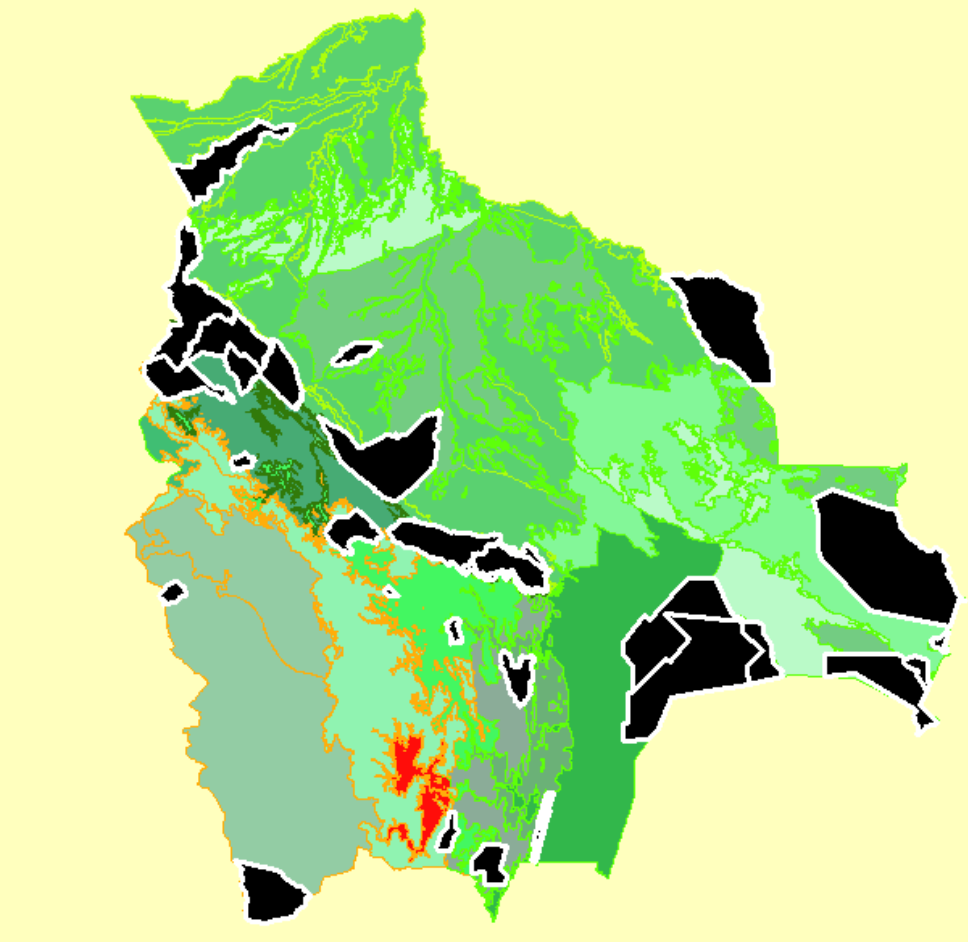
The Monitoring Program in Apolobamba Protected Area

Tarquino R, Aguirre. G & Guaman, R

Protected areas in Bolivia



Bolivia have 22 protected areas of national feature, over-lapping in 12 of 13 ecoregion (by Ibish)

More than 15% of the territory is under protection (by SERNAP)

The main objetive of protected areas are both, preserve the relationship between the ecosystems and support the maintenance and quality of the environmental services

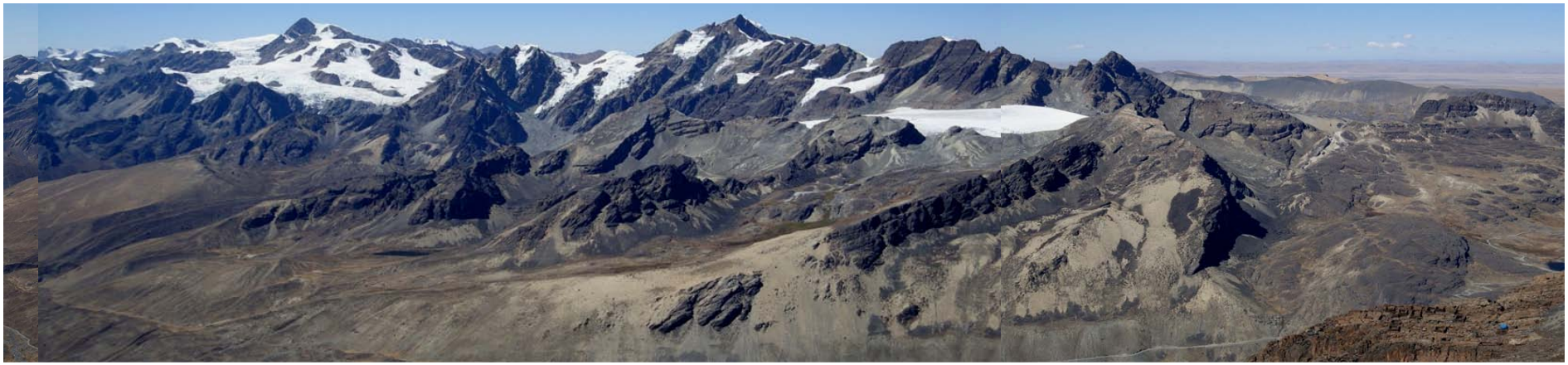
Fuente: SERNAP/PM, 2006

Categories and International Systems

Bolivian laws of Protected areas	Category of UICN I - VI
National Park (NP)	II
Wildlife Sanctuary (WS)	III
Natural Monument (NM)	III
National Wildlife Reserve (NWR)	IV
-	V
Integrated Management Natural Area (IMNA)	VI
Transition Area (When is not define)	-

Apolobamba

Location



View of Cololo, magnificent landscape in Apolobamba

Features of Apolobamba

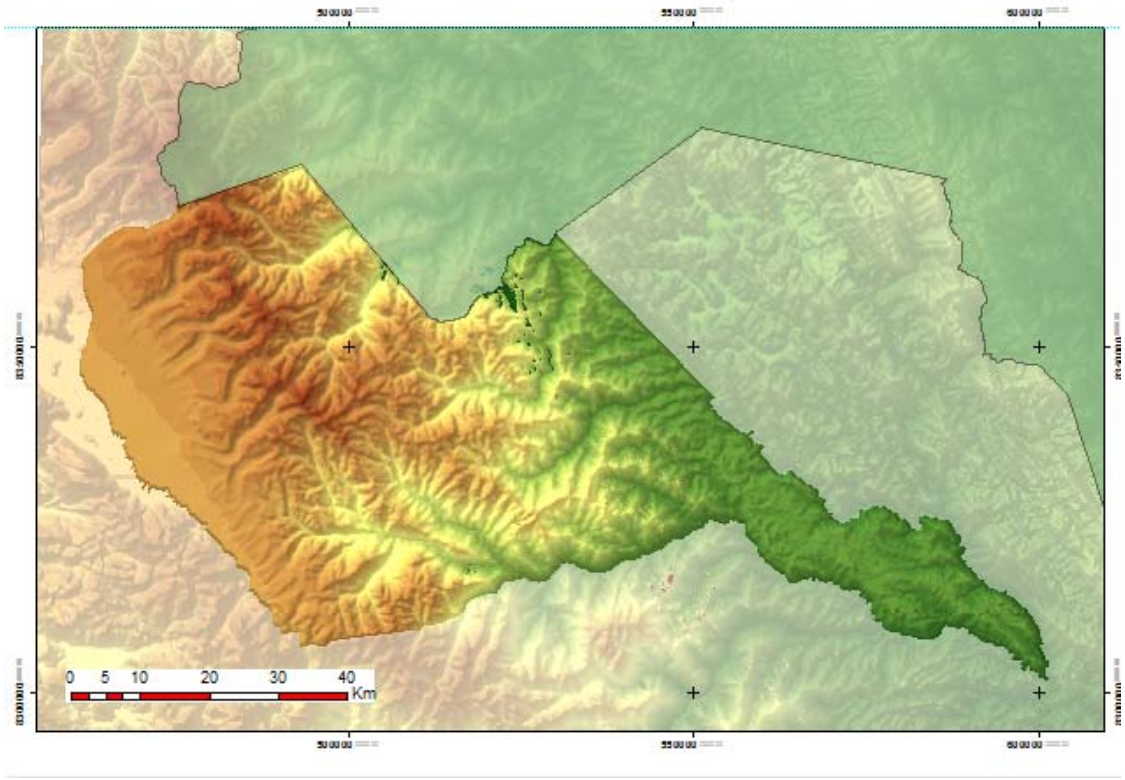
Length: 4.837 Km^2

Height: 5.850 to 650 meters above the sea level

Landscape: Apolobamba, Madidi & Pilon Lajas, are protected areas of the region those cover the water sources in that region

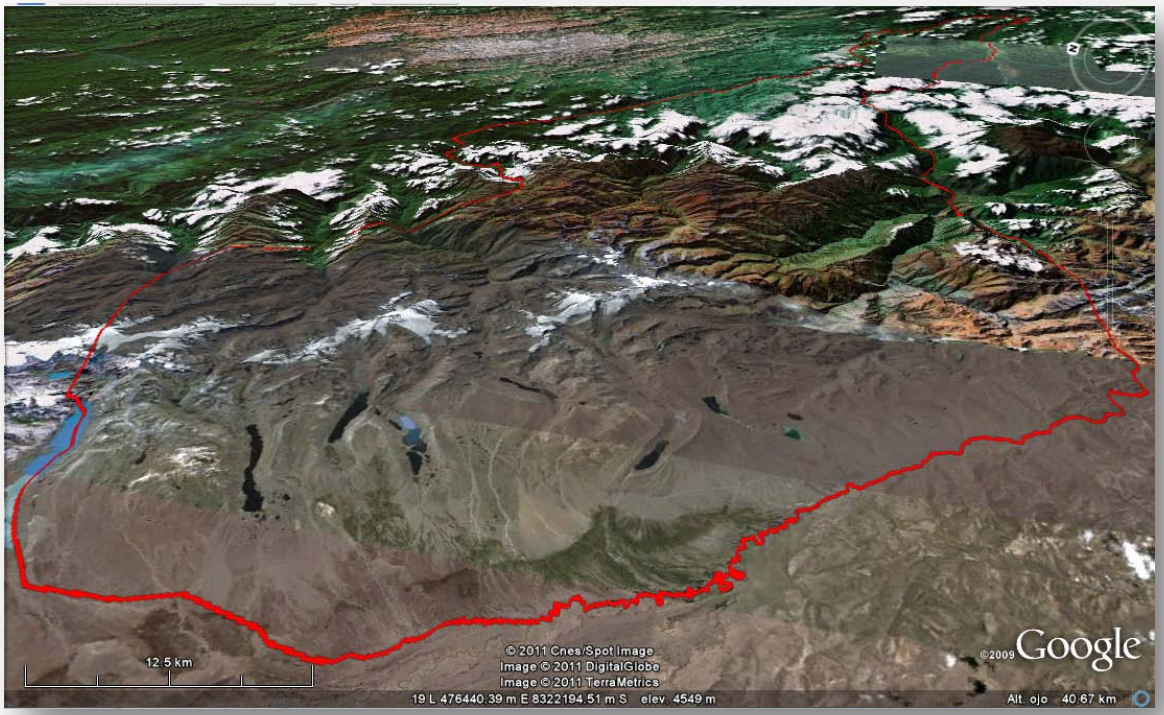
National framework of conservation

- Apolobamba region is located in La Paz State, Four municipalities are involved in the management of that protected area, Pelechuco, Curva, Charazani & Mapiri. In the border with Peru.



