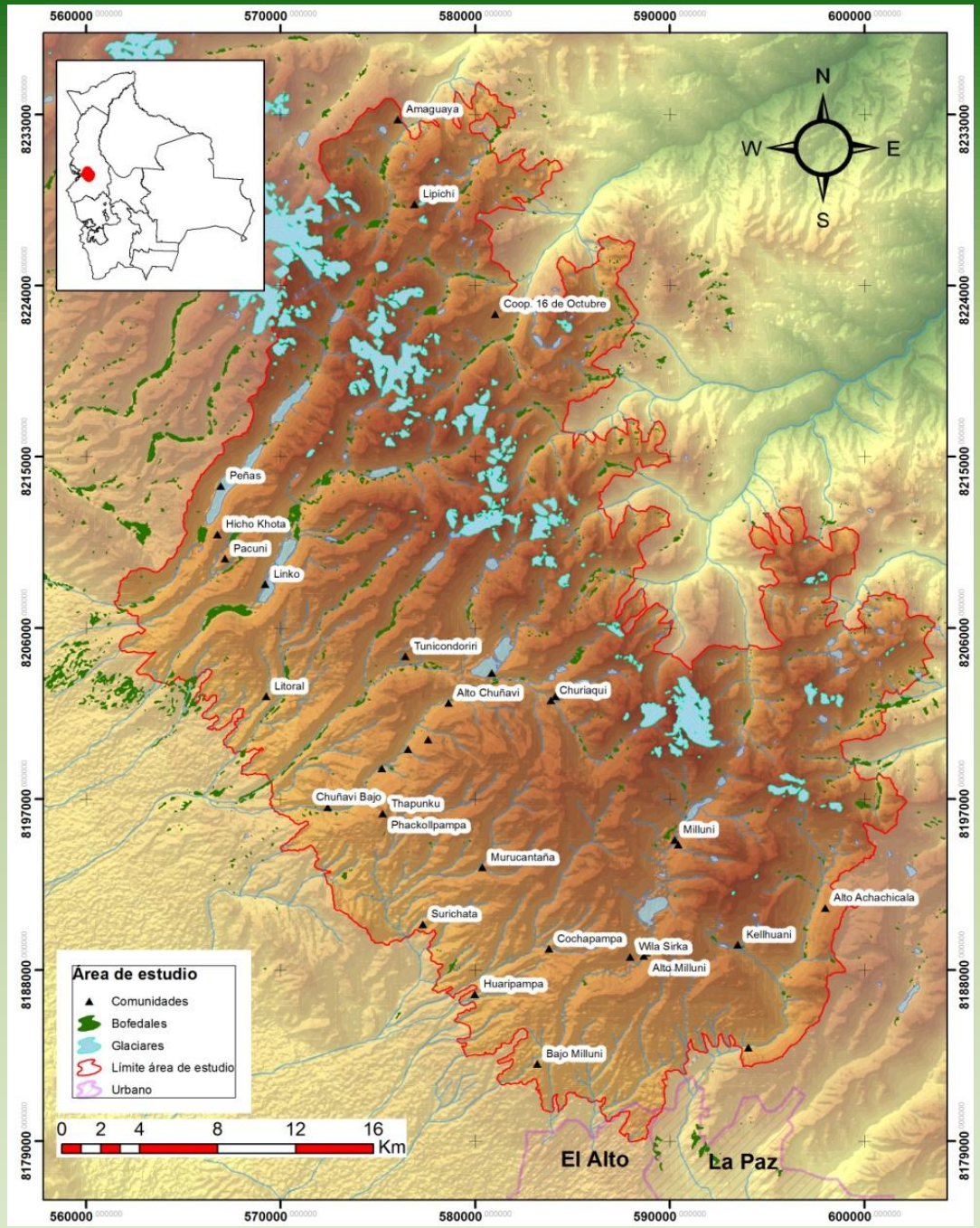
Mapa socio-político, sistema de gobernaría (hay tramposos?)

