

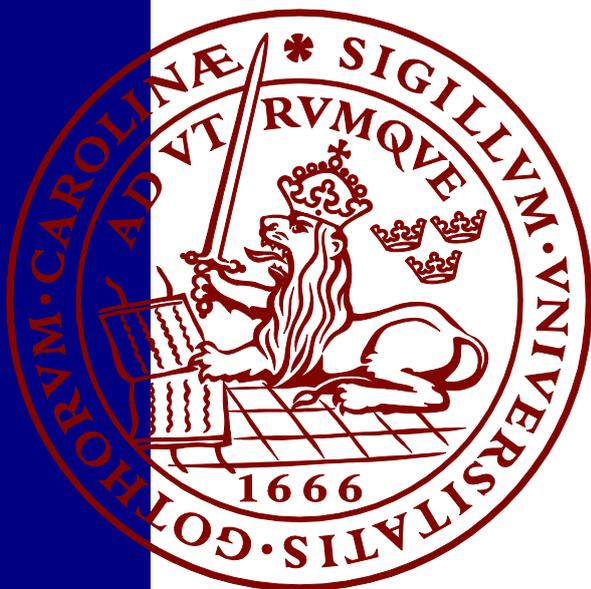
The Call of the Condor

Community-based initiatives as ecosystem conservation in
Colombia's páramos

María Daniela González

Master Thesis Series in Environmental Studies and Sustainability Science,
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A thesis submitted in partial fulfillment of the requirements of Lund University
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LUCSUS

Lund University Centre for
Sustainability Studies



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Abstract

The Colombian government aims to minimize the impacts of human activities in páramos. This requires finding balance between the conservation of the natural resources and maintaining the livelihoods of people living in these areas. Biodiversity loss in páramos compromises their ecological functionality and puts at risk the provisioning of drinking water to millions of Colombians. In this thesis I study a community-based conservation initiative in El Almorzadero páramo. I analyze and discuss the potential of this type of conservation scheme as an alternative to traditional protected area approaches. I use field observations and semi-structured interviews to collect data. I find that local context, institutional support, and changes in environmental perception are determining factors to sustainable resource management. Although there are several challenges such as opposition, absent governmental institutions, and a prohibitionist legal framework, the social benefits of this initiative are substantial, and they do not undermine its potential ecological benefits.

Keywords: Community-based conservation, sustainability, biodiversity, páramos, Colombia

Word count: 11.988

Resumen

El gobierno colombiano tiene como meta minimizar los impactos de las actividades humanas en los páramos. Esto requiere encontrar el balance entre la conservación de los recursos naturales y mantener los medios de vida de las personas que habitan estas áreas. La pérdida de biodiversidad en los páramos compromete su funcionalidad ecológica y pone en riesgo la provisión de agua de millones de colombianos. En esta tesis estudio una iniciativa comunitaria para la conservación en el páramo El Almorzadero. Analizo y discuto el potencial de este tipo de esquema de conservación como una alternativa a los esquemas de áreas protegidas más tradicionales. Uso observaciones de campo y entrevistas semiestructuradas como medios de recolección de datos. Encontré que el contexto local, el apoyo de instituciones, y cambios en la percepción ambiental son factores determinantes para el manejo sostenible de recursos naturales. Aunque existen varios desafíos como oposición, instituciones gubernamentales ausentes, y un marco legal prohibicionista, los beneficios sociales de esta alternativa son sustanciales y no comprometen los potenciales beneficios ecológicos.

