

ADAPTATION OF AGRICULTURAL SYSTEMS TO ADDRESS CLIMATE CHANGE IMPACTS:

CHINGAZA MASSIF, HIGH MOUNTAIN ECOSYSTEMS OF COLOMBIA

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Project Objectives

Project development objective: to support Colombia's efforts to define and implement specific pilot adaptation measures and policy options to meet the anticipated impacts from climate change.

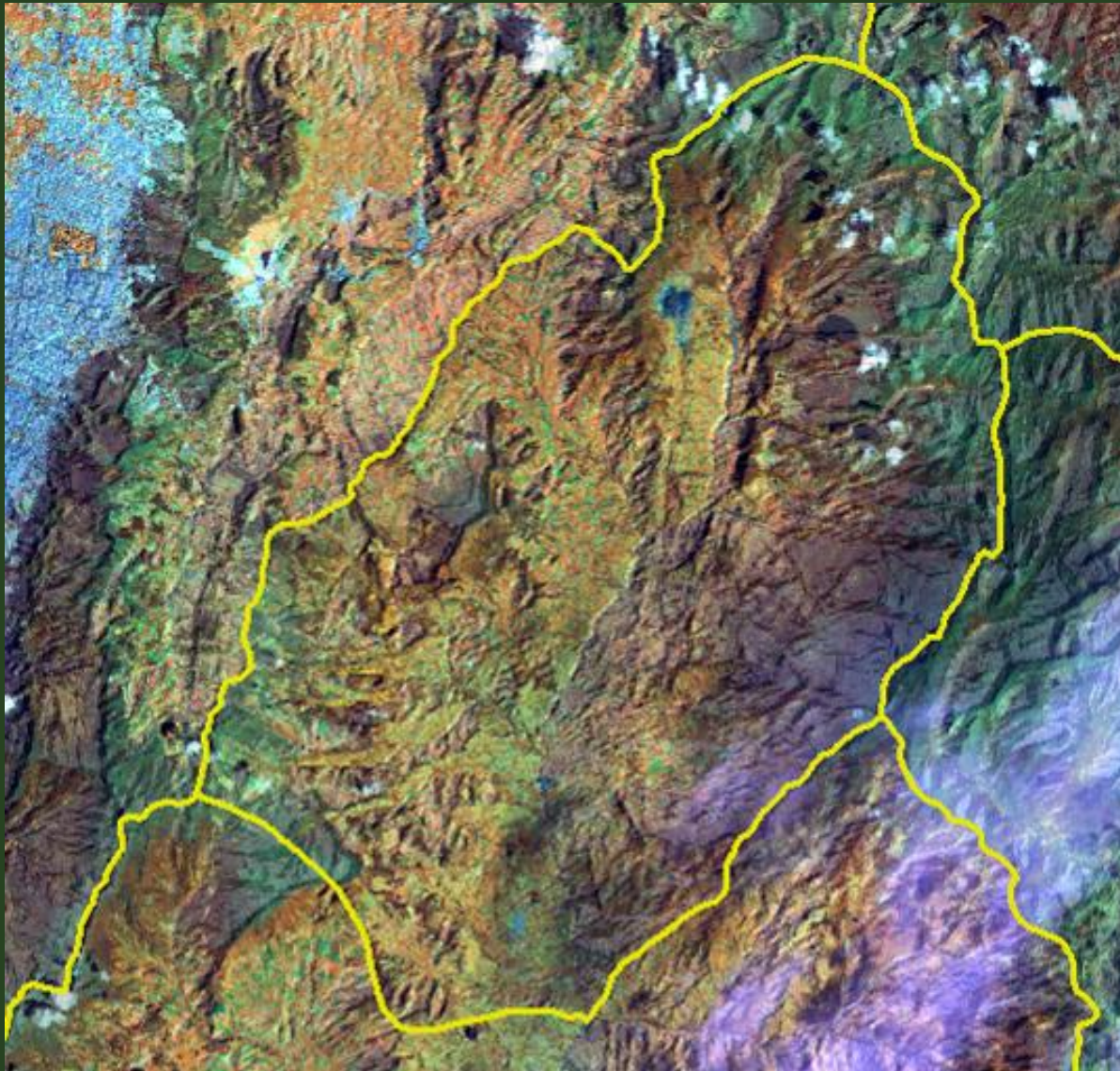
High Mountain Component: Increase resilience and reduce vulnerability of high mountain ecosystems, farming systems and communities as a consequence of climate variability and climate change.

Specific Objectives:

- Improved understanding of the behavior of high mountain tropical ecosystems.
- Exploration of suitable agroforestry systems that are resilient to climate change, promote environmental services and are financially viable.
- Mainstreaming climate change issues in planning processes in project areas.
- Developing an adaptation program that supports main ES of Chingaza.