Fuente: SERNAP, 2005

Function for ecosystems



Apolobamba

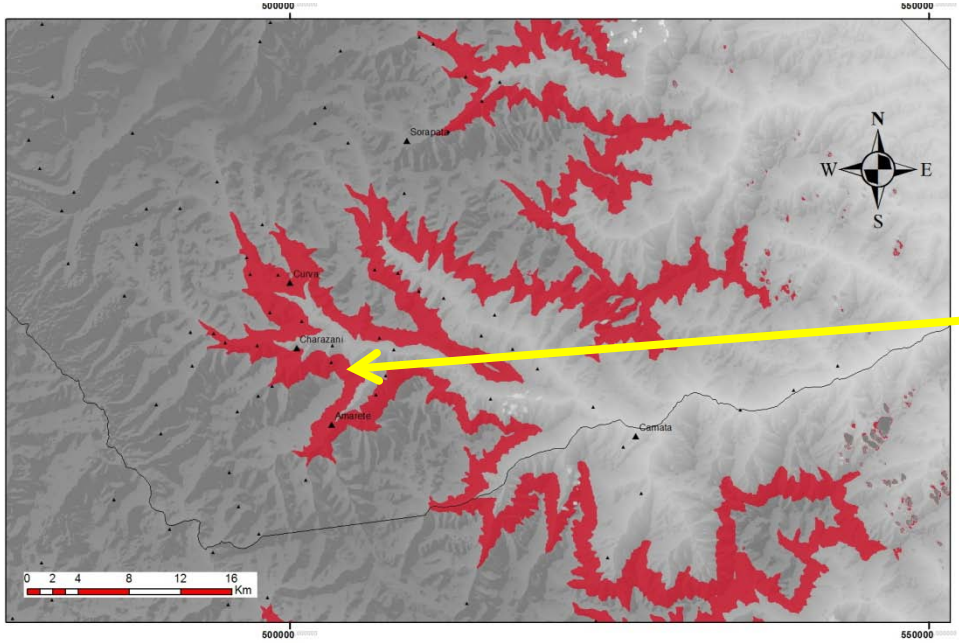
The region is considered a protected area, to help in management of wildlife population of Vicuña (*Vicugna vicugna*).

Apolobamba feed the basin of Titicaca lake and in the other side feed the Beni basin, part of amazonas

Fuente: PM, 2006

Culture and relationship with the landscape

- Apolobamba valleys are the place when live an ancient cultures “Kallawaya”
- All of them live among 3200 – 3800 m, they think’s healthly live in that height (Oblitas, 1972).
- They use the landscape like vertical ecosystems
- It’s common find Quechuas and Aimaras too



Fuente: Elaboración propia

Culture and relationship with the landscape

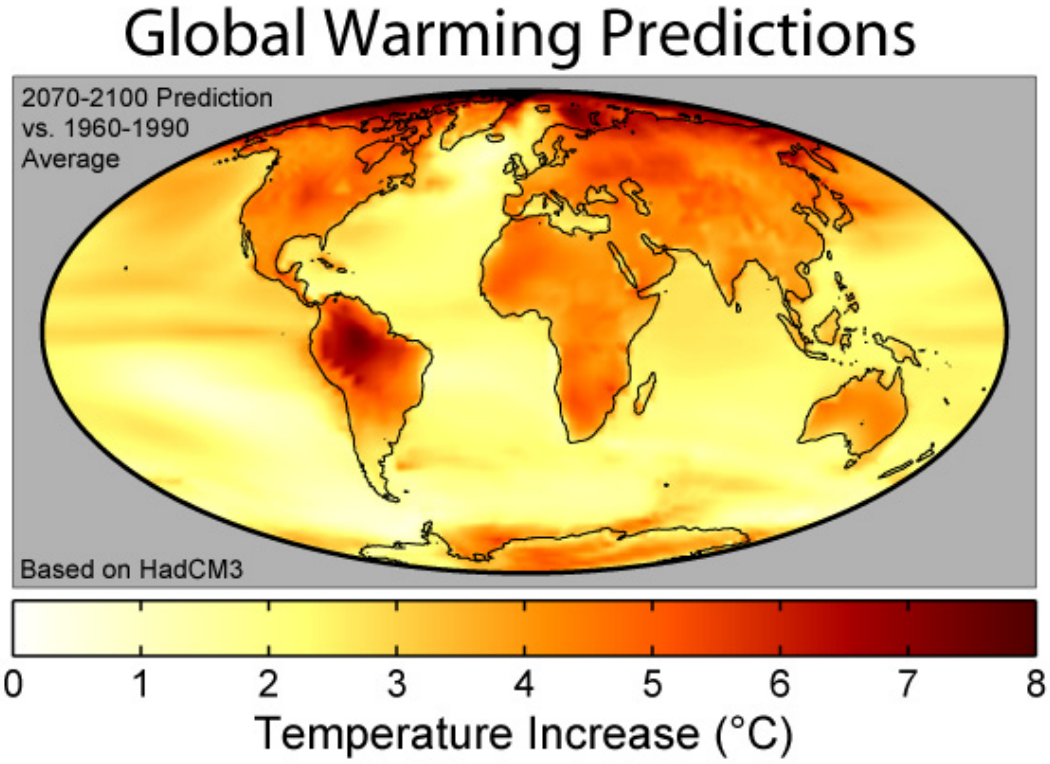
Kallawayas weave in their blankets "maps", to remember the way to home

Threats and problems

APOLOBAMBA

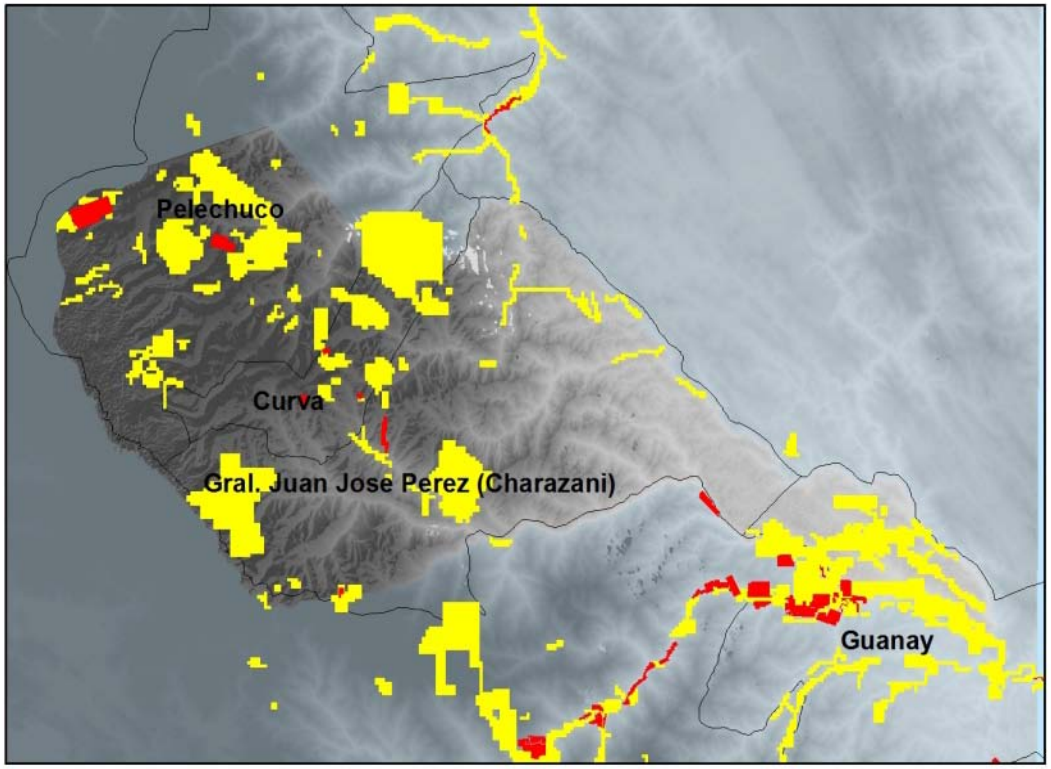
External threats

- National and global policies (Kioto, expansion policies inside Bolivia)
- Global Change facts (Land cover change, roads)
- Climate change facts (rise of temperature, change in the humid values)



Local threats in Apolobamba region

- Cooperative mining activity without control
- Overgrazing livestock (Alpacas, sheep)
- Opening of roads in restricted areas
- Changing land use



What is the Monitoring Program in Apolobamba?

- Is a Tool for managing the protected areas, known the threats and generate information about protected area (PA)
- Monitoring allow known biodiversity and the resource use inside the PA
- Understand another issue (planning, training, financial, participation & others)

How we get this!

1. The PA monitoring determine which management actions are effective or not.
2. It measures in the medium and long term effects of the environmental impacts.
3. Allow make decisions or provide contingency actions to prevent wrong ways of management of the territory.

What is the Monitoring Program in Apolobamba?

Objective:

Generate information of the state of conservation, management and protected area degradation and **generate reports** to support a better information about Apolobamba, that **lead to better decision making** and known the **health situation** of the PA.

