

Resilient Seed Systems

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UNIVERSITY
of GUELPH

SILVIA SARAPURA – ESCOBAR
SEDRO

IMPROVE LIFE.

Our Research Approach

- Transdisciplinary with a systems thinking perspective
 - Community-driven applied research
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- Peru – Andean Peasant communities (Aguapan, CGIAR, Ministry of Environment – SENARP and NGO Yanapai
 - Canada -





The Indigenous Cosmovision



Andean Farming Systems

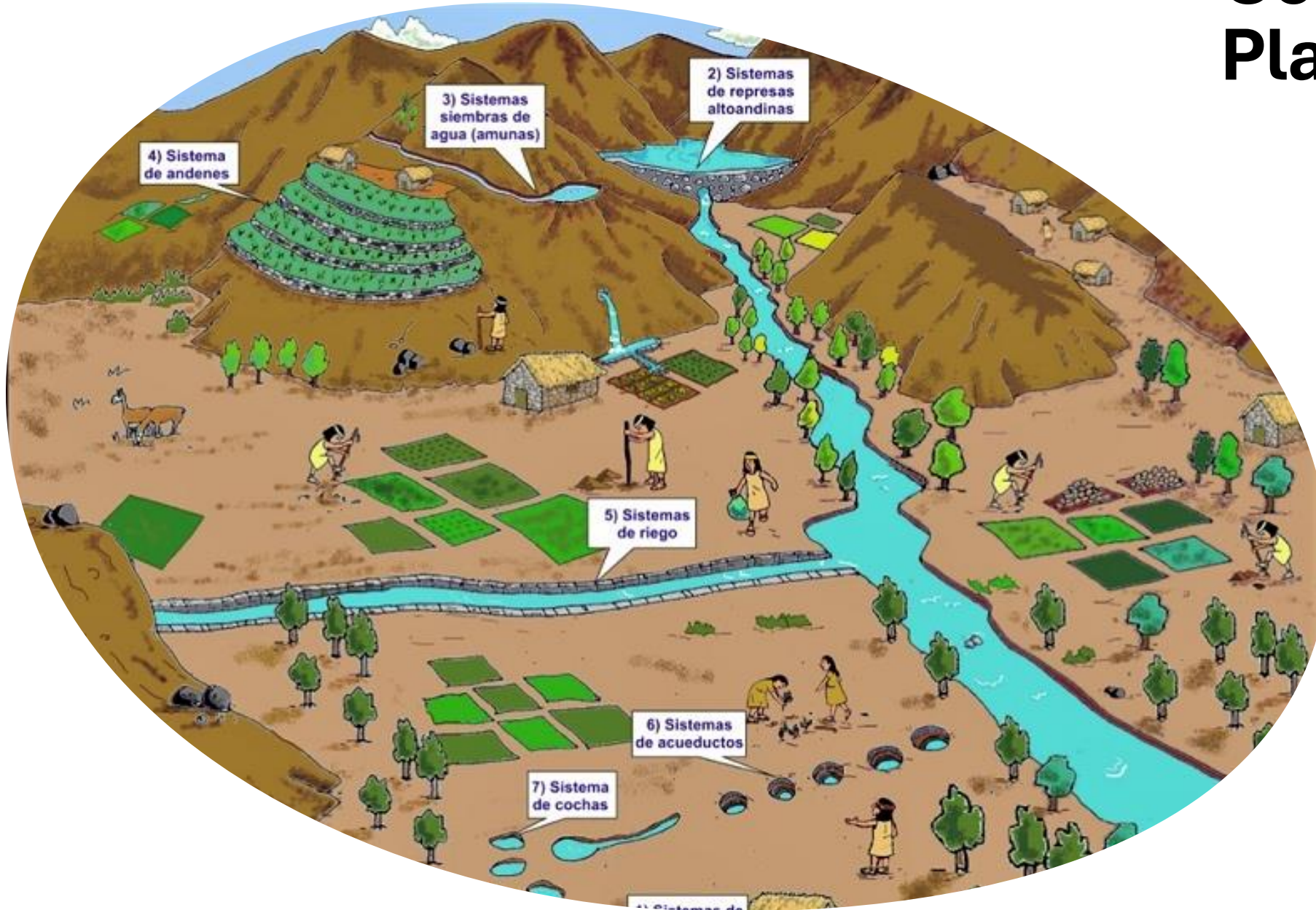
Andean Cosmovision

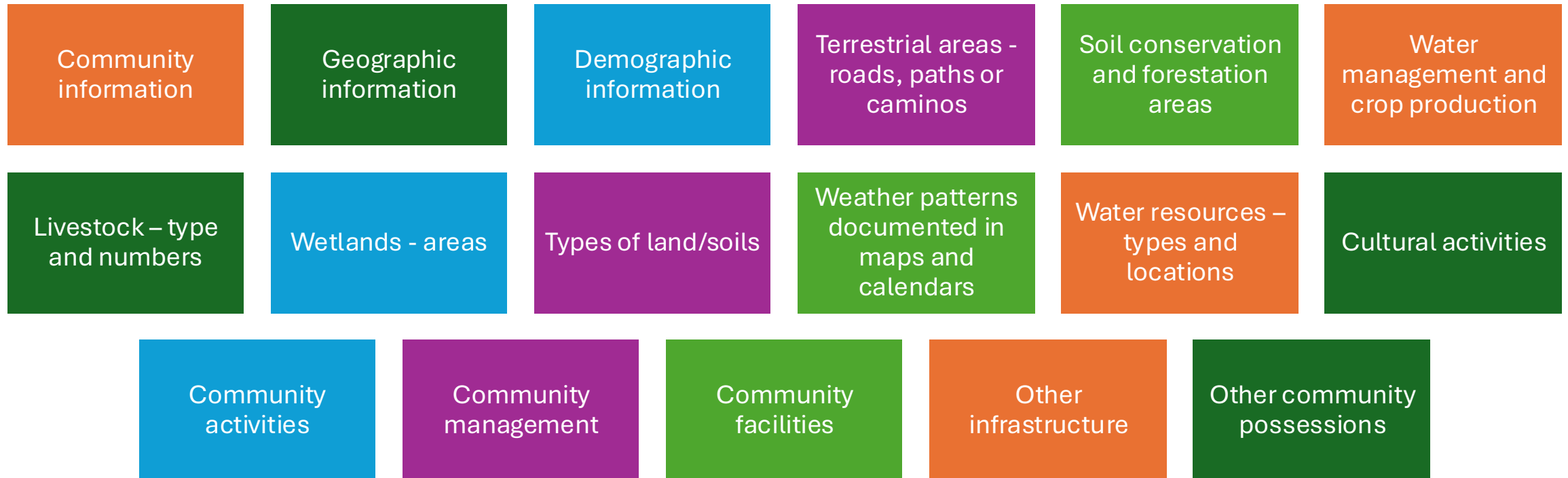
- Agro-centric principles
- Communal systems (*ayllu*, *ayni*, *minka*, bartering or *trueque*)

Indigenous Knowledge or '*saber campesino*'

- Sustainability
- Resiliency
- Biodiversity (plants, animals)