STUDY AREA

Río Blanco Watershed



- Belongs to the Chingaza Massif (2nd largest Paramo in Colombia, and the Chingaza National Park).
- It is located 70 km from Bogota, covering an area of 40.528 ha (30% of the Massif).
- Provides water to a population of 8 million. It is used by the Water and Sewage Company in Bogotá.
- Population: 15.000 inhabitants.
- 1 National Park; 3 Regional Environmental Authorities; 3 municipalities, 1 Department.

Building resilience in agricultural farms

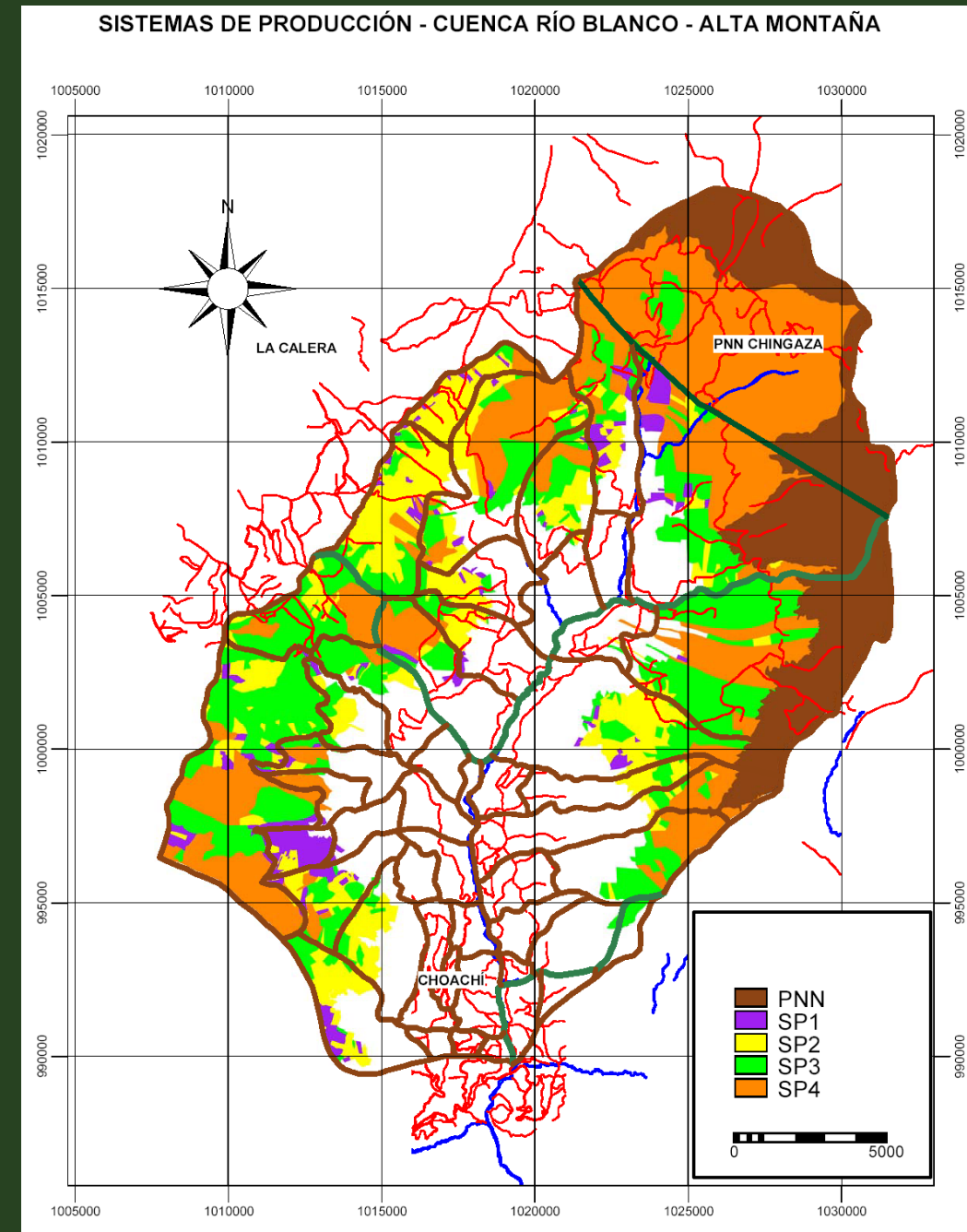
1. Farming Systems Analysis

a. Small farms (<2 ha); agriculture for local consumption, grazing in natural grasslands and transhumance; off farm activities . Limited environmental management. **4,44%.**

b. Small farms (1 a 3 ha), extensive grazing; cash crops: potatoes, maize and onion. Limited environmental management **16,85%.**

