UNIVERSITÉ DE GENÈVE

ADAPTATION AT ALTITUDE
Taking Action in the Mountains

CONDESAN
Consorcio para el Desarrollo Sostenible de la Ecorregión Andina

Assessing the effectiveness and sustainability of mountain adaptation

Lessons from the Andean region

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Objectives:

- To evaluate the effectiveness and sustainability of climate adaptation solutions **as perceived by beneficiary communities.**
- To learn on the impacts the solutions have had and are continuing to have at the ground level.
- To identify the factors that have enabled or hindered the both effectiveness and sustainability.

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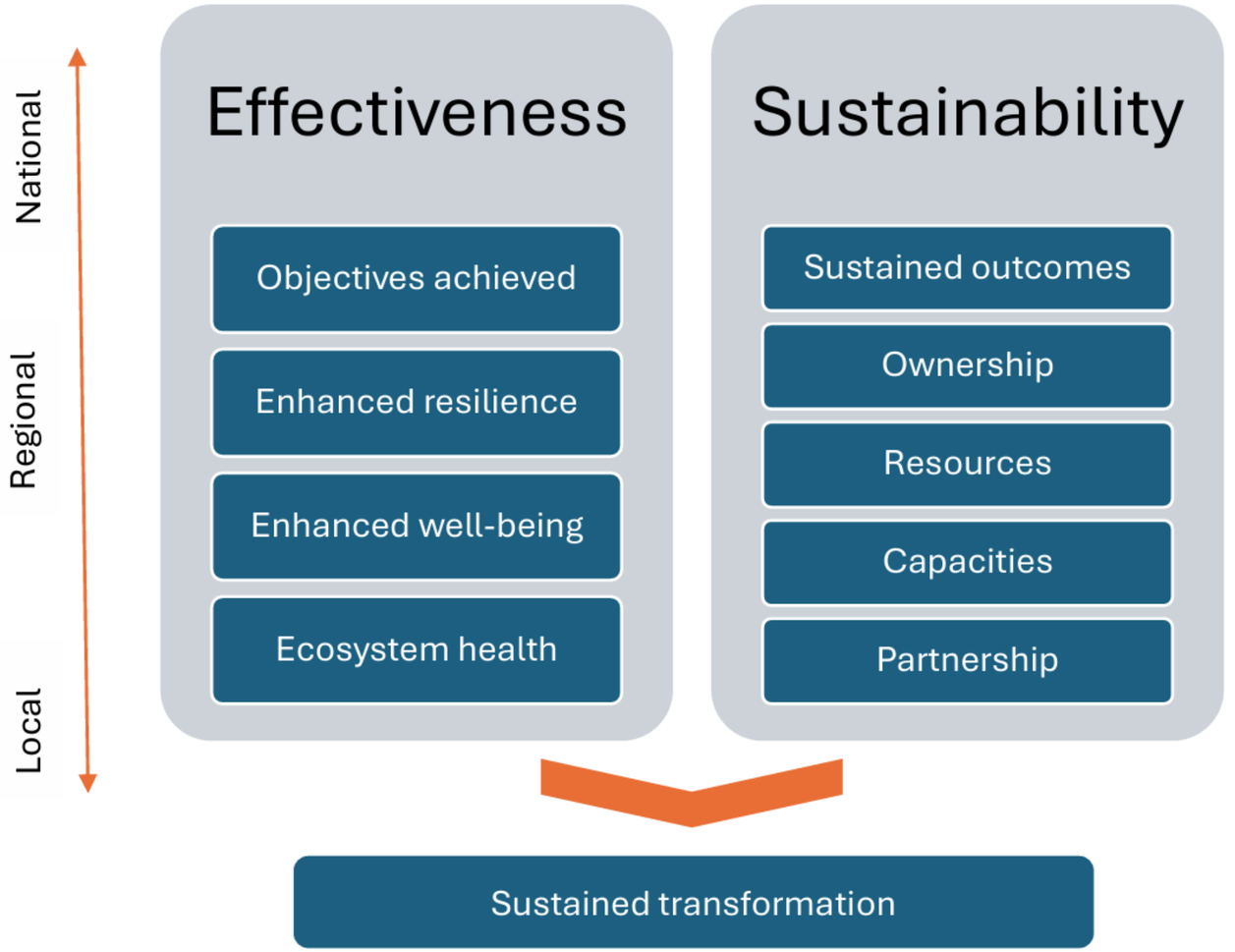
Methods:

- Design and implementation of evaluation framework.
- Semi-structured interviews (N=36).
- Document review.
- Field visits (Colombia and Argentina).

Conceptual framework



Case 1: Argentina

Wetland management and conservation in the Laguna de los Pozuelos Biosphere Reserve

Implementation period: Since 2017. Led by Wetlands International.

Context: overgrazing, water diversion, drought, and mining pressure degrading high-Andean wetlands (vegas and bofedales) at 3,500 m.

Solution: Development of a grazing management plan and a wetland management and restoration plan, community-led wetland restoration works, installation of solar pumps, training on best practices.

