

FOCUS AREA :

Pastoral Agro-ecosystems .

Puna , North-western Argentina

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Puna breeders: the woman is the shepherd



The Puna Shepherds

Introduction

We present the Puna pastoralists and their complex web of interactions and multifunctional services.

In Northwestern Argentina, the Puna is a plateau at 3,500 m o.s.l. dry and windy climate and high temperature amplitude, sparse vegetation and limited possibilities for agriculture.

Experts workshops



Our work

Vision and methodology

We introduce in our analysis of situation the "conceptual model, built through many workshops within AN2. We selected many relevant issues, and considered some indicators of "multifunctional services". We present here the first results of 4 workshops organized with local experts, Jujuy, Argentine.

Conceptual Model: The 4 dimensions

Production dimension

The main products here are meat and wool of *Lama glama* and ovine.

In the Jujuy Puna (NW Argentina) it is produced 60 t of Lama wool and ca. 200 t of ovine wool; and 330 t de Lama meat and 200 t of ovine meat.

The main destinations of meat are the local markets, and the wool is used for doing handicrafts (touristic value).

One very important service that the livestock gives to the nearby farmers is the "guano" (dung) for soil fertilization.



Multi stakeholders involved in the sustainable management of protected *Vicugna* (fine fibre).



New slaughters for de aboriginal Communities for best sanitary conditions and trade of Lama and ovine meat.

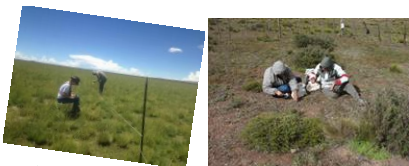
Local Development dimension

We identified the main components: Domestic/productive unit (shepherd family); as sector: the Puna producers; the Institutions (NGO; GO). We identified several main problems for this sector: productive infrastructure (land tenure, roads, slaughters, water accessibility, and communication); scarce market and prices information; scarce appropriate rules and laws for this type of production.

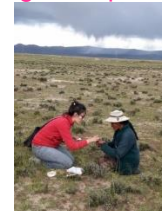
Ecosystem dimension

The main components of the conceptual model in this dimension are: the productive strategies and activities, the livestock's effects on soil quality, water circulation and storage, phytobiomass.

One important component identified is the shepherds', professional's and society's **perception** and knowledge of land degradation; deserts and livestock breeding.



Rescue and valorisation of pastoralist knowledge and practices.



Social dimension

The components are organized in three scales: the domestic unit (which is the productive unit); the community; and government institutions (schools, health services, etc.).

Indicators

Multifunctional ecosystem services indicators

Several different indicators should be taken in account. The main we discussed:

- **Ecosystem:** Biomass and Aerial Net Primary Production; Water storage and circulation, Soil chemical and structural quality
- **Production:** Meat, wool and "guano" productivity; natural grassland and pastures productivity.

- **Local Development:** Productive infrastructure; communication (internet, phones, radio, TV); Government actions and institutions for the pastoralist's activity; health care; rules and laws; information; stakeholders webs; employment; added value chains in situ or ex situ; technology innovation; specific research; markets; adequate rules; consumer's education; collective brands

- **Social:** migration (permanent or temporal emigration) ; mean shepherd's age; local knowledge system and management (the manner, flow and usefulness of transmitted knowledge); human rights; habitat; social services (school, health care; church, means of transport); community pacts; social webs and logics; sense of belonging.

Reflections and Perspectives

- We can describe indicators showing Multifunctional Services to the human being at different scales (local, regional, global).
- There are quantitative and qualitative services, we are building the way for estimating it.
- There are two types of indicators: a) the ones that show the services in different dimensions and scales; b) Very important are these that show the "resilience" of the pastoralism domain facing the climate change.
- So, the second type allows us to think on building possible future scenarios and identify the strong forces or components that can promote positive, negative or indifferent changes.