BioOne COMPLETE

Participatory Planning for Biodiversity Conservation in the High Tropical Andes: Are Farmers Interested?

Authors: Llambí, Luís D., Smith, Julia K., Pereira, Nory, Pereira, Ana Carlota, Valero, Francis, et al.

Source: Mountain Research and Development, 25(3) : 200-205

Published By: International Mountain Society

URL: https://doi.org/10.1659/0276-4741(2005)025[0200:PPFBCI]2.0.CO;2

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://complete.bioone.org/journals/Mountain-Research-and-Development on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Mountain Research and Development Vol 25 No 3 Aug 2005: 200–205

Luís D. Llambí, Julia K. Smith, Nory Pereira, Ana Carlota Pereira, Francis Valero, Maximina Monasterio, and María Vicenta Dávila

Participatory Planning for Biodiversity Conservation in the High Tropical Andes: Are Farmers Interested?



The success of participatory conservation projects depends greatly on the interest shown by the local population and on the strategies used to incorporate all stakeholders from the initial stages. In the highly diverse region of the tropical Andean páramos*, threats to ecosystem integrity come mainly from agriculture and cattle grazing. Approaches to biodiversity conservation have often been based on top-down regulations imposed by government agencies. The implementation of an alternative approach, incorporating local communities in the design of action plans for conservation, was the central objective during the design phase of the Andean Páramo Project. These plans will be executed in a network of key pilot sites along the South American* páramos*. Here we report on experience at the two Venezuelan sites, where the design process involved a series of participatory workshops. The multidisciplinary nature of the facilitation team was essential in addressing the complex links between biodiversity conservation, land use strategies, and human welfare. The success of the approach was associated with the local population's great interest in and detailed knowledge of the ecosystem, as well as with our emphasis on empowerment through incorporating local knowledge and views as the basis for planning.*

Farmers' interest in biodiversity conservation

Active participation of local inhabitants is increasingly recognized as a key strategy for the success of any well-designed biodiversity conservation project. However, the use of participatory strategies will only be as successful as the interest shown by local communities in biodiversity issues. This interest will probably depend on the direct and indirect benefits people feel that they derive from biodiversity, their knowledge of the ecosystem, and their value systems in terms of their relationship with nature.

In the *páramos* of the tropical Andes of Venezuela (above 3000 m; Figure 1) the local population consists of farmers established there relatively recently (in the last 300 years). Threats to biodiversity derive mainly from potato agriculture and extensive cattle grazing, which are the basis of the local rural economy. The agricultural systems vary along a gradient from semi-traditional fallow systems in more isolated



FIGURE 1 *Páramo* in the Cordillera de Mérida, with the characteristic yellow flowering rosettes of the *Espeletia* genus. Plant diversity and endemism in these environments are among the highest of the alpine systems of the world. These areas constitute grazing land for cattle and water sources for agriculture in the adjacent valleys. (Photo by J.K. Smith)

Downloaded From: https://complete.bioone.org/journals/Mountain-Research-and-Development on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

FIGURE 2 Farmers planting potatoes at 3100 m with the help of plows driven by oxen. (Photo by J.K. Smith)



areas to market-oriented intensive agriculture highly dependent on agrochemicals and irrigation.

In the fallow agricultural areas, farmers make direct use of *páramo* biodiversity in a variety of ways: plants for medicinal and religious use, hunting, etc. Moreover, they benefit indirectly from the regeneration of *páramo* vegetation in fallow fields (which allows partial restoration of soil fertility). Hence, they have more direct contact with the functioning and diversity of the *páramo* ecosystem than most farmers who use the land for intensive potato cultivation. In addition, both traditional and intensive farmers depend on grazing areas in the *páramos* (especially high wetlands), as plowing is done with oxen owing to the steep slopes (Figure 2).