Communal Planning





Communal Zoning

Zones of production – animals and plants

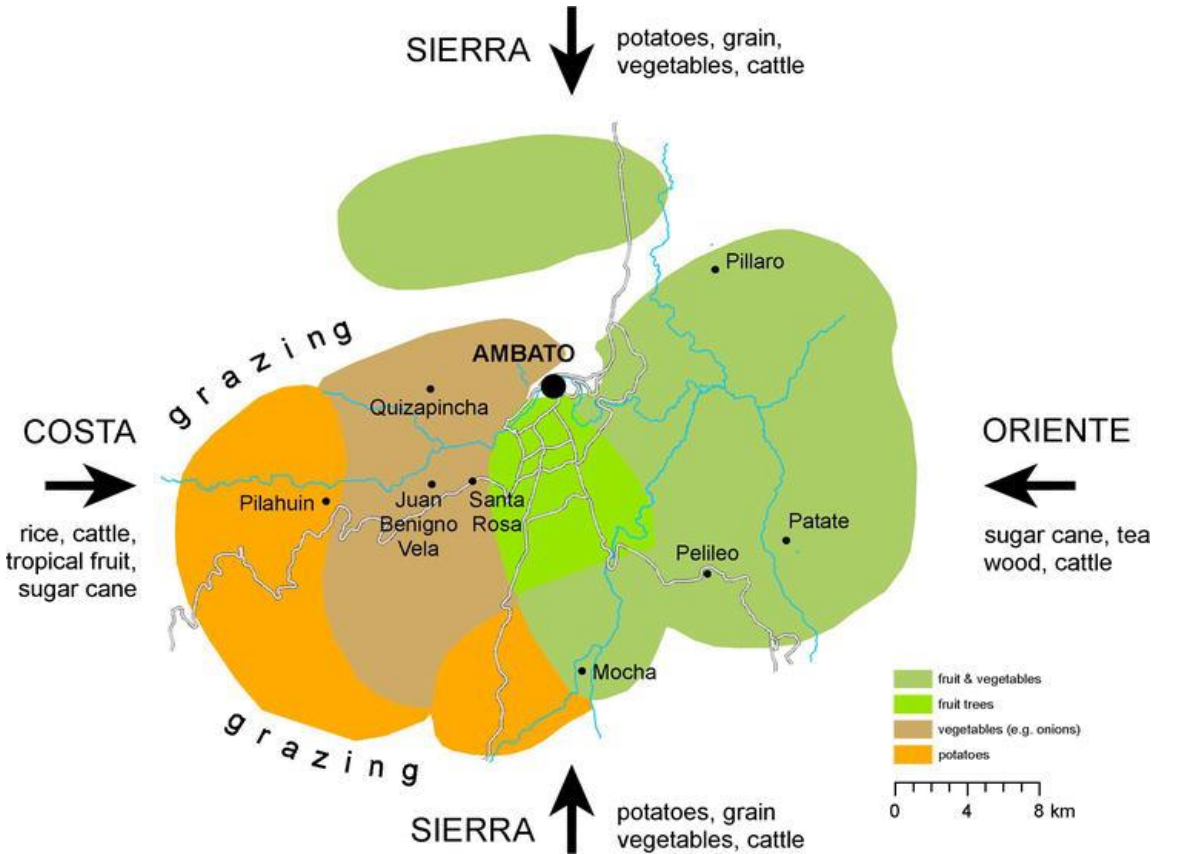
Zones of forestry production – introduced and native species

Zones of pastures – introduced (temporal) and native species (temporal and permanent)

Zones of conservation or natural protection

Sources of water

Sources of biodiversity



An aerial photograph of a mountainous region. The terrain is rugged, with steep slopes covered in dense green vegetation. A prominent, winding river or stream flows through the landscape, its path marked by a mix of green and brownish-grey. The river starts from the top left and curves towards the bottom right. The overall scene depicts a natural, undisturbed environment.

Planning for resource management in Andean Food Systems...



Land Use Planning

- Cultivation occurs on the plot or 'chacra.
- Cultural practices such as ayni, ayllu and minka are conducted on the plot.
- Family and community members share work and resources to maintain the genetic diversity as they control and minimize risks because of the ecological variability, water scarcity, and soil degradation.
- The use of plots is subject to rotation in *aynocas* (Laraos, Pazos and Racracalla) to maintain the fertility and quality of the soils as well to control insects and plagues.

Soil Conservation

- Tillage systems are used to minimize soil erosion and prevent losses (productivity, plagues control and water run-off).
 - the '*barbecho*' tillage system for lower altitudes in areas with water availability and conducted in the small planting season
 - the '*chacmeo*' minimal tillage system adapted to manual plow and carried out ahead of big planting season or '*campaña grande*'
 - the '*ocos*' carried out during the principal season. It is a minimal-tillage practice conducted in higher altitudes with the Chaquitacla.
 - terraces or *andenes* control drought. They reduce soil erosion and protect crops from frost. These promote the diversity of food species, diminish surface runoff and act as sponges by promoting water penetration and infiltration.