Palabras clave: Conservación comunitaria, sostenibilidad, biodiversidad, páramos, Colombia

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List of Abbreviations

Acamco – Asociación Campesina Coexistiendo con el Cóndor

Am – Association member

CAS – Corporación Autónoma Regional de Santander

CBC – Community-based conservation

CBCI – Community-based conservation initiative

DNP – Departamento Nacional de Planeación

Ee – Environmental expert

la – Institutional actor

IAvH – Instituto de Investigación de Recursos Biológicos Alexander von Humboldt

MADS – Ministerio de Ambiente y Desarrollo Sostenible

Minciencias – Ministerio de Ciencia, Tecnología e Innovación

PJD – Parque Jaime Duque

SENA – Servicio Nacional de Aprendizaje

1. Introduction

1.1. Problem definition

Biodiversity plays both a vital role on the Earth system by maintaining ecosystems' resilience and variety (Rockström et al., 2009), and on human systems by supporting ecosystem services and human well-being (MADS, 2010). Biodiversity loss generates further environmental change (Rockström et al., 2009), and the number of species being threatened with extinction is already reaching a million and increasing (S. M. Díaz et al., 2019). The main drivers of biodiversity loss are human activities such as urbanization, pollution, overharvesting, and intensive agriculture (CBD, 2020), highlighting the indirect social, cultural, political, and economic drivers underlying this issue (Baldauf, 2020).

Colombia is no exception to this global trend of biodiversity loss and threatened species. Despite representing around 1% of the planet's terrestrial area, 10% of the global biodiversity is found in Colombia, making it one of the world's most megadiverse countries (USAID & PROCOLOMBIA, 2021). The population relies on services provided by nature such as food, raw materials, fertile soils, clean air, and drinking water (Sanchez, 2015). Furthermore, biodiversity is "a source of national pride with strong connections to Colombian history, culture, and artistic expressions" (Arbeláez-Cortés, 2013, p. 2876). The main drivers of biodiversity loss in the country are the expansion of agriculture and livestock, and the extraction of minerals, which has resulted in deforestation, habitat loss and fragmentation (Moreno & Andrade, 2020). The additional vulnerability to climate change further aggravates the potential extinction of 1.200 threatened species and the functionality of ecosystems (Moreno & Andrade, 2020).

In this thesis I inquire into and analyze the potential of community-based conservation initiatives (CBCIs) to fulfill Colombia's commitment of integrating conservation and local livelihoods (DNP, 2019) as a response to an increasing global concern to halt biodiversity loss. I use a case study of a particular CBCI in El Almorzadero páramo to identify the main shortcomings and opportunities of this conservation practice and place them in the broader field of conservation science. I collected data through semi-structured interviews and participant observation and analyzed them through the scope of sustainability transition theories. In the context of my thesis, biodiversity conservation is understood as the actions that local communities adopt to maintain their livelihoods that depend on natural resources (such as agriculture and livestock raising), whilst still protecting umbrella species in páramos.

1.2. Research questions

In this research I aim to understand the progress made by a community-based conservation in El Almorzadero páramo. In order to do so, I study the social dynamics, motivations, and changes in environmental perceptions that take place to determine the potential of this scheme in Colombia's páramo ecosystems. I also ascertain what the social and ecological outcomes of this CBCI have been thus far to determine whether or not it is an exemplary case of conservation. The following research questions guide my thesis:

Main RQ: To what extent can community-based conservation initiatives halt the ongoing loss of biodiversity in Colombia's páramo ecosystems?

Sub-RQ 1: What are the main enhancing and hindering factors in the El Almorzadero community-based conservation initiative?

Sub RQ2: How can the lessons from El Almorzadero's community-based initiative be used to enhance biodiversity conservation in other páramos in Colombia?

1.3. Contribution to sustainability

Colombia's government has set goals to increase conservation efforts, namely reducing environmental degradation, promoting circular economy, and supporting transitions to activities that enhance sustainability and mitigate climate change, all under the premise of "producing while conserving and conserving while producing" (DNP, 2019; MADS, 2010, 2019). 'Sustainability' is often mentioned in those goals, and research has been carried out identifying the importance of species, strategic ecosystems, and the services they provide, but their interaction with the social sphere is often overlooked, therefore not fully applying this concept (Sarmiento, Osejo, Ungar, & Zapata, 2017). Effective biodiversity conservation requires a paradigm change that includes humans as part of the ecosystem and encourages participatory approaches (Baldauf, 2020). Although this premise may seem obvious, the way in which conservation has been carried out in Colombia typically has lacked this understanding, and often favors protectionist approaches and research led by academia.