Supports:

The generation of information (maps, databases, baselines, monitoring instruments)

Generates reports (Reflects the status of activities and is supported with primary databases that allow other more complex analysis)

The generation of strategic alliances (Universities, NGO's, Government)

Support the develop of tools like environmental education strategy, Zoning PA, develop a research program)

Monitoring Program in Apolobamba

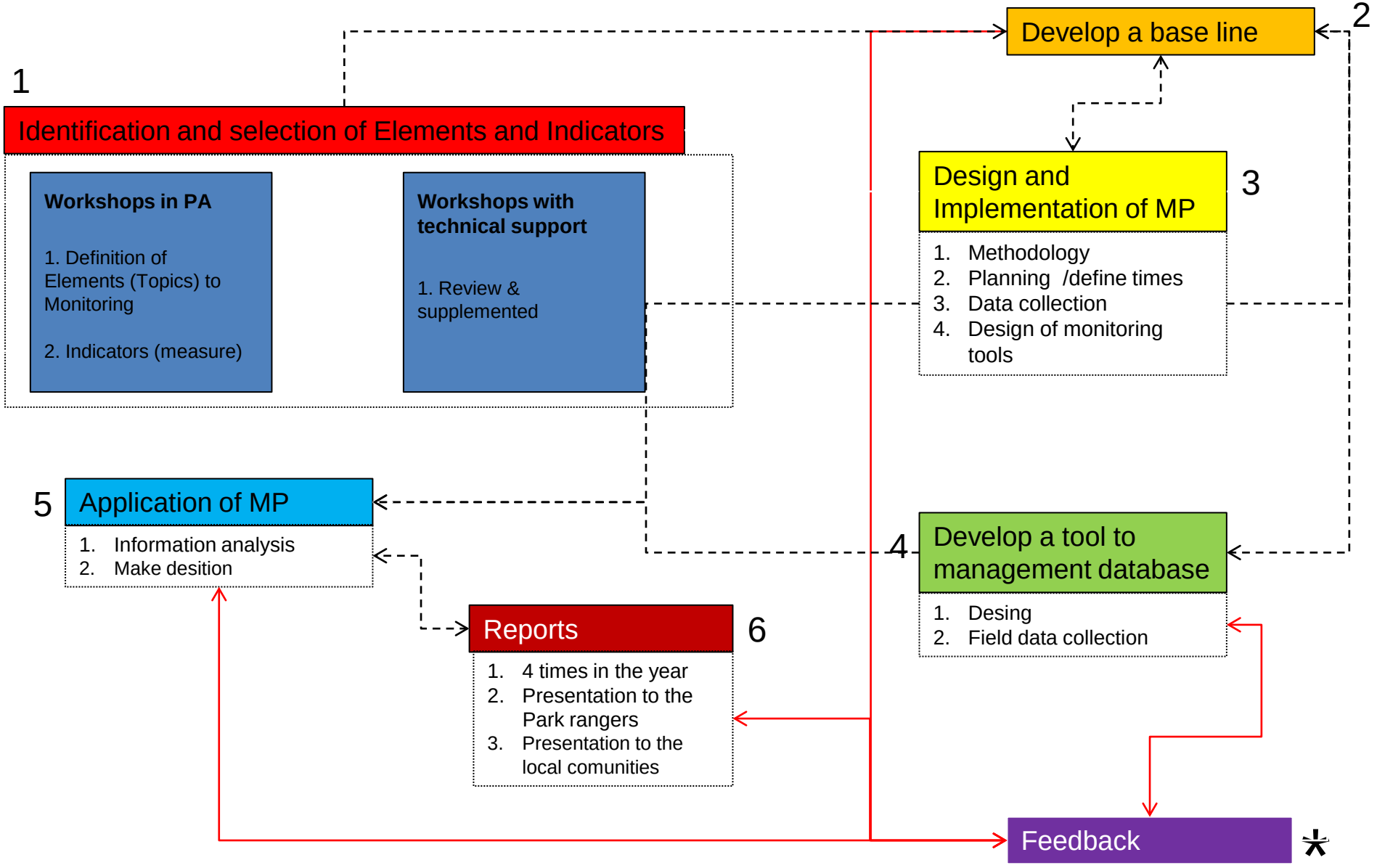
Work under the next topics:

- All was support on Clear lines to establish the program (Strategic topics of SERNAP, 2006)
- Lean in Basic technical skills (those park rangers)
- Focus on some Indicators applicable to specific cases (low cost and to resolve specific issues)
- Participatory (people opine and learn the information)
- Screening time (simple logistic)

Monitoring Program in Apolobamba Workshop

PMI - 2010

Steps for Building the MP



Elements identified for Monitoring

Topic 1.a

Element: Bodies of Water

Element: Glaciers

Element: Root and Tuber Andean crops

Element: Wildlife

Element: Wetlands

Element: Mining

Topic 1.b

Element: Knowledge of medicinal plants

Element: Rituals

Topic 2

Element: Tourism

Element: Vicuña

Element: Fish

Topic 3

Element: Management Committee

Topic 4

Element: Conventions and Agreements

Topic 5

Element: Laws (municipalities)

Element: Education

Topic 6

Element: Funds managed and financial performance

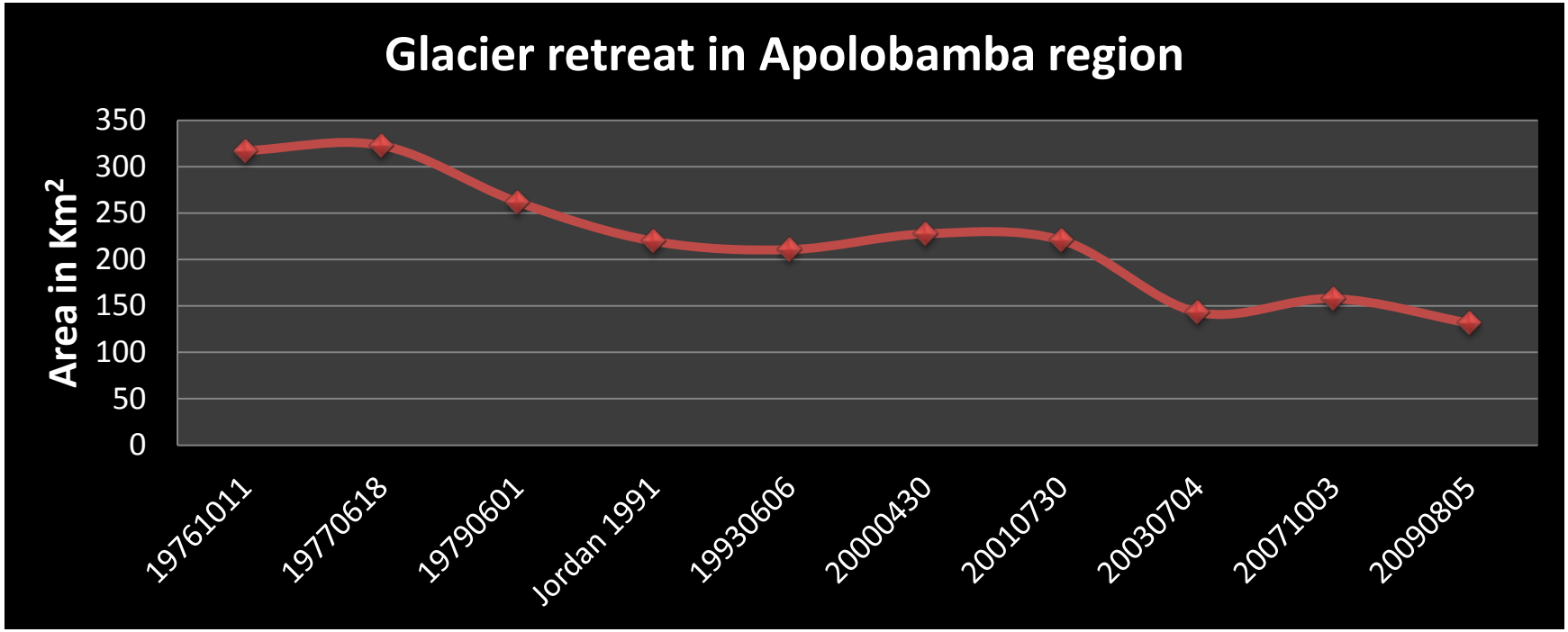
Glacier retreat

Apolobamba

Glacier retreat in Apolobamba

Bolivia has a total area for glacier of 566 Km^2 , in whose Apolobamba represents 37% of this surface (with data through 2009).

In 1976 there was an area of 317 km^2 in 2009 reached a surface area of 131 km^2.