Effectiveness

- 84+ ha of high Andean wetlands restored; 20,000 ha under improved grazing practices
- Reliable water access for ~180 Kolla families
- Women's participation strengthened
- Vicuña population recovering

Sustainability

- Inter-institutional collaboration
- Use of ancestral techniques (azud) built deep trust and local ownership
- Knowledge embedded via Indigenous governance and training manuals

Case 2: Ecuador

Greenhouse cultivation and training in best agricultural practices in Cuyuja and Papallacta

Implementation period: 2020 - 2022

Implementers: AICCA project

Context: Open-field farming impossible due to frost and intense rainfall. Expansion of grazing threatening buffer zones of the Cayambe-Coca and Antisana national parks.

Solution: 42 family greenhouses, training in good agricultural practices

Effectiveness

- Improved food security and income for ~1,600 people
- Empowered women
- Improved governance relations
- Reduced grazing pressure on páramos
- Creation of a savings fund

Sustainability

- Communities and local governments (GADs) now independently replicating greenhouses
- Most greenhouses still active and in good conditions 3 years after the project’s closure
- Integrated into parish schools and planning

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Key lessons

Conventional evaluations risk overestimating sustainability if they do not track post-project continuity.

Solutions inserted into favorable social, institutional, and political environments were systematically more effective.

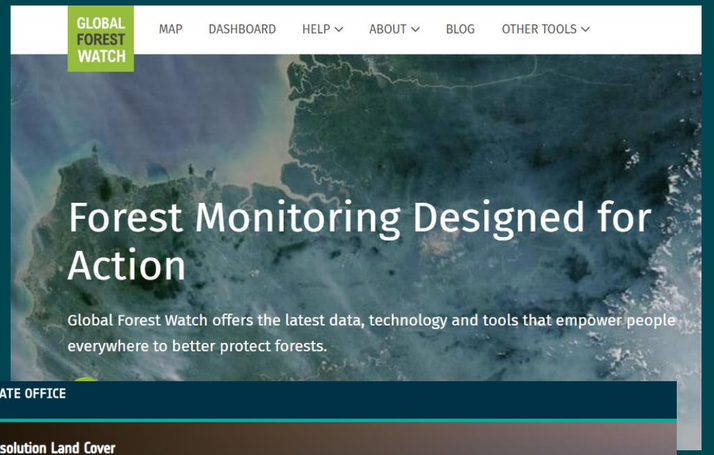
Ownership requires demonstrable, tangible benefits in the short to medium term. Abstract or long-term benefits alone do not generate sustained community commitment.

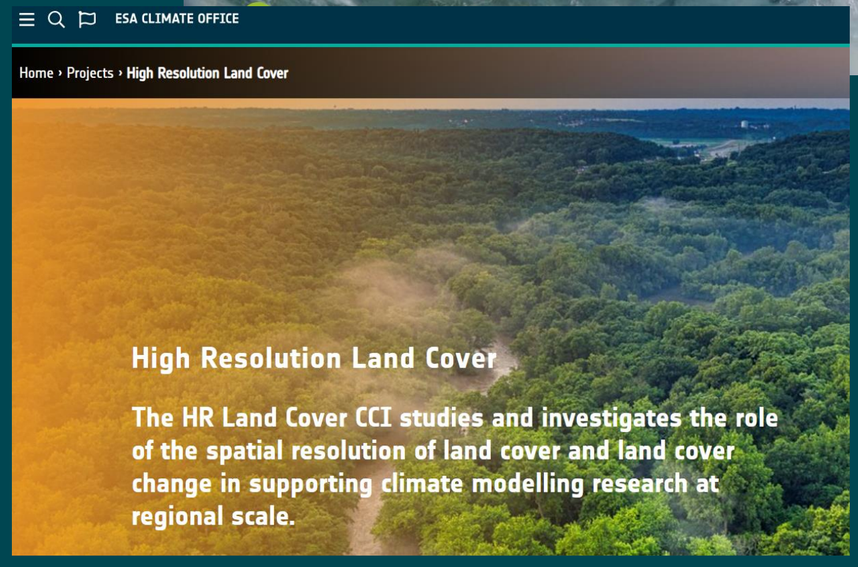
Post-project handover must be planned from the start.

How can Earth Observation (EO) support similar efforts?

EO offers a cost-effective, retrospective and prospective layer that can support and transform the evaluation of solutions, particularly post-implementation.

- Measuring baseline conditions before implementation to facilitate later attribution of outcomes
- Monitoring changes over time
- Detecting indirect and unintended impacts
- Complimenting local and indigenous knowledge





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Three layers working together

Community perception

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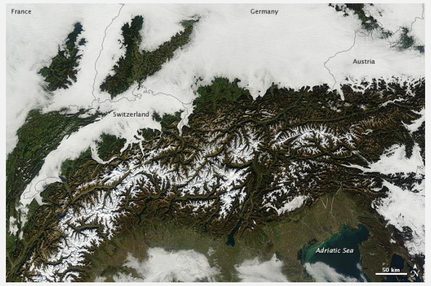

EO-based biophysical indicators

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Light in-situ validation

Thank You

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