Sustainability science bridges society and nature and uses problem-solving and critical approaches to tackle complex challenges (Jerneck et al., 2011). Páramos are inhabited by people whose livelihoods depend on the use of land. The challenge lays in finding appropriate alternatives to the unsustainable livelihoods that are driving biodiversity loss—one that is yet to be resolved. Through my thesis I aim to contribute to sustainability by analyzing to what extent a community-based conservation initiative—a problem-solving approach—can offer a solution to this complex challenge.

2. Background

2.1. Community-based conservation

Approaches to biodiversity conservation have changed from a purely protectionist narrative to one that includes the “notion that conservation cannot and should not be pursued against the interests and wishes of local people” (Adams & Hulme, 2001, p. 193). The causes of this shift include the elevated costs and low economic return of protected areas compared to land uses compatible with human activities (Adams & Hulme, 2001), a growing agreement of participation as a core component of sustainability at a local level (Lovrić, 2019), and the understanding that zones outside of protected areas where communities manage resources are as important or even more important objects of conservation (Infield & Tolisano, 2019).

Community-based conservation (CBC) seeks to reverse top-down, center-driven conservation (Campbell & Vainio-Mattila, 2003) by finding common ground between biodiversity protection and local community livelihoods and benefits (Baldauf, 2020). CBC is used as an umbrella term that encompasses voluntary initiatives with the aim of linking conservation with development by positioning local communities as active stakeholders, main users and managers of natural resources (Brooks, Waylen, & Borgerhoff, 2013). There is a broad variety of ways in which these initiatives can take place, ranging from self-regulated to co-managed (Ruiz-Mallén & Corbera, 2013). In this thesis I will present *Acamco* (Farmer’s Association ‘Coexisting with the condor’) as an example of a co-managed community-based conservation initiative (CBCI), where NGOs are also active participants.

Despite their popularity, there is a debate around how effective CBC is in reducing biodiversity loss and achieving sustainability goals. Scholars and researchers highlight the role of dialogue and participation in the enhancement of environmental justice, legitimacy, and empowerment of conservation programs through CBCIs (Baldauf, 2020; Infield & Tolisano, 2019; Lovrić, 2019). CBCIs have been an important tool in areas of high biodiversity in Latin America, offering an alternative to colonial, state, and market-centered conservation schemes (Perasso, Christian, & Carvajal, 2019). Systematic reviews on CBC have determined that it is an effective conservation tool with the most influential factors for success being project design, capacity building, community characteristics (e.g. land tenure, cultural beliefs, leadership and institutions), participation, lower population size, and engagement with local cultural contexts (Brooks et al., 2013; Ruiz-Mallén & Corbera, 2013; Waylen, Fischer, McGowan, Thirgood, & Milner-Gulland, 2010).

The main critiques come from the premise of CBC as a ‘win-win’, but minimizing trade-offs between environmental, social and economic aspects is still a challenge (Hansen, Islar, & Krause, 2015). In some cases this conservation approach has given more importance to economic development, therefore undermining conservation efforts (Dressler, McDermont, & Schusser, 2015). Other scholars state that community initiatives often fail to consider the personal significance, and the cultural and spiritual values of the environment (Masterson, Spierenburg, & Tengö, 2019). Critics see CBC as weakened conservation that compromises ecosystem integrity and species preservation with its often-problematic implementation (Adams & Hulme, 2001).

2.2. Conservation in Colombia

The conservation discourse used by Colombia’s government and environmental authorities has shifted from the strict restriction of activities in strategic ecosystems and protected areas to the involvement civil society organizations, local communities, and environmental NGOs in decision-making processes regarding the use of natural resources and its protection (Ungar & Osejo Varona, 2