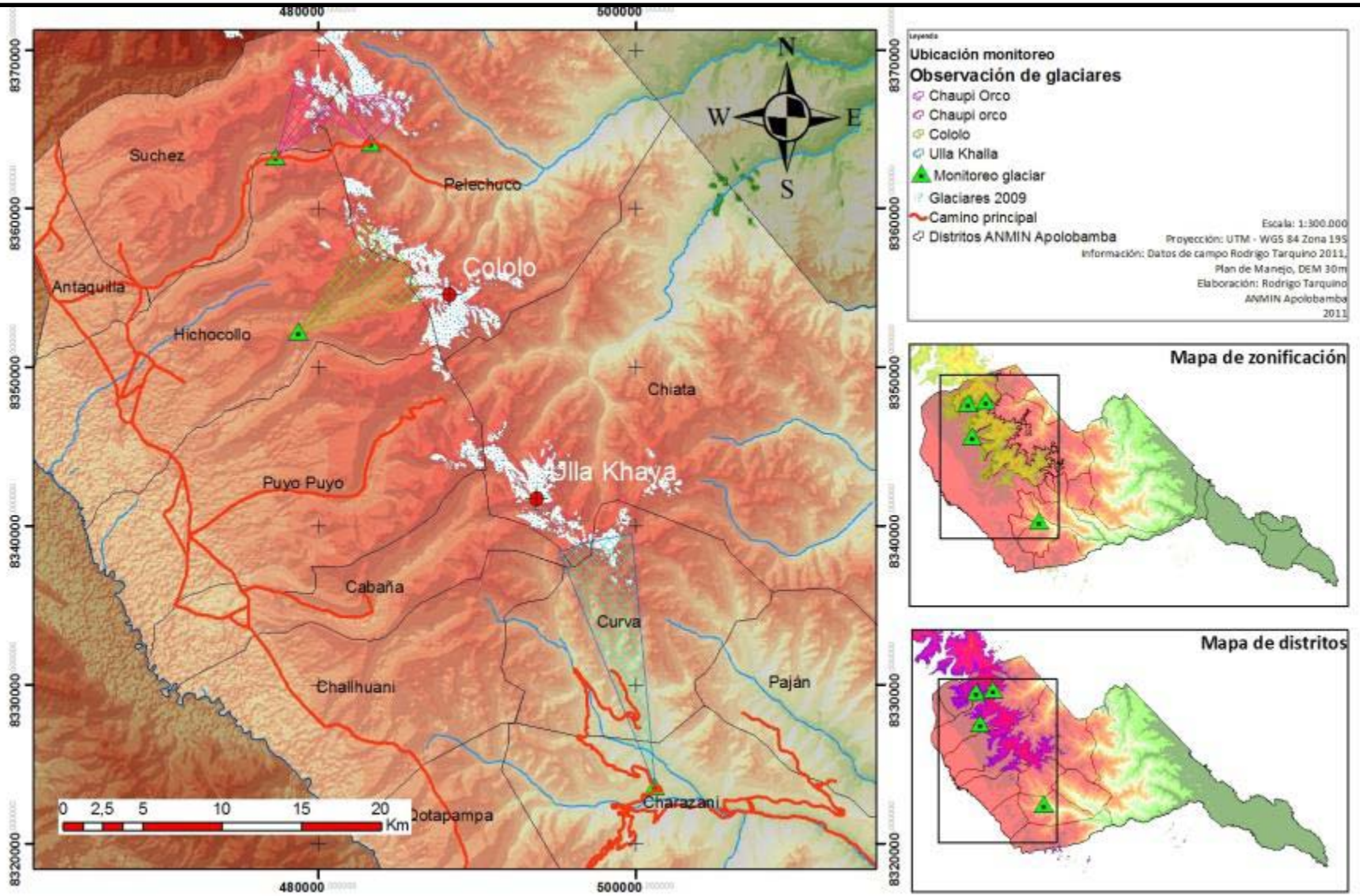


Fuente: PMI, 2010

Historical comparison

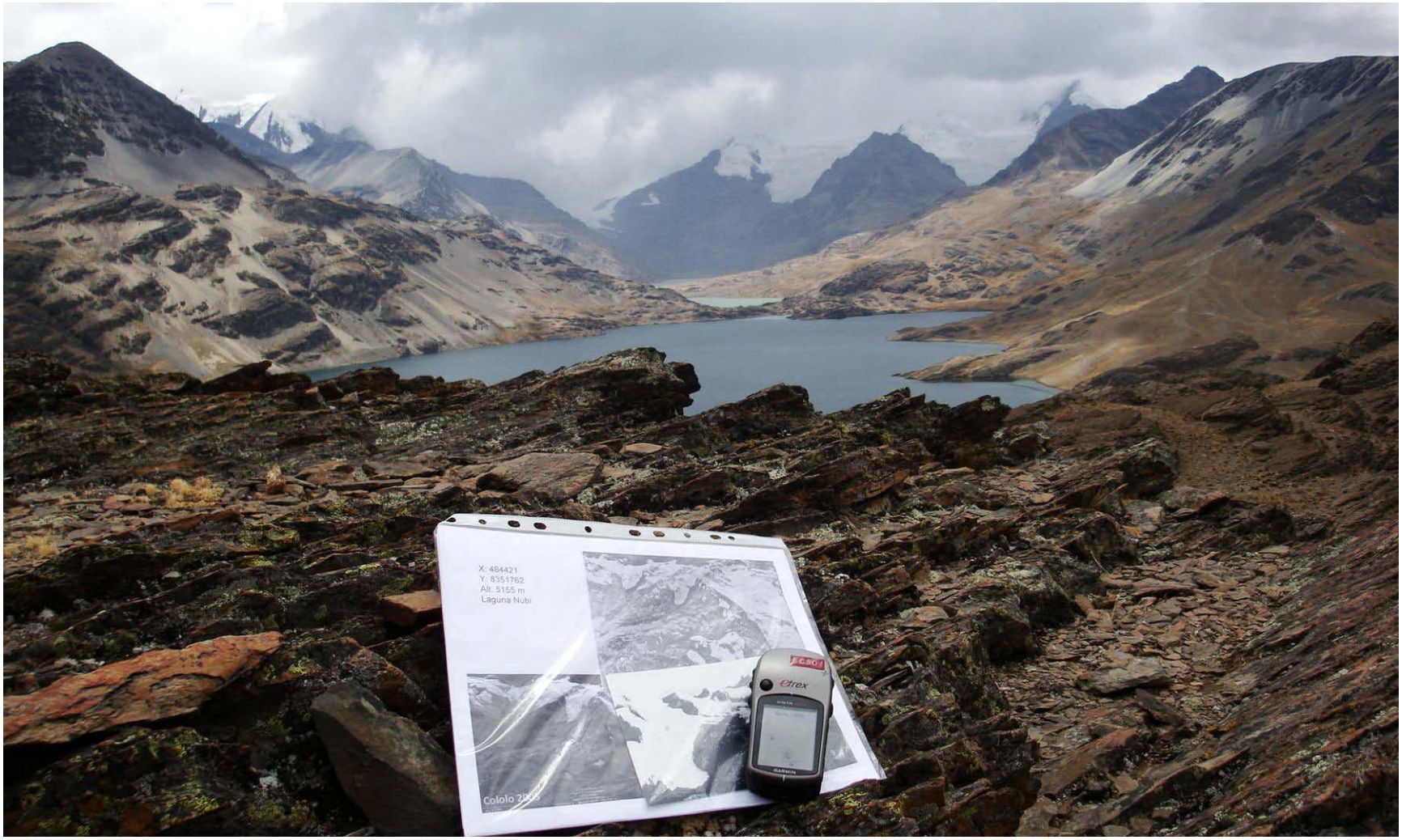
Fawcett , 1911

Location of monitoring points of glaciers



Fuente: PMI, 2010

Field work – searching comparative points to monitoring



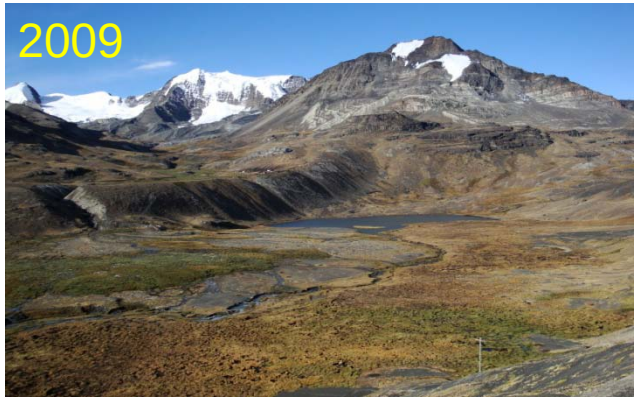
Establishment of monitoring points

Park rangers working in the field

Historical comparison

Pawcett , 1911

Monitoring by Park rangers



Glacial lakes

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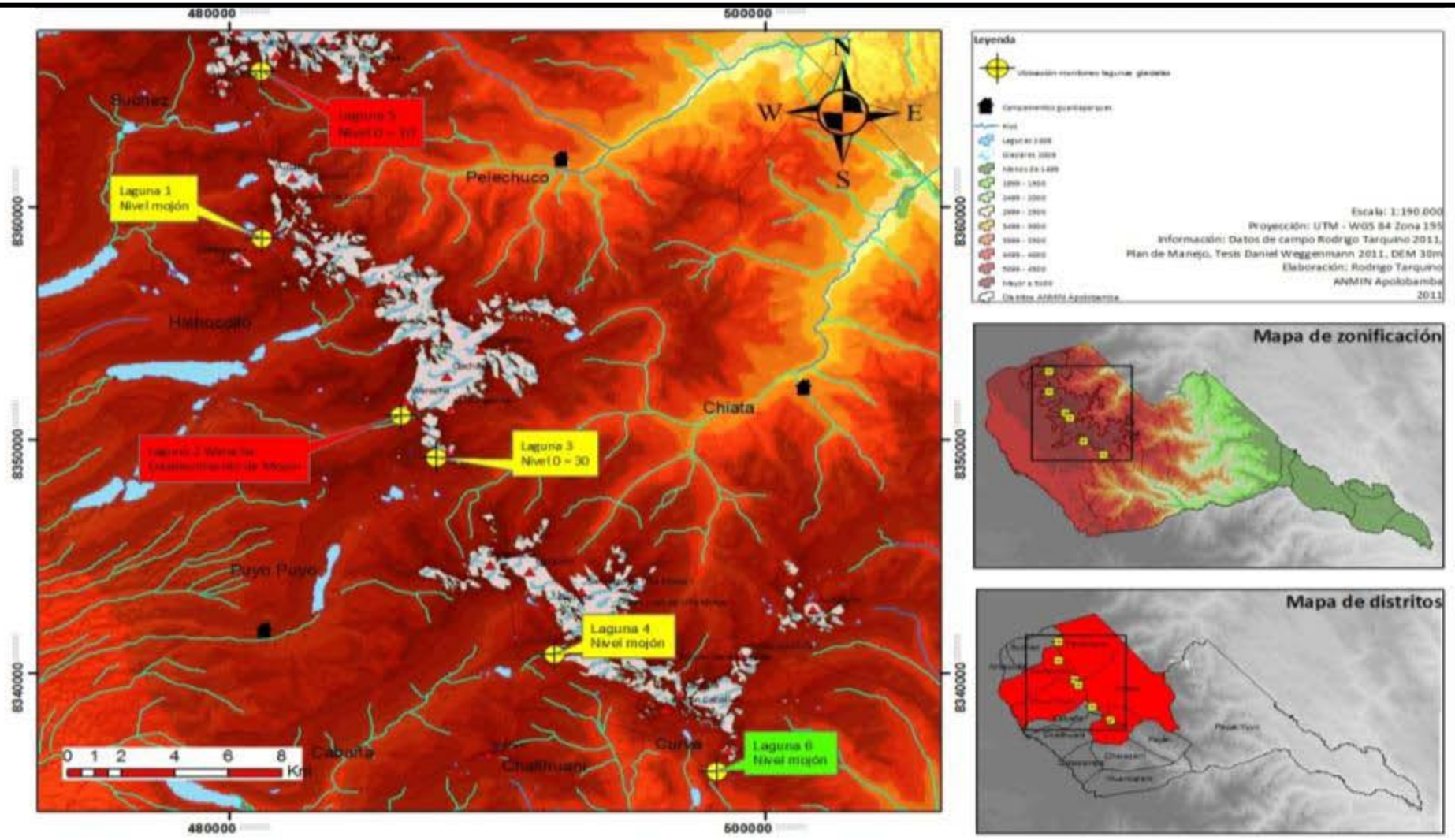
Location of monitoring points