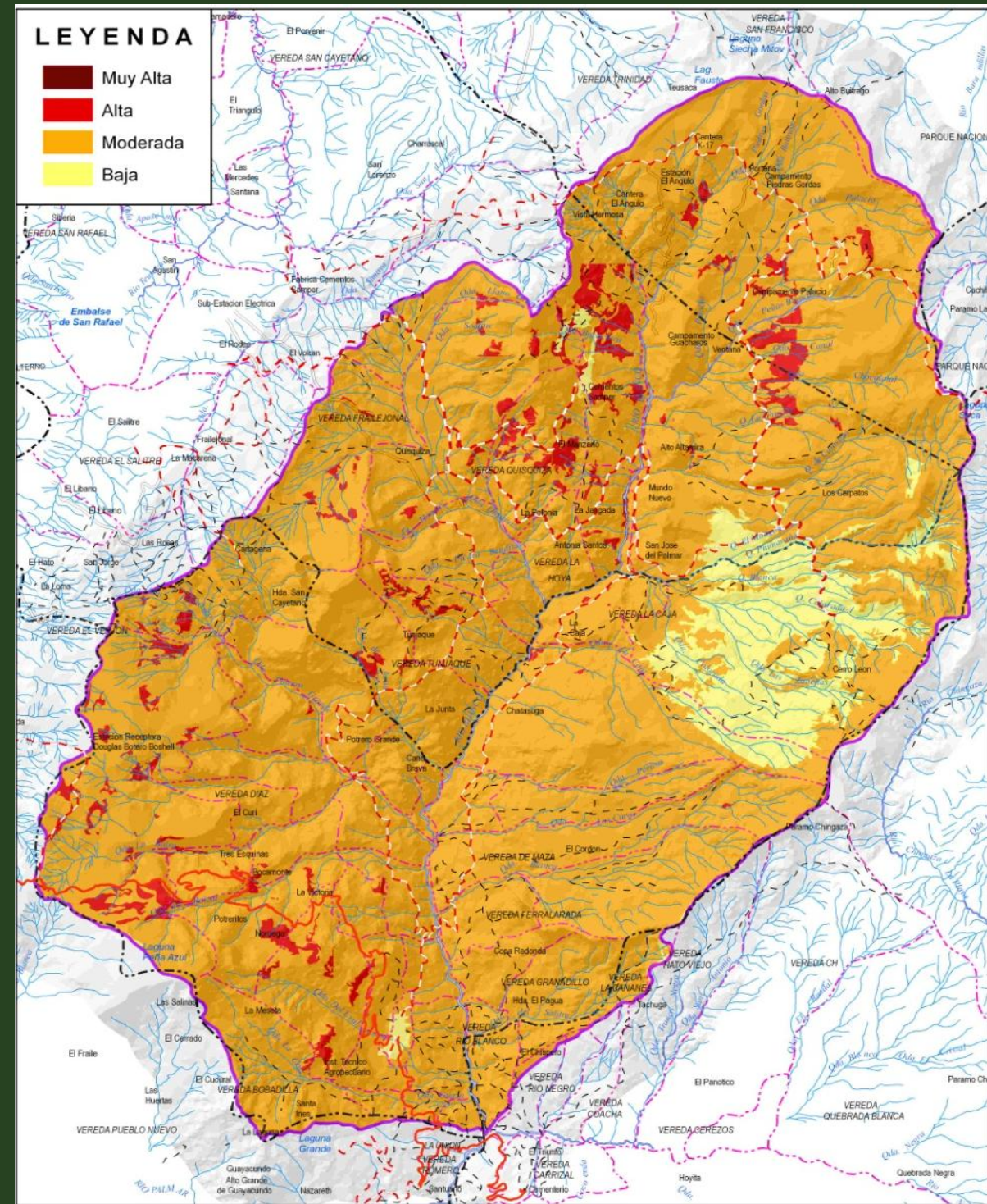
c. Medium size farms(3 y 20 ha): Extensive grazing for breeding, rearing and milk production, use of improved grasslands. Cash crops potatoes, maize and onions. Moderate environmental management. **25,54%.**

d. Large farms (> 20 ha) extensive grazing. Limited environmental management. **34,04%.**



2. Integrated Vulnerability Assessment:

- ✓ **Territory:** capacity to absorb impacts, due to climate change and other threats. (Including Social/Ecological and Economic Criteria).
- Exposure and sensitivity
- ✓ **Farming Systems:** Sensitivity, potential impacts and adaptive capacity.



3. Implementing adaptation actions:

- ✓ Selection of pilot areas for demonstration: high vulnerability and local interest.
- ✓ Identification of key actions for reducing vulnerability:

Actions at farm level:

- i. Agro ecological practices for soil and water management.
- ii. Agro forestry systems.
- iii. Participative ecological restoration.
- iv. Conservation of key areas for the maintenance of ecosystem services.