Water Management

- Water management is associated to soil management and the control of runoff produced by water coming from the rain, soil formation and agroclimatic sources.
- '*Acequias*', ditches or drains, or canals are built in streams and spring to spread the water to flood by gravity cultivated areas and natural pastures.
- '*Cochas*' store water in natural lagoons in the high areas so that they serve as watering holes.
- '*Waru warus*' pull land forming a bed surrounded by water. It produces a special microclimate that mitigate the effect of frost and protect the crops from frosting.
- '*Cochas*' and '*waru warus*' control overflow, retain soil, balance humidity, and raise temperatures at frosting nights.

Biodiversity Management

- Activities conducted through cultural and festive calendars
- Multi-cropping and cultivation of crops within small areas (melga) temporal rotation developed to manage risk as well as better utilize soil nutrients.
- Uses crops as insect repellents or live fences. It is the case of *mashua* (*Tropaeolum tuberosum*) or *verbena* (*v.peruviana*) used as nematicides.



Biodiversity Management

- Living indicators (plants, animals, physical phenomena, and stars) are indicators of behavior of time to predict climatic occurrences.
- Bartering, *trueque* and *compadrazgo* with communities at different locations and different altitudes for networking, seed exchange and diversified food.
- Communal seedbanks (*in-situ* conservation) serve as seed sources for replacing those seeds lost in the fields.