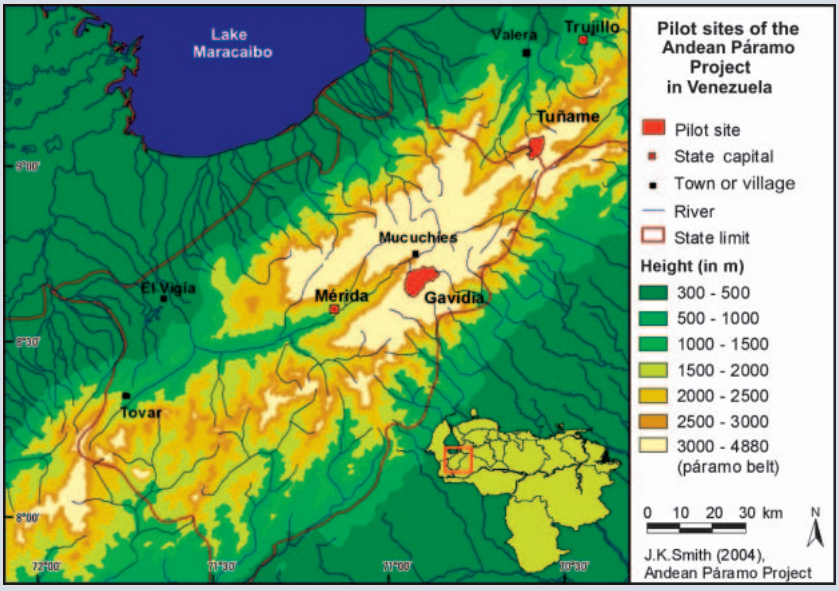
The great dependence of intensive agriculture on irrigation water that drains from the *páramos* has increased farmers' awareness of the link between ecosystem integrity and human welfare. Interestingly, there has been a recent boom in community-based environmental movements, led in many cases by women. These include initiatives for the conservation of headwaters in the *páramo* and capacity building for sustainable agriculture.

The Andean Páramo Project experience in Venezuela

The Andean Páramo Project (Conservation of Biodiversity in the *Páramos* of the Northern and Central Andes) is a regional initiative financed by the Global Environment Facility, implemented by UNEP, and regionally coordinated by the Consortium for Sustainable Development of the Andean Ecoregion (CONDESAN). The project involves the countries with *páramo* within the Andean community of nations: Venezuela, Colombia, Ecuador, and Peru. Its goals are biodiversity conservation and safeguarding the ecological functions of the *páramos*, while improving the welfare of its inhabitants. The central component of the design phase (PDF-B) was the development of participatory conservation plans in a network of key pilot sites in the 4 countries. Here, we summarize experience with participation of the local populations of the 2 Venezuelan sites (Figure 3) in the design of conservation plans. These plans will serve as blueprints for action during project implementation (6 years).

Multidisciplinarity during the design process took place at 2 levels. On the one hand, the composition of the facilitation team, coming from diverse backgrounds including ecology, geography, rural development, and social medicine, was essential in addressing the complex links between biodiversity conservation, land use strate-

FIGURE 3 Location of the project pilot sites of the Andean *Páramo* Project in the Cordillera de Mérida, Venezuela. (Map by J.K. Smith)



Downloaded From: https://complete.bioone.org/journals/Mountain-Research-and-Development on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use



FIGURE 4 Discussion group during the problem analysis workshop in Gavidia. A community leader from the Women's Weavers Organization is arguing for the importance of increasing sheep numbers in the valley. (Photo by J.K. Smith)

gies, and human welfare. On the other hand, the planning process incorporated the views of numerous stakeholders, including community-based organizations and regional government agencies (municipalities, National Park authorities, Ministries of Environment and Agriculture, etc).

The strategy for farmers' involvement in conservation planning

Project presentation: a key starting point

The initial presentation of the project to the communities was crucial in evaluating the level of interest and establishing agreements for further work. The great diversity and endemism found in the Venezuelan *páramos*, its limited geographical extension, and the uniqueness of the ecosystem were emphasized. By putting the local *páramos* in a global context a sense of ownership and stewardship in the participants was created: farmers indicated they had not previously realized that they were guardians of an ecosystem of international significance.

Building alliances

A key to the success of the design process was the establishment of alliances with governmental and non-governmental organizations active in each area. This avoided replication of efforts and provided already trusted local counterparts with effective communication between the local communities and project personnel.

Developing a shared vision

In workshops, a shared vision for the future of the community was constructed by all its members. Children participated by drawing pictures of their dream community and presenting them to their parents. This was an important experience, as the adults realized that their children have their own views of the future, highlighted in terms of their right to good education, modern technologies, and a clean environment.

Problem analysis

In order to focus problem analysis on the overall objectives of the project, a simple diagram was discussed showing the close relationship between management practices, people's welfare, and *páramo* conservation. This prevented discussion of problems outside the scope of the project (eg access to public services) that could create false expectations. Initial brainstorming was followed by prioritization and establishment of consensus (Figure 4). At both pilot sites, the process resulted in identification of the same core problems: degradation and destruction of the *páramo* ecosystem, pollution from various sources (agrochemicals, wastewater, etc), and the lack of effective coordination and participation by the community. In Gavidia the environmental impact of tourism was also included, reflecting its increasing importance as a tourist destination. For these main problems, different groups developed problem analysis trees identifying underlying causes and consequences.