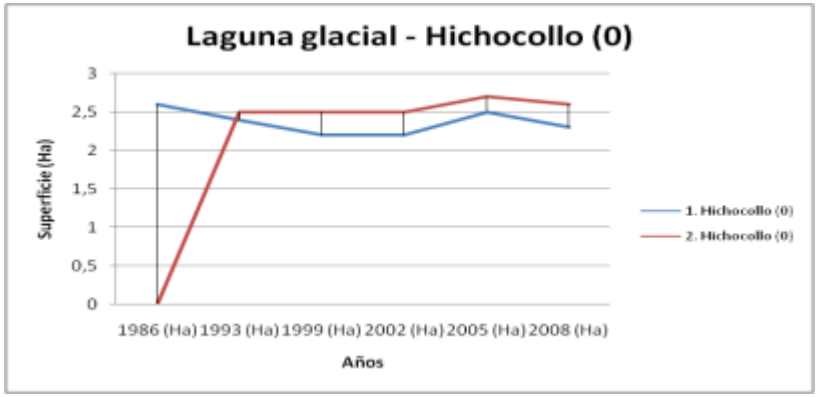


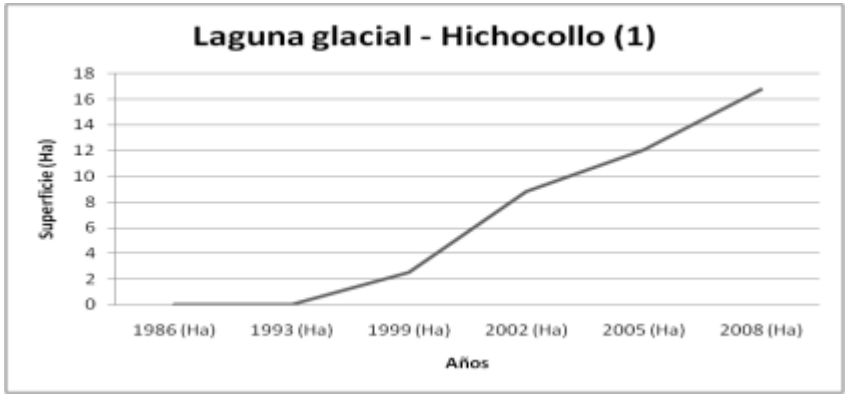
Monitoring Program

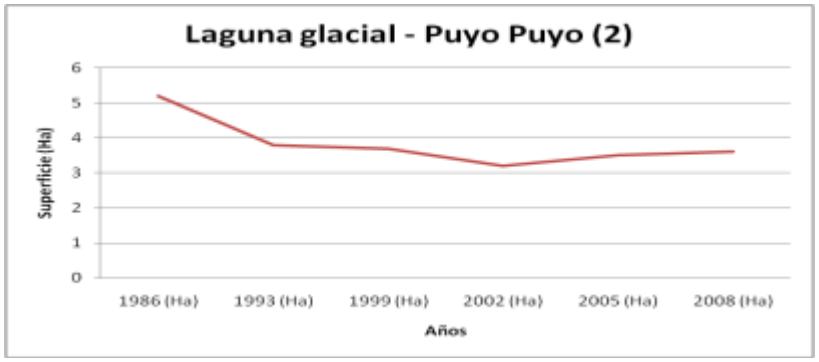
Glacial lakes

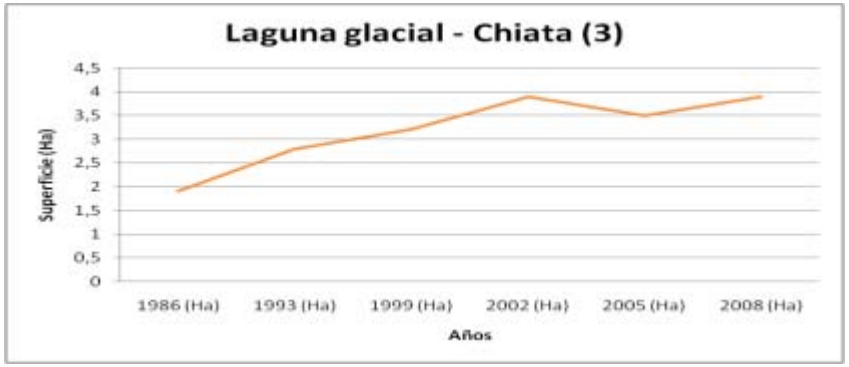
Establishment of Monitoring points of glacial lakes in Apolobamba

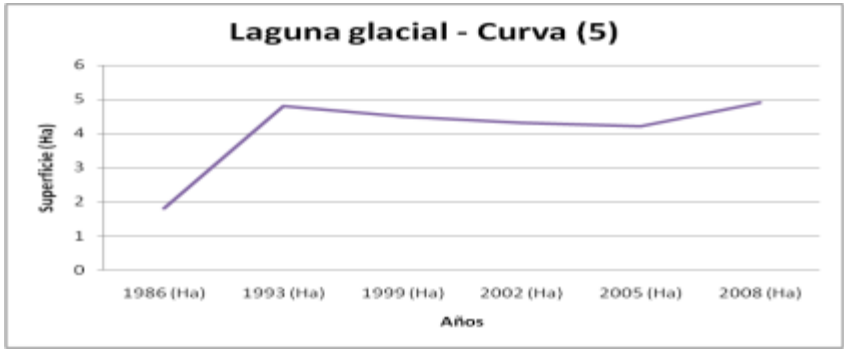
Measure the glacial lakes











Measure

Geologic lakes

ÁREA PROTEGIDA
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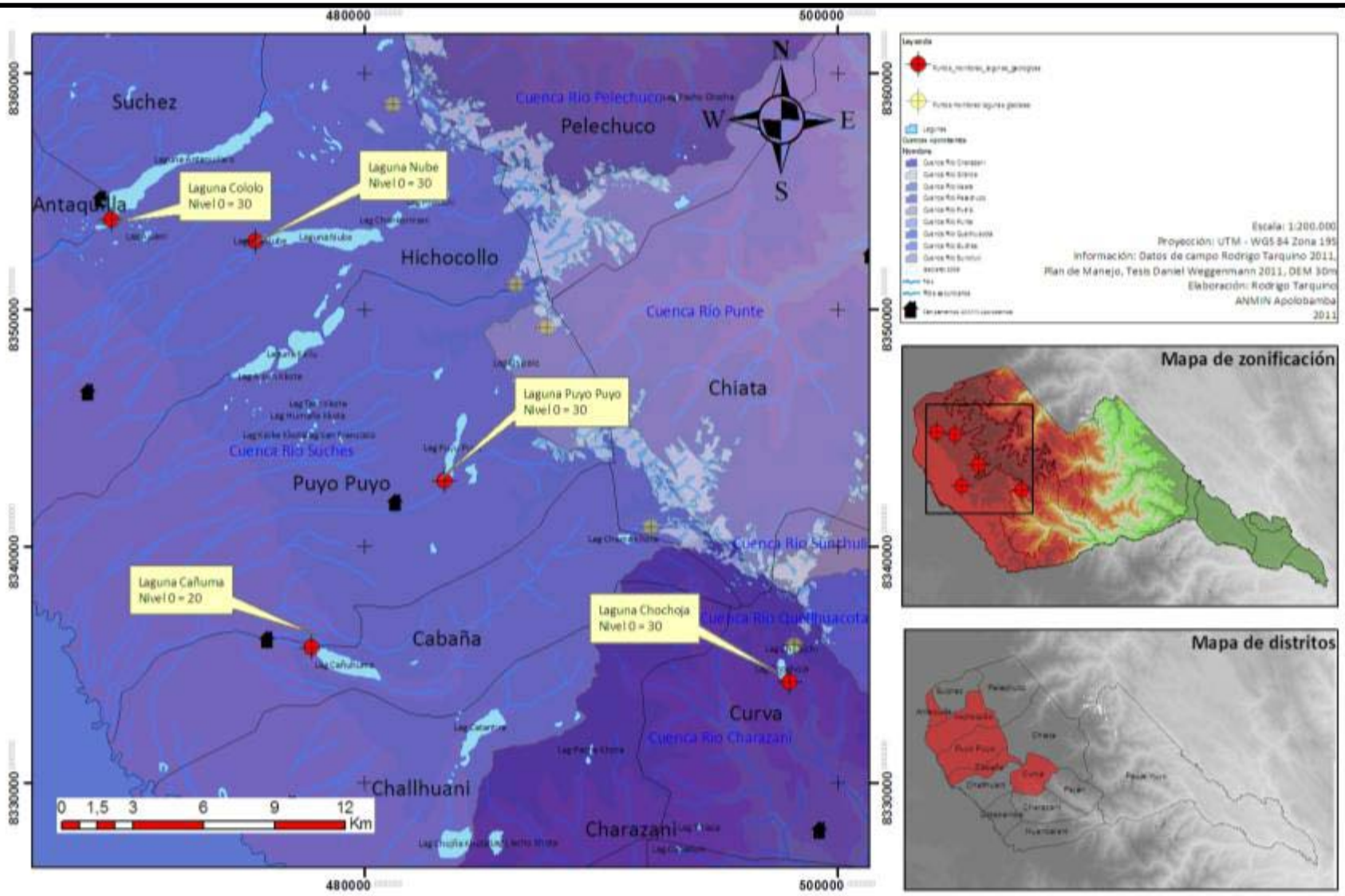
Location of monitoring points



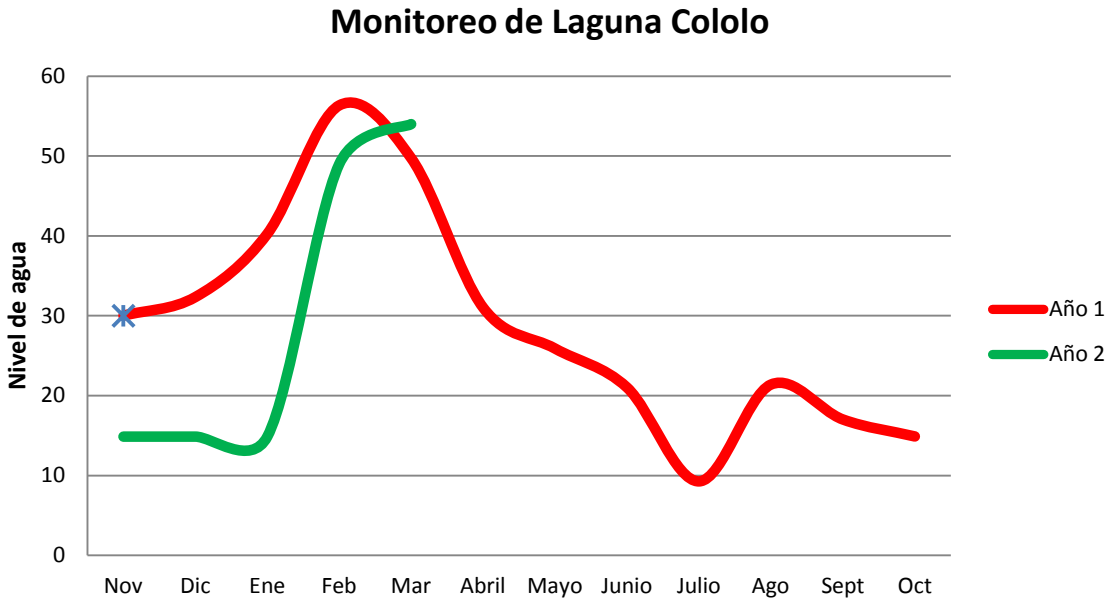
Installing monitoring points

Park ranger installing the monitoring points in different areas of Apolobamba

Method to obtain information of geological lakes

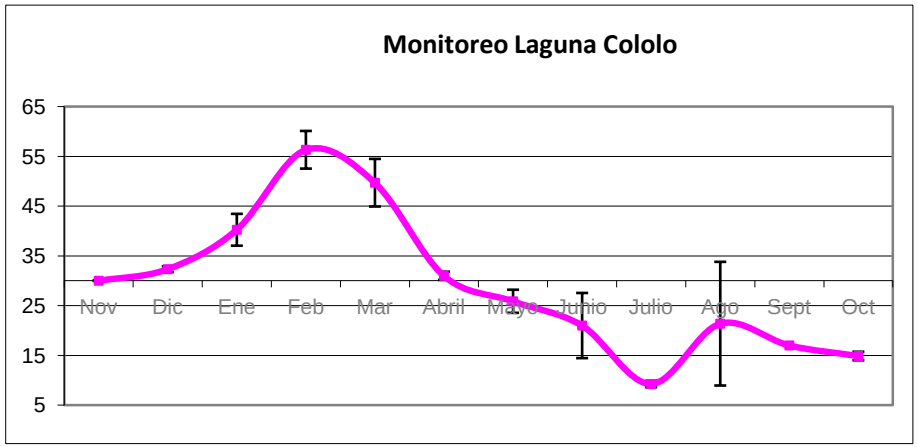
For the baseline

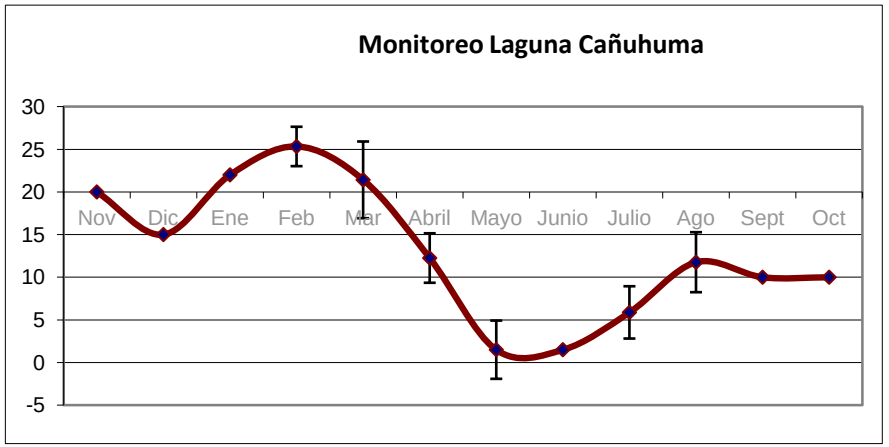
1. Gathering information about lakes
2. Location map generation
3. Installing rules to measure the level of water
4. Measurement (Training in filling out forms, monthly reports)
5. Generating reports

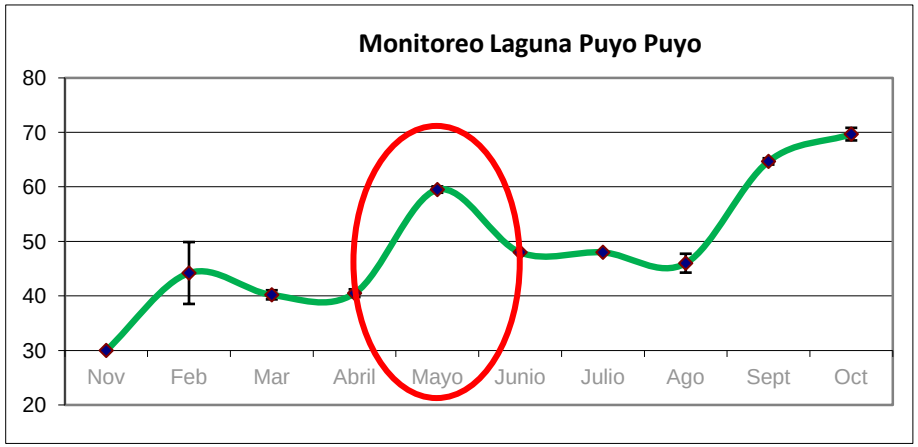


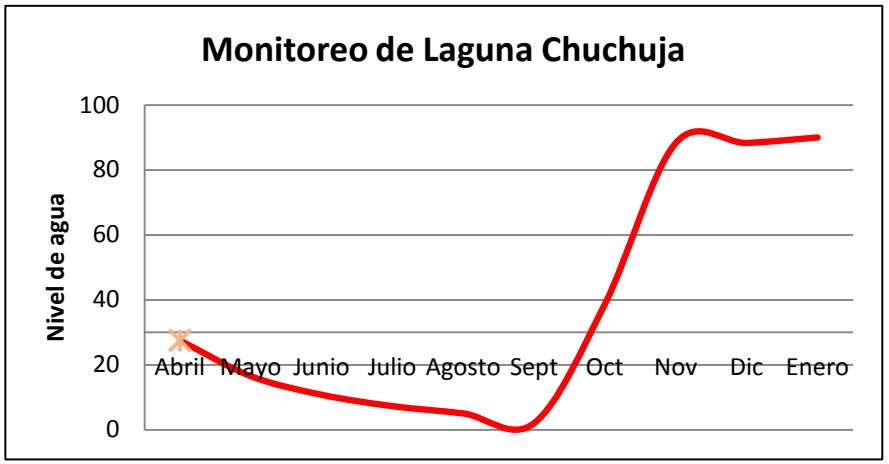
Fuente: Tarquino, 2010

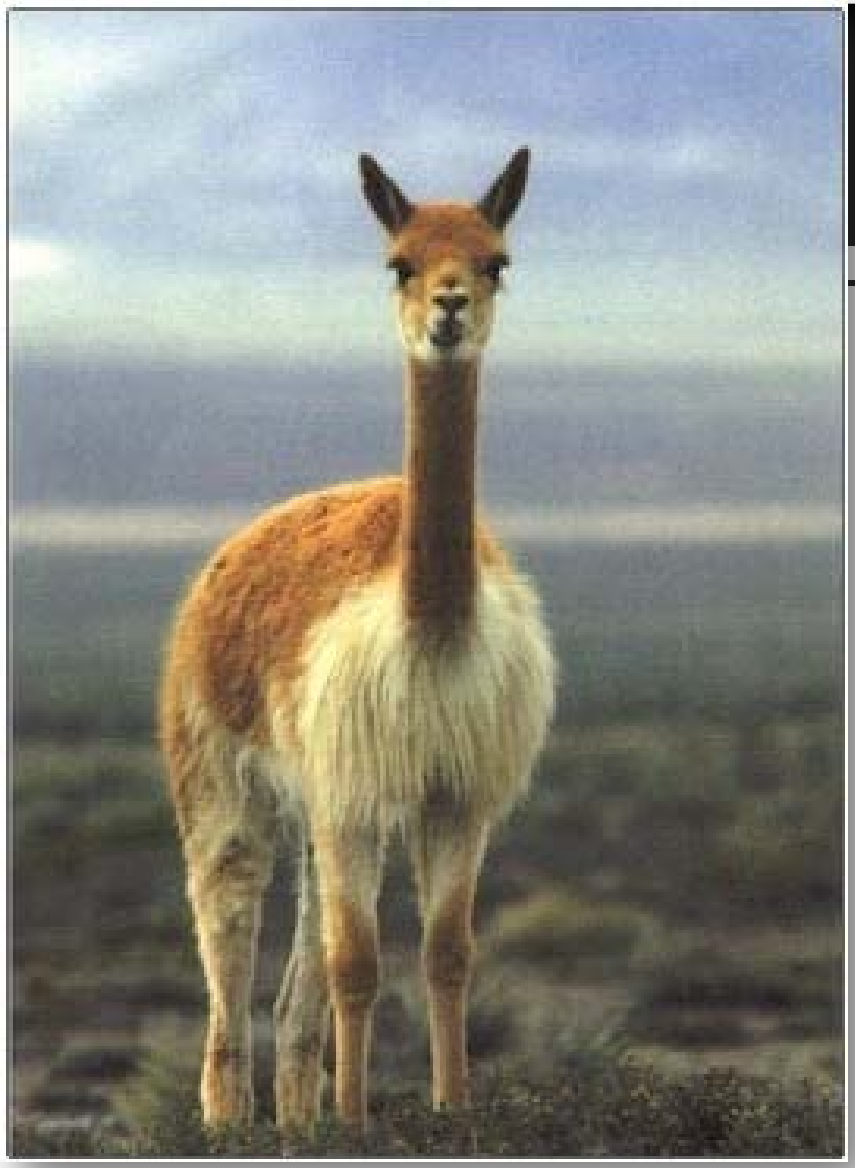
Geologic lakes











Vicuña (*Vicugna vicugna*)

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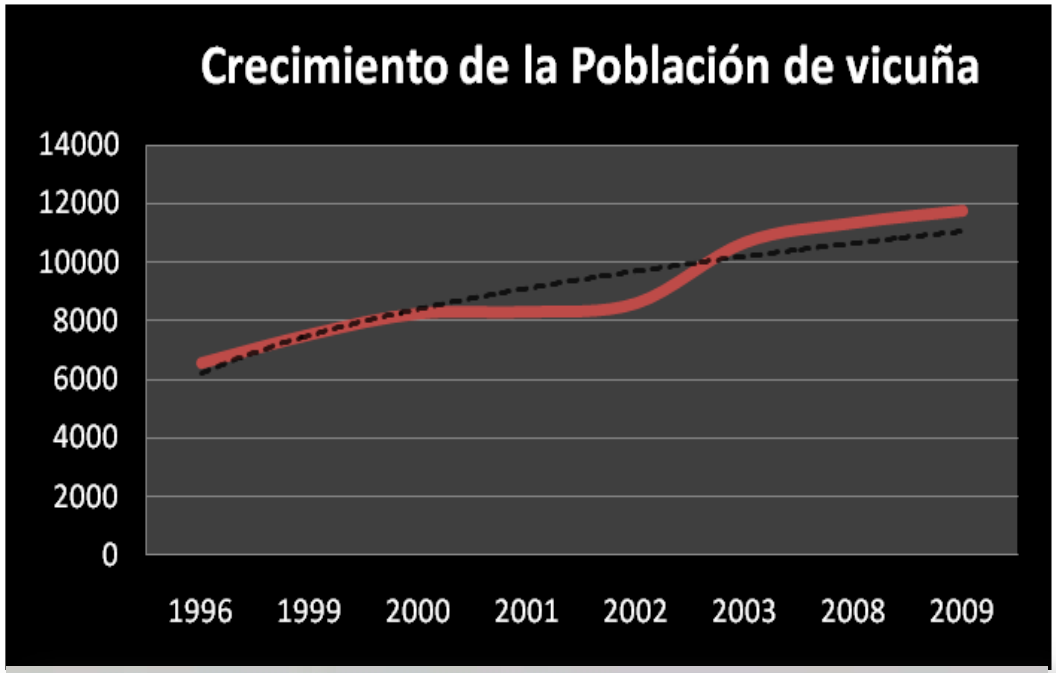
APOLOBAMBA

Population growth of Vicuña



The conservation program of the vicuña (*Vicugna vicugna*) support achievement of population stabilization. Besides promoting the use and development.

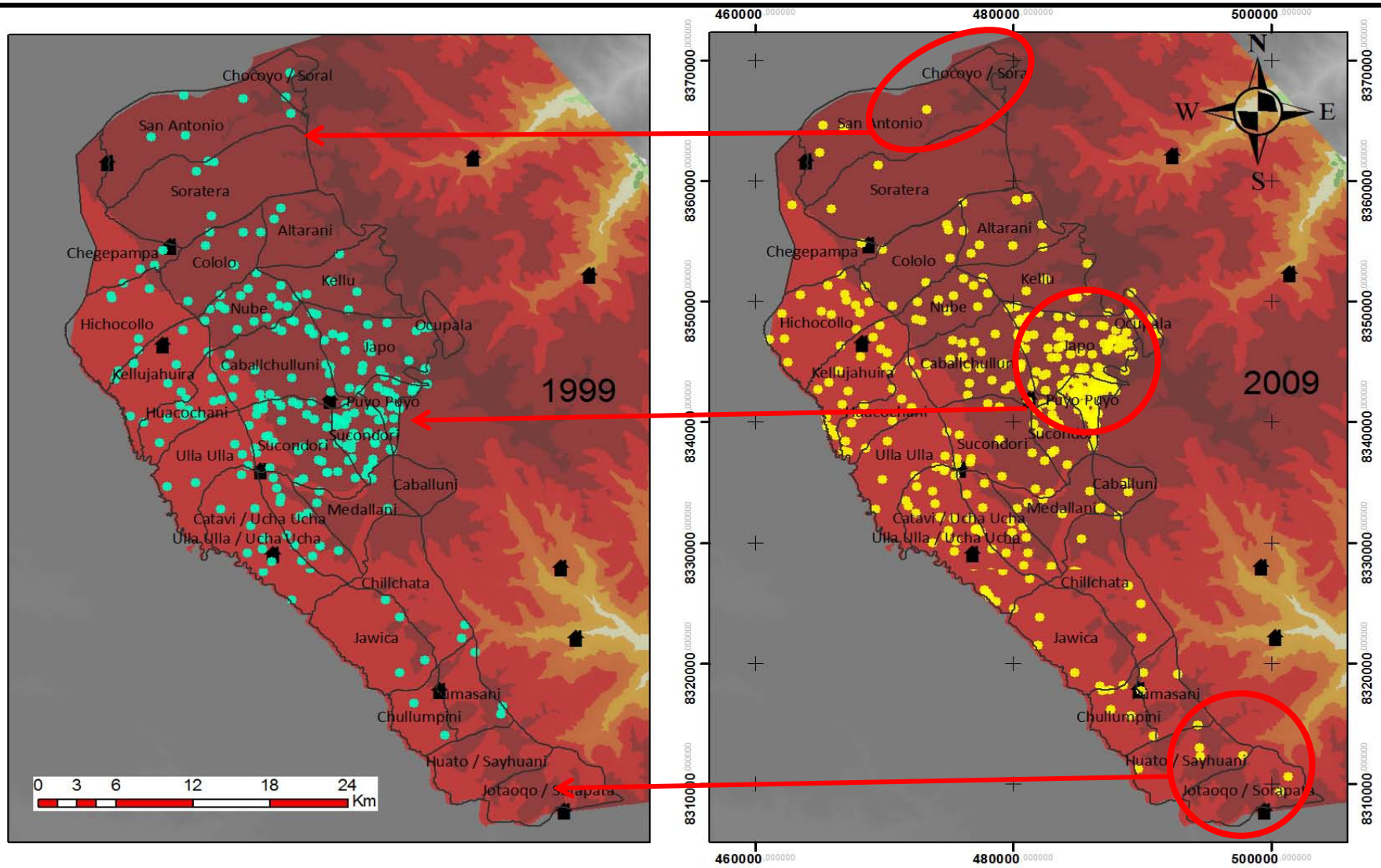
Fuente: PMI, 2010

Use and conservation compatibility

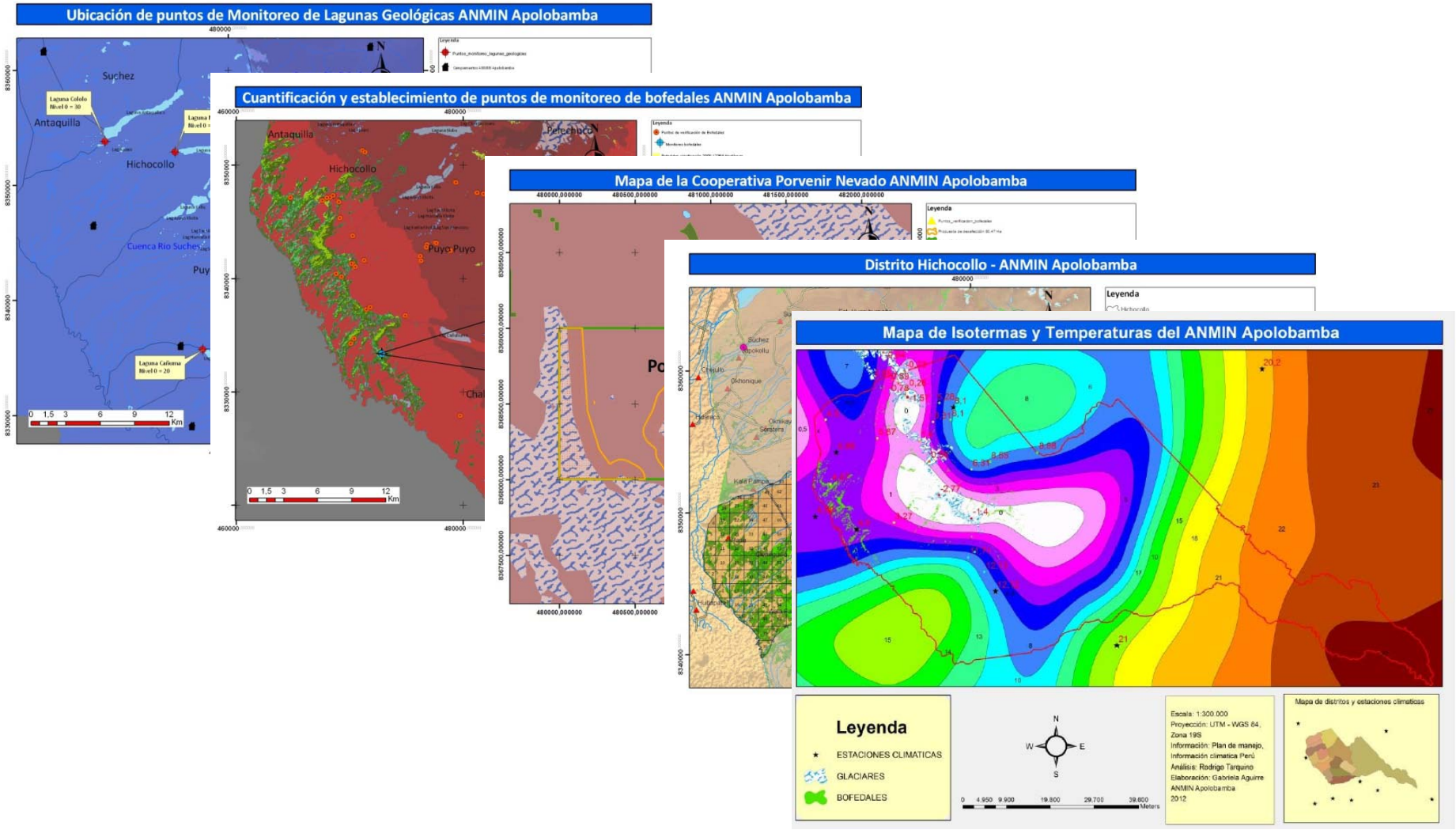
Recovering vicuña population, worked and succeeded in setting policy and legislative instruments for the use of this resource by local communities, as well as sole beneficiaries.

Fuente: Gaceta Oficial 29159, 2006

Comparison of the distribution after 10 years



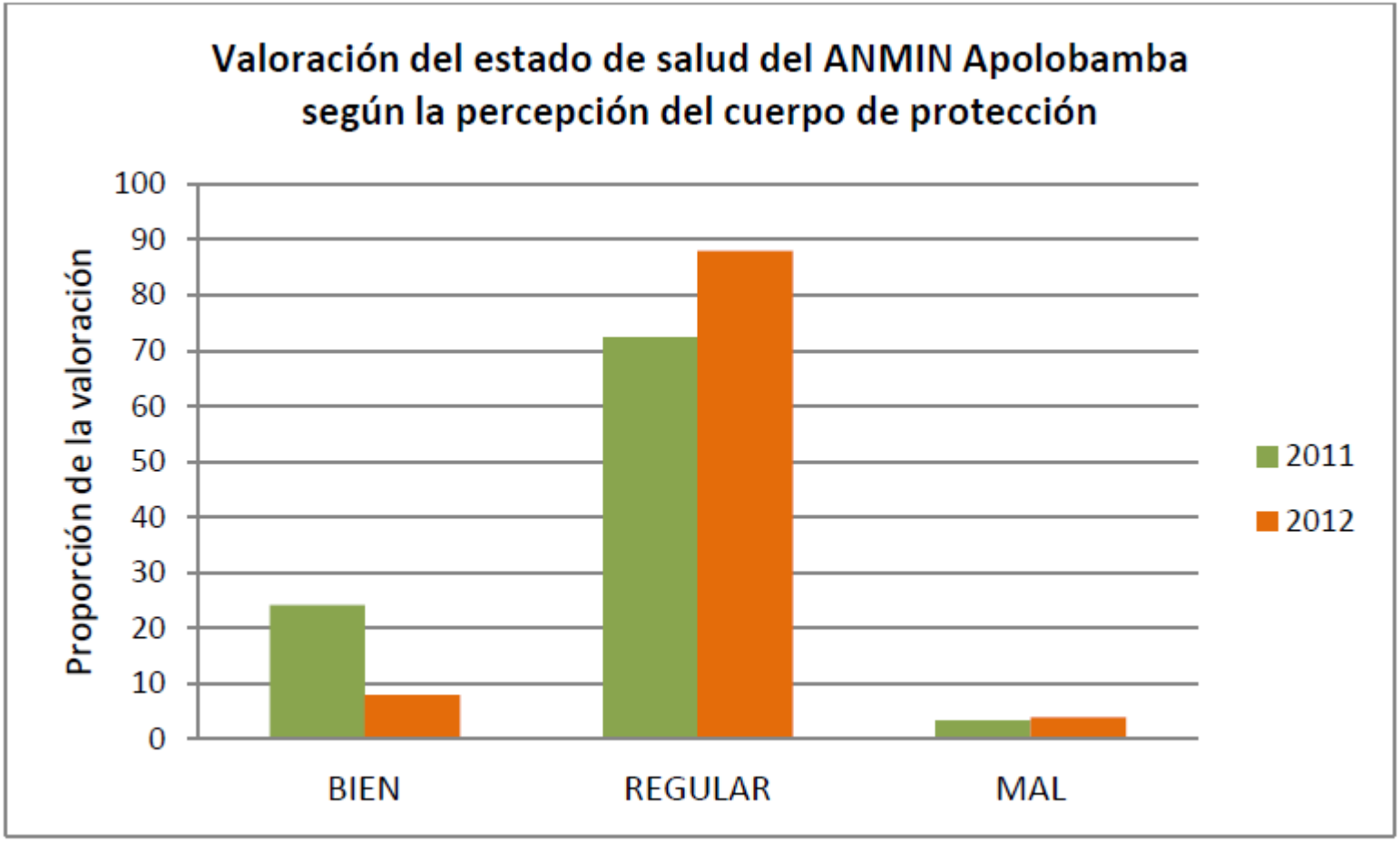
Other topics



Fuente: PMI 2010

Discussion & Conclusions

Discussion & Conclusions



We have to work with other institutions with the same objetives

Monitoring program and support of the team

Help to analyze biodiversity information & capacity building

REPC

Capacity building

Develop a Environmental education Strategy

Support the research program

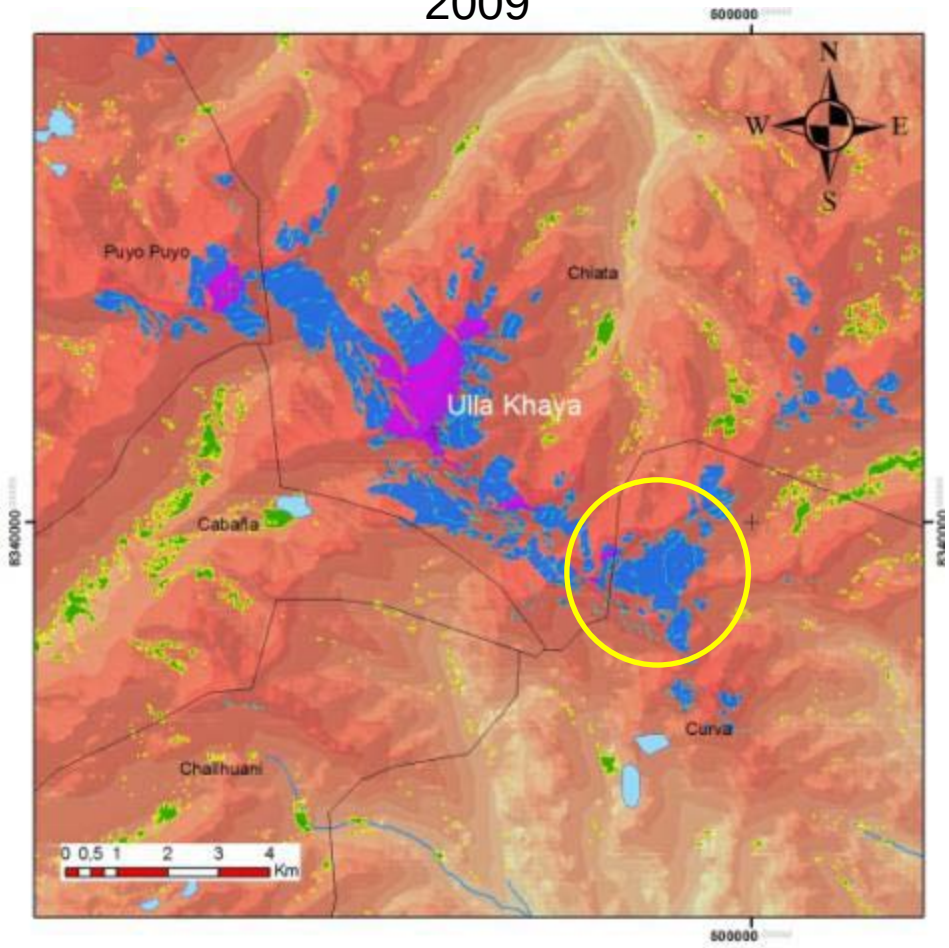
Discussion & Conclusions

Glacier retreat is a clear indicator of climate change in Andes region, this not only causes a change in natural systems (water storage, climate driver).

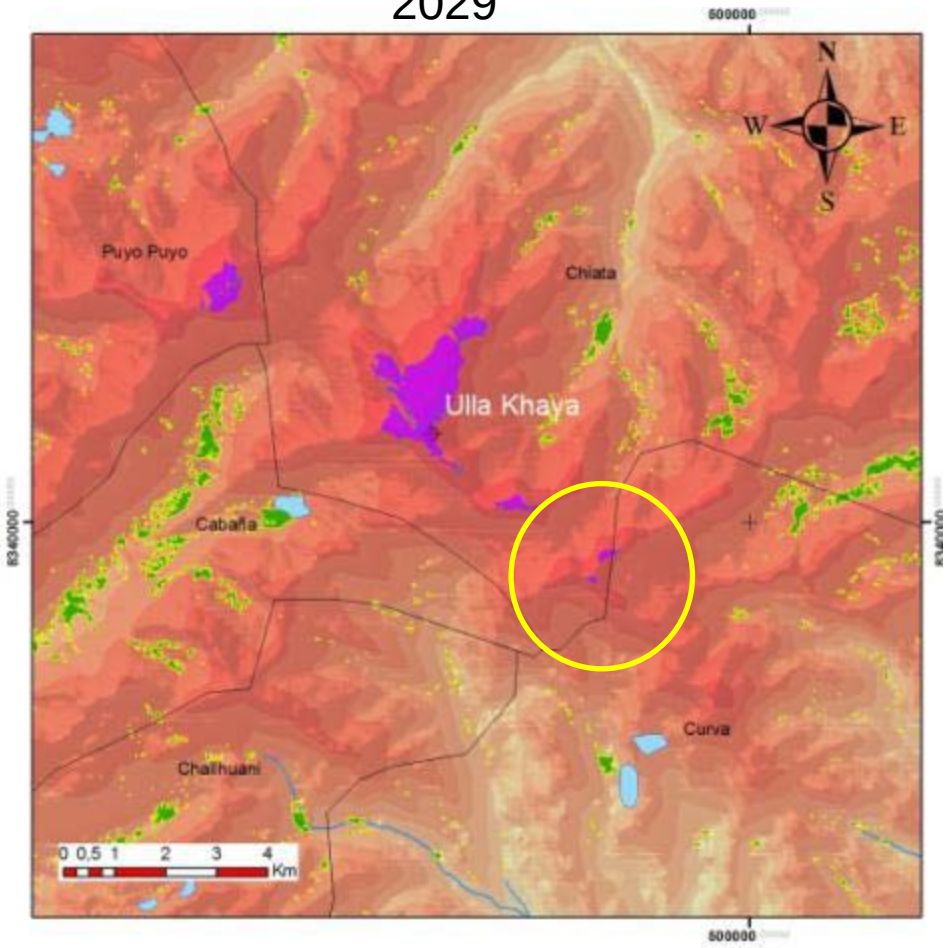
The mountains **have a personality** "Machulas" What will happen when the Akamani (glacier) that plays an important role in the culture Kallawaya disappear?

Glacier retreat projection

2009



2029



The projections of the disappearance of glaciers in Apolobamba ANMIN show us that the future is bleak

Fuente: Tarquino, 2011

Discussion & Conclusions

The glacial lakes are bodies of water located in upland areas and **represent high risk** to the local communities.

We need to think about what is the rol of Municipalities to take action.

Discussion & Conclusions

A major conflict today is the management and **access to water by communities**, although this aspect is an issue that works in national policies at local levels is still poorly

Discussion & Conclusions

Climate change has **transcended beyond the natural limits**, as seen this has serious **implications for social, cultural and economic communities** and urban populations of insurance.

The role of protected areas is key in **establishing databases and information**, because they have communication and access to first-hand information to assess the impact of climate change on rural and indigenous communities.

Discussion & Conclusions

While the events in which they develop are important socialization activities should focus on the identification of **adaptation measures** to climate change and are cultural processes, biophysical or socio-economic.

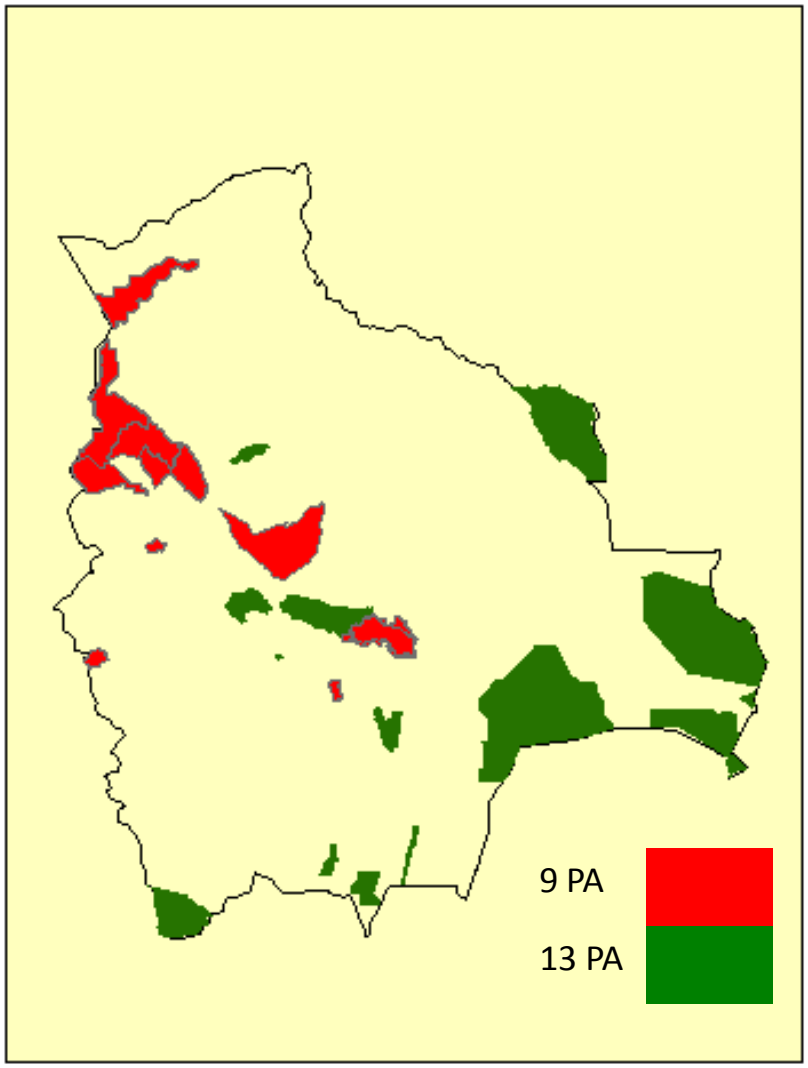
The role of research is key in **generating knowledge about climate change and conservation**. Aware that in this sense the Apolobamba ANMIN generated lines of research that allows researchers to focus on meeting the needs of the protected area and communities.

Discussion & Conclusions

Investigation turn the way, who develop the guide lines of research?

Temáticas prioritarias	Propuestas de investigación	Instituciones[1]
Lagunas	Calidad de agua en las lagunas del ANMIN Apolobamba	IE – UMSA, IRD
	Conflictos o derechos en el uso del agua en el ANMIN Apolobamba	Agua Sustentable
Lagunas, Glaciares y Bofedales	Valoración de los recursos hídricos en el ANMIN Apolobamba	CI
Lagunas glaciares	Desarrollo de sistemas de alerta temprana en las lagunas con un nivel alto de riesgo para las poblaciones en el ANMIN Apolobamba	Instituto de la Montaña
Glaciares	Riesgo del retroceso glaciar en el ANMIN Apolobamba	IE – UMSA
	Establecimiento de escenarios de planificación del efecto del retroceso glaciar y sus implicancias en la gestión del ANMIN Apolobamba	IE – UMSA

Discussion & Conclusions



The impact of that project is develop in the office of management of PA replication of that kind of process.

Gracias!!!

APOLOBAMBA

WILDLIFE CONSERVATION SOCIETY

SERNAP

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