Support Actions implemented at community and municipal level:

- i. Land Use planning at municipal and farm level.
- ii. Capacity Building
- iii. Research

Actions developed at sub national and national level:

- i. Guidelines for farming systems adaptation in high mountain ecosystems.
- ii. Inputs for the 2nd National Communication and Climate Change Policy

4. Results:

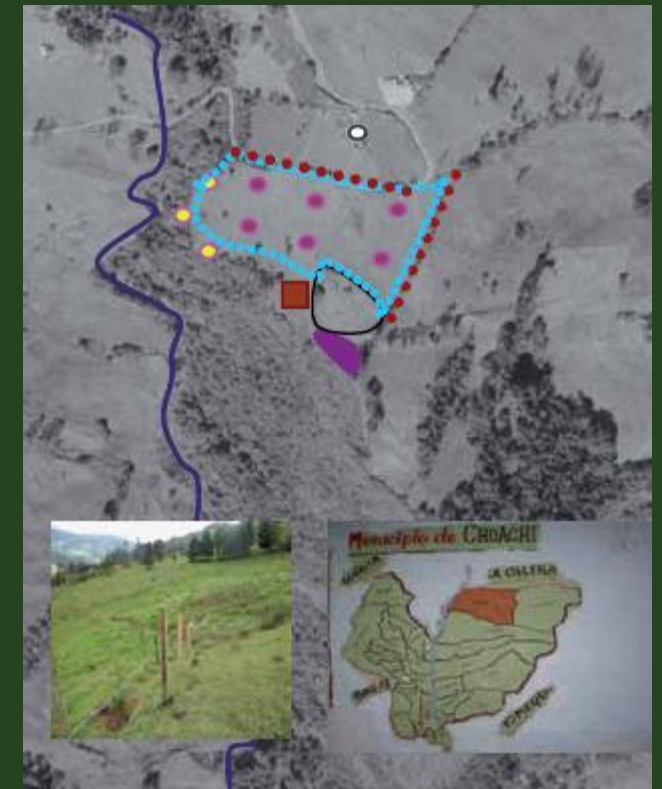
Integrated Farm Management:

- ✓ 90 pilot plots in agro forestry
- ✓ Establishment and improvement of 74 home gardens for propagation of native species and food crops.
- ✓ Agro ecological practices for soil conservation and water decontamination.
- ✓ 90 “Farm plans agreements” promoted and signed by local communities.

Technologies for efficient use of water: rainwater harvesting; drip irrigation; waste water treatment.

Technologies for soil management: isolation of eroded areas; implementation of soil conservation practices.

Strengthening food production chain and marketing.



ALTERNATIVAS DE RECONVERSIÓN GANADERA	
Semiestabulación	■
Cercas vivas diversificadas	● ● ● ●
Sistema silvopastoril	●
Enriquecimiento pradera
Bancos de proteína	■
Pastos de corte	○



Lessons Learned

Building resilience in Agro-ecosystems.

- Integrated vulnerability assessments are relevant.
- Vulnerability increases with non sustainable management practices.
- Agro ecosystems have to be analyzed in an integrated way, considering ecological, technological, economic, cultural and social aspects.
- Resilience should be aligned with food security and land use planning goals, at national, subnational and local level.
- Adaptation is a matter of social and economic development.
- The success of pilot adaptation projects in agro ecosystems systems, is a learning by doing and a long term process, and depends on research, the participation of local communities, the recognition of traditional and knowledge.
- Valuation of agro ecological processes have to be improved, including social, ecological and cultural costs.
- Institutions have to be strengthened and adapted in order to improve resilience.

Conservation South Africa (CSA) ecosystem based approaches to adaptation for livestock management in Namaqualand

- Existing pressures (over-grazing, soil erosion, invasive species, wetland degradation) will be exacerbated by climate change.
- Severe water shortages and land degradation are intensifying.
- High climate vulnerability for livestock dependent communities and the ecosystems they rely on.



Reducing vulnerability through ecosystem based approaches to adaptation

- producing a consolidated local vulnerability assessment on which action is based
- Restoration of key wetlands and degraded areas
- Improved/sustainable land management through stewardship approach
- Supporting local communities and government planning for inclusion of ecosystem services

Improving grazing land and making it more resilient to future climate changes.



Expected Adaptation Outcomes

- Improved water and grazing services with reduced vulnerability to future climate changes.
- Avoidance of maladaptation
- Enhanced inclusion of climate impacts and ecosystem services in local and regional planning
- Enhanced disaster risk reduction, sustainable development and adaptation planning and policy-making that integrates EbA



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