Baseline establishment and participatory mapping

A detailed baseline study of land use, hydrology, natural vegetation, fauna, socioeconomic conditions, services, and infrastructure was established. Participatory mapping (analysis of air photographs and satellite images) was a valu-

Downloaded From: https://complete.bioone.org/journals/Mountain-Research-and-Development on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

able tool for obtaining farmers' views of land use management, especially for aspects difficult to characterize, such as cattle grazing patterns. The population at the site where semi-traditional agriculture is practiced showed a more detailed knowledge of their environment than inhabitants at the other pilot site, by clearly identifying all glacial lagoons, water sources, grazing areas, etc. Our socioeconomic analysis showed high levels of poverty, which were reflected in low income and poor housing and sanitary conditions. This emphasized the importance of combining project interventions for conservation with actions for improving living conditions.

Technical evaluation of the action plan

On the basis of all the information gathered, action plans were designed (including implementation strategies and stakeholder responsibilities) and evaluated in technical roundtable discussions. These workshops incorporated representatives of numerous regional governmental and non-governmental organizations (eg National Park Agency, Ministries of the Environment and Agriculture, University) and were an exceptional forum to discuss strategies for management and conservation based on the detailed information provided by the two communities. In particular, our work in Gavidia (located within the Sierra Nevada National Park; Figure 5) constitutes a pioneer project for the implementation of a local plan for conservation with community participation within protected areas in the Venezuelan *páramos*. Moreover, discussions have already contributed to a constructive flow of information and the strengthening of relationships between farmers and regional authorities, which in the case of the National Park have been conflictive in the past.

Proposed lines of action: results of the participatory process

The main lines of work proposed in the action plans are briefly summarized below.

- *Mitigating degradation and destruction of the* páramo: given that the main threat to conservation at both sites is the advance of the agricultural frontier (Figure 6), the main actions will be



FIGURE 5 Pilot site in Gavidia. Fallow agriculture is practiced to cultivate potatoes. The agricultural zone occupies 19% of the total area (6030 ha) between 3200–4200 m. The 400 inhabitants also depend on extensive cattle raising; some derive their income from tourism. The dominant vegetation is a rosette–shrubland *páramo*. (Photo by J.K. Smith)

Downloaded Fr
Terms of Use:

FIGURE 6 Pilot site in Tuñame. The production system involves a gradient from intensive agriculture in the low areas (2800 m) to fallow agriculture at higher altitudes (up to 3600 m). Potato cropping is accompanied by carrots and other vegetables. The agricultural zone occupies 48% of the total area (2526 ha). With 975 inhabitants, population density is greater than at the other site. The dominant vegetation is a rosette *páramo*. (Photo by J.K. Smith)



directed towards the establishment of local land-ordering and regulation agreements with all relevant stakeholders. In addition, programs to increase agricultural productivity and promote sustainable alternatives will be implemented. Participatory research on the impact of cattle grazing will be associated with an integrated program to increase local capacities for sustainable management (eg supplementary forage in the agricultural belt, controlled grazing in high wetland areas).

- *Controlling pollution:* actions will be mainly directed towards the control and efficient use of agrochemicals, which pose important health hazards to the population and are the main sources of pollution. This will involve capacity building for appropriate use as well as establishment of programs focusing on ecological agricultural techniques (eg integrated pest management).
- *Strengthening of local organizations for effective participation:* this will be achieved primarily through identification and training of local leaders, emphasizing the environmental dimensions of leadership. In addition, efforts will be directed towards local capacity building for the establishment and operation of effective local organizations. Implementation of the project should also provide an opportunity to coordinate efforts concerning environmental issues.
- *Controlling the environmental impacts of tourism:* the Gavidia community indicated that the increase in tourism has significantly increased litter and degradation of *páramo* areas. The action plan proposes controlling the impact of tourism through a joint community–National Park program. This involves strengthening the local environmental brigade, training in National Park regulations and tourist management, environmental education, and the establishment of an ecological information center.