Source: Olivier Dangles

Political map of study area

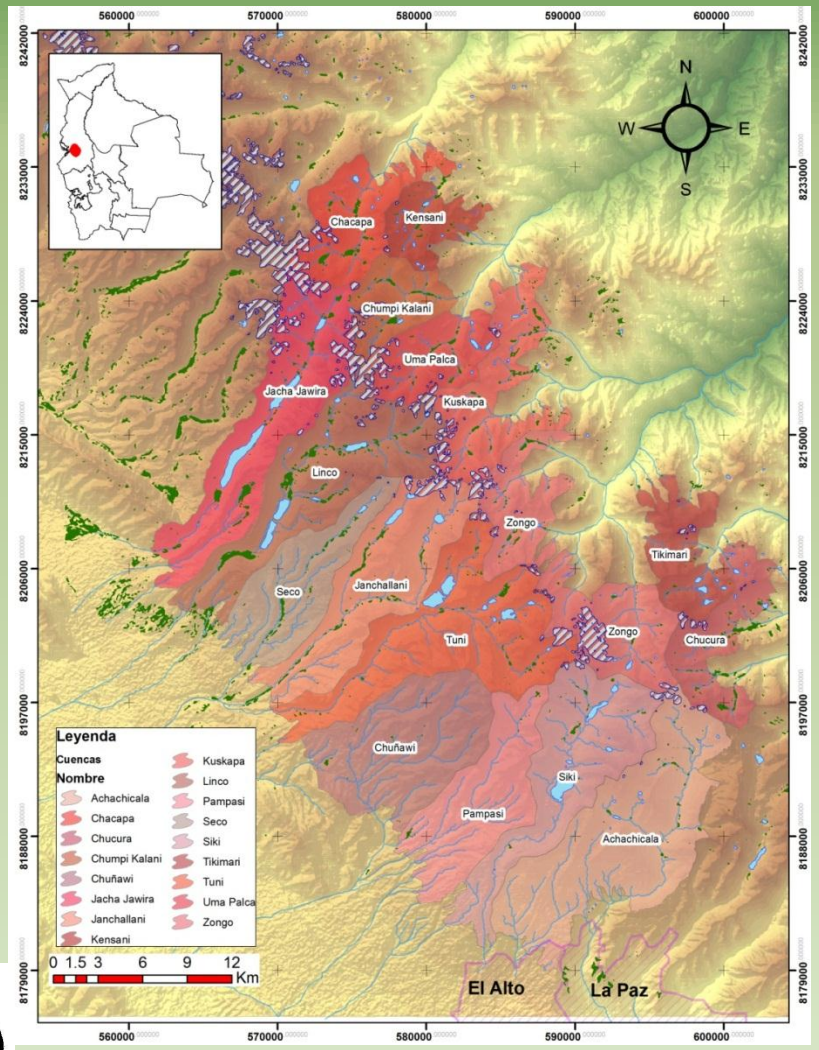


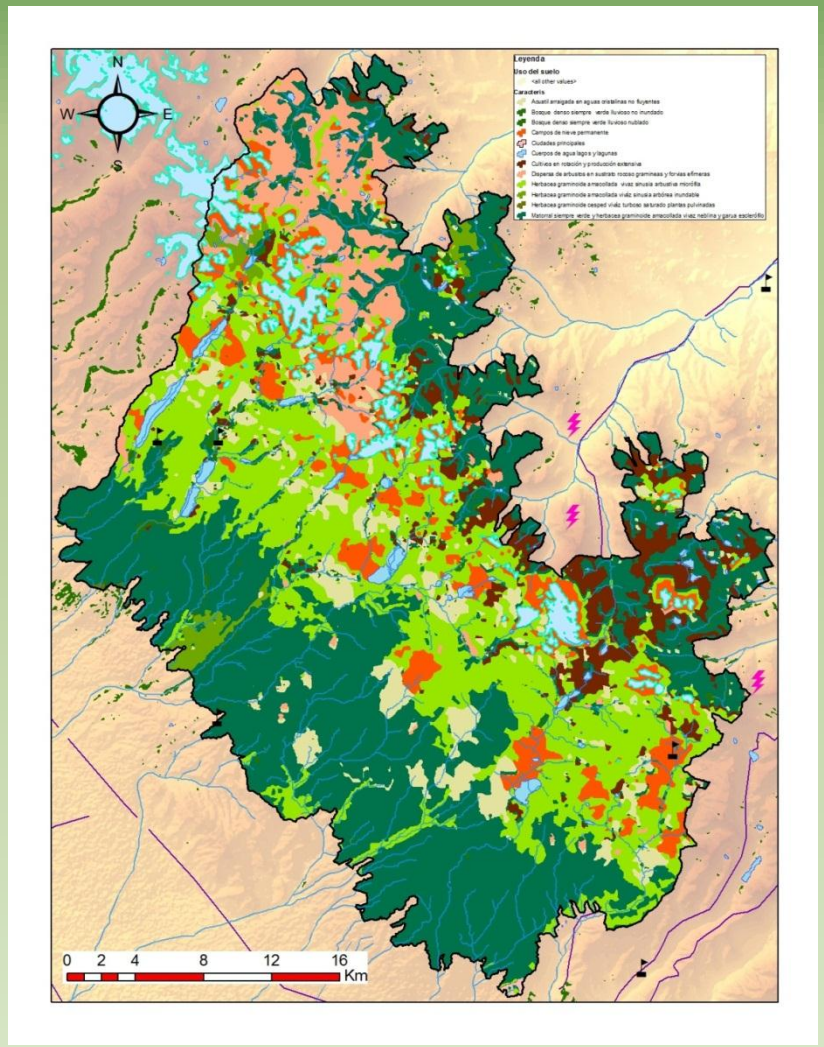
Glaciers and communities of the study area



Map by R. Tarquino

More maps - watersheds and land use





Maps by R. Tarquino

Tuni-Condoriri region

Bofedales – High Andean wetlands

Characteristics

- Livestock herding of lamas and alpacas in the high Andes depends on ***bofedales***.
- The **population** of the area is very **dynamic** (migration, seasonal migration).
- People are dedicated to a number of **different activities**: herding, agriculture, mining, tourism; and to economic activities outside the region: transport, construction, commerce.
- The region is at the same time the major **water catchment** for the metropolitan area of La Paz/El Alto.

Participatory research – methods used

- Interviews
- Focal groups
- Participa-tory mapping
- Simulation game

General findings

- With the **economic boom** of the past decade, agriculture has become less important for people´s livelihoods.
- Small scale **mining** activities and the influence of the **urban economy** of La Paz/El Alto are being felt strongly.
- **Water rights** and **availability** is a critical issue, due to plans for new storage facilities and climate change.
-


REGISTRO CIVIL

Findings related to *bofedales*

- **Llama** and **alpaca herding** are complementary activities, performed only by a part of the community.
- The main motivation is to maintain **rights to the territory** (not direct economic benefit).
- It has not been possible to establish a clear link between past **glacial recession** and the state of the ***bofedales***.

On the impact of climate change

- There is a clear **perception** that climate is changing (negatively).
- Impacts are mainly on the **hydrological cycle**.
- **Adaptation measures** are already being taken and tested on individual farmer´s level.
- (Temporary) **migration** to the city should be seen as an adaptation measure.
- There is very little activity on climate change by **local authorities** (*municipios*).

On communal organization

- Organizational patterns are in a process of transition: back to the indigenous „**ayllu**“ system, or maintaining **peasant union** structures.
- The process is not uniform and shows a number of **different elements**: communal vs individual, name vs structure, etc.
- Strong influence of **outside elements**: political and legal framework, large-scale water projects, proximity to large urban center.
- Cultural and organizational **feedbacks from migration**.

Indigenous vs peasant organization

Nombre de la comuni-dad	Número de fa-milias	Altitud (m)	Tipo de organización	Forma de manejo del suelo
Tuni (=Chu-ñavi)	50	4.437-3. 850	Ayllu Indígena Originario	Manejo comunal en la parte de *ayllu;* manejo individual en la parte del sindicato agrario
Condoriri (=Palcoco)	40	4.588	Sindicato campesino	Manejo individual y manejo comunal
Alto Peñas	70	4.500-3.900	Sindicato campesino	Manejo individual
Suriquiña	85	4.600-3.850	Sindicato campesino	Manejo individual
Alto Milluni	20	4.758	Ayllu Indígena Originario	Manejo individual
Botijlaca	6	4.518	Sindicato campesino	Manejo comunal

What´s next?

- In terms of the project:
  The completion of the **agent-based modelling**.

- For the study area:
  The **end of the economic boom** in Bolivia.


Thank you for your attention
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Additional information

References

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Published article

Ecología en Bolivia 49(3): 132-140. Diciembre 2014. ISSN 1605-2528.

Métodos para caracterizar la dinámica de los sistemas socio-ecológicos asociados a los bofedales altoandinos (Cordillera Real, Bolivia)

Methods for the characterization of the dynamics of socio-ecological systems associated with high Andean wetlands (Cordillera Real, Bolivia)

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