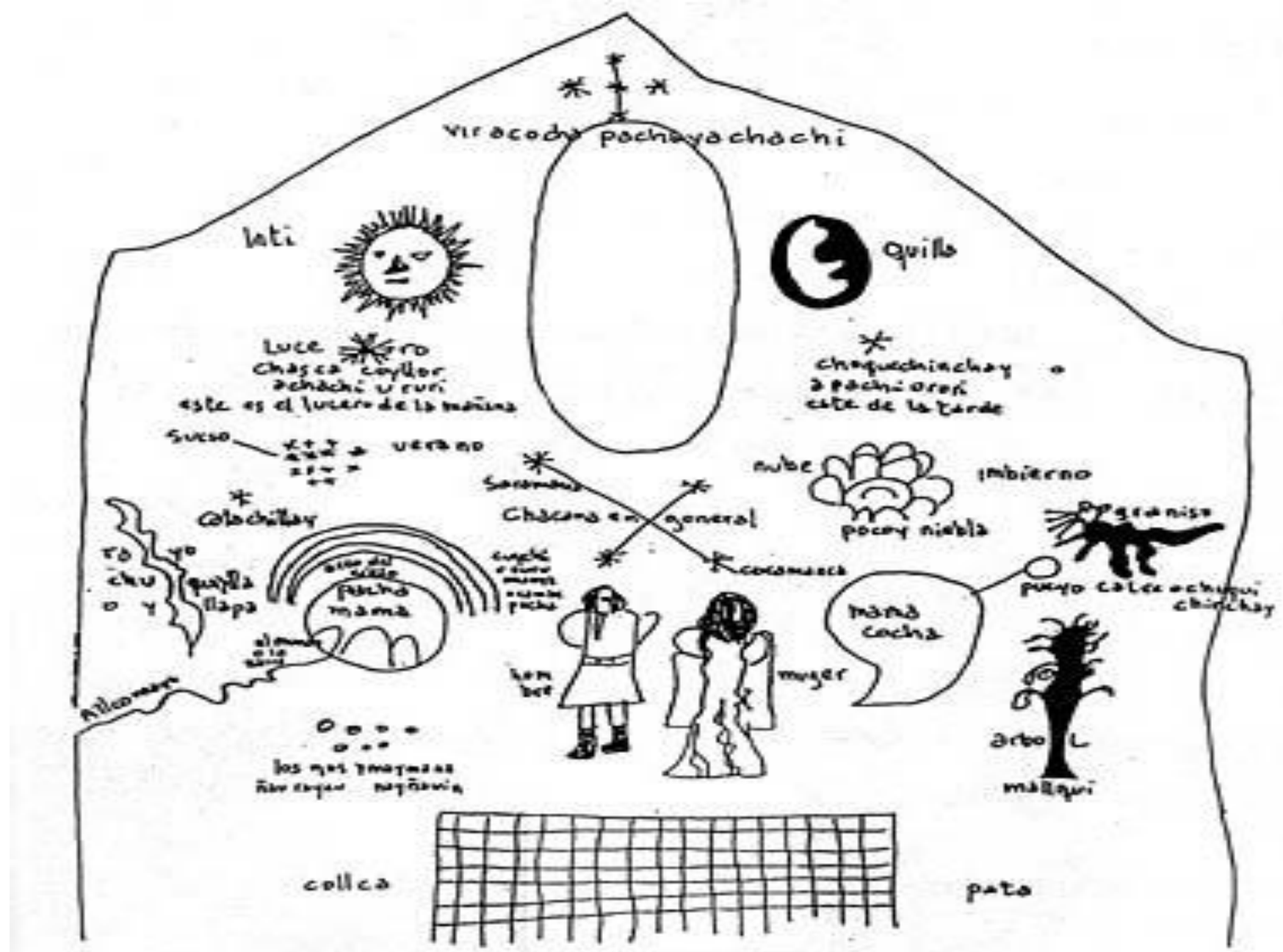
Cultural Practices

- Communities depend on these activities to do the work.
- *Ayllu* is the basic unit of the social organization in the community.
- *Ayni* is a reciprocal work system family among the members of the ayllu or community, destined to agricultural work, management of water structures and upkeep of biodiversity.
- *Minka* is another type of collaborative work. It synthesizes relationships of reciprocity, commitment, and complementarity.
- Communal activities are held in a festive atmosphere, accompanied by music, consumption of *chicha de jora* and coca leaves.



The Andean Cosmovision

[The Andean Weevil | Peru](#)

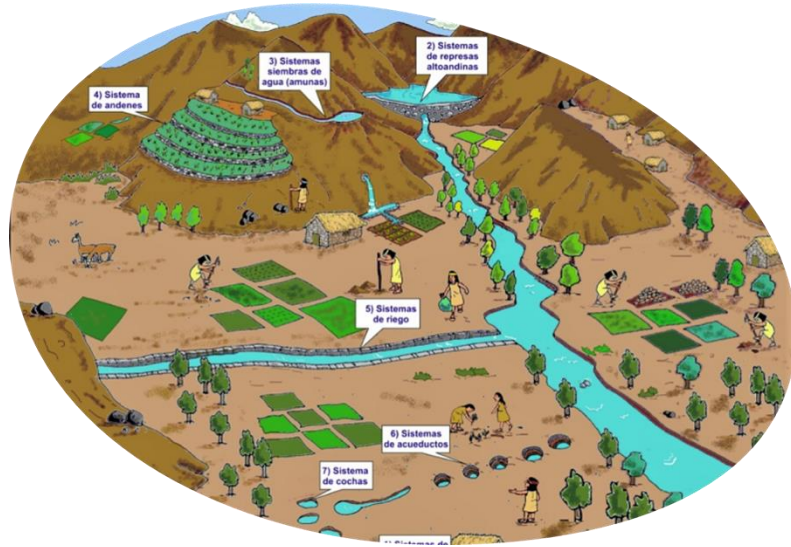




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- Reciprocity and buen vivir humans, animals and plants

Indigenous Knowledge or '*saber campesino*'

- Integrated and diverse (biodiversity)
- Reciprocity and *buen vivir* – health (physical and mental) – balance between body and mind

Research on Resilient Seed Systems

- Integrates people, animals, plants and nature
- Considers culture and social organization connection to local diversity and ecosystems
- Provides diverse, culturally appropriate, and accessible food in the face of disturbances and shocks





Thank you