Lessons learned and future challenges

The process outlined above was effective in achieving the active participation of local farmers, at both the semi-traditional and intensive agriculture sites. Was this because farmers were already interested, or because of the strategies used? Both explanations are valid. On the one hand, several of the strategies implemented proved successful: a) empowerment through incorporating local knowledge and views as the basis for planning (instead of having environmental regulations imposed from outside); b) active involvement of local GOs and NGOs from the initial stages; c) participation of all age groups and both sexes (Figure 7); d) use of participatory strategies for detailed problem identification and characterization (including participatory mapping);

Downloaded From: https://complete.bioone.org/journals/Mountain-Research-and-Development on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

FIGURE 7 Children drawing their dream community in Tuñame during the problem analysis workshop. (Photo by J.K. Smith)



e) turning the design process into a capacity building exercise, in which the community acquires useful tools for strategic planning.

On the other hand, farmers were already interested. It was obvious that they are proud of their status as "*parameros*" (*páramo* dwellers) and have a detailed knowledge of the ecosystem. In addition, they clearly recognize the importance of *páramo* environmental services in sustaining the local economy.

However, active farmers' participation in planning is one thing, but their adoption of sustainable management alternatives and land use agreements is quite a different matter. This can only be achieved through an effective system of positive incentives, feasible alternatives, and institutional enforcement of regulations and agreements. The main challenge for the project implementation phase will be to establish programs and economic incentives to promote access to viable, ecologically sound, efficient, and cost-effective technologies—something highlighted by farmers throughout the process. In addition, preventing the violation of land use agreements will necessarily require strengthening the institutional capacity of community-based environmental organizations.

AUTHORS

Luís D. Llambí, Julia K. Smith, Maximina Monasterio
Instituto de Ciencias Ambientales y Ecológicas (ICAE), Facultad de Ciencias, Universidad de los Andes (ULA), Mérida 5101, Venezuela.
llambi@ula.ve; julia@ula.ve; maximina@intercable.net.ve

Luís Llambí is an ecologist specializing in tropical mountain ecosystems. His work has concentrated on vegetation and soil restoration dynamics in the high Andes. He was the General Coordinator in Venezuela of the Andean Páramo Project (GEF–UNEP) during its design phase (PDF-B).

Julia Smith is a geographer specializing in GIS and remote sensing applied to land use change and its socioeconomic drivers in the tropical Andes. She was the pilot site coordinator of the Andean Páramo Project in Venezuela.

Maximina Monasterio is an ecologist with a long-standing trajectory in tropical mountain ecosystems. She is Professor in the Tropical Ecology Postgraduate Program at ULA and was the Director of the Andean Páramo Project in Venezuela.

Nory Pereira
Centro de Investigaciones de la Vivienda, Facultad de Arquitectura y Arte, Universidad de los Andes (ULA), Mérida 5101, Venezuela.
norypc@ula.ve

Nory Pereira is an architect specializing in urban planning and rural development. She is the Coordinator of the Housing Research Center at ULA. She coordinated research on social aspects at the pilot sites.

Ana Carlota Pereira, Francis Valero
Departamento de Medicina Preventiva y Social, Facultad de Medicina, Universidad de los Andes (ULA), Mérida 5101, Venezuela.
carlotapc@cantv.net; .....

Ana Pereira is a medical doctor specializing in epidemiology, public health, and social medicine. She is Coordinator of the Public Health Postgraduate Program at ULA. She coordinated the participatory workshops and participated in social research.

Francis Valero is a medical doctor specializing in public health, demograph, and social medicine. She is the Head of the Department of Social and Preventive Medicine at ULA. She participated in planning and research on socials aspects at the pilot sites.

Maria Vicenta Dávila
Centro de Educación Popular para el Desarrollo Integral de la Familia, Casa Mucusutuy. Avenida Independencia, Mucuchíes, Edo. Mérida, Venezuela.
chamarra18@hotmail.com

Maria Dávila is a community leader in the páramos *of Mérida. She has been the driving force behind the creation of the Center for Participative Research at Gavidia and was the key local counterpart in facilitating the design of the action plan.*

FURTHER READING

Unidad Central de Coordinación, Proyecto Páramo Andino. 2005. *El proyecto Páramo Andino.* Website of the Andean *Páramo* Project (GEF–UNEP). http://www.condesan.org/ppa; accessed on 4 May 2005.

Monasterio M, Molinillo M. 2003. Venezuela. *In:* Hofstede R, Segarra P, Mena P, editors. *Los Páramos del Mundo. Proyecto Atlas Mundial de los Páramos.* Quito, Ecuador: Global Peatland Initiative, NC–UICN and Ecociencia, pp 205–237.

Downloaded From: https://complete.bioone.org/journals/Mountain-Research-and-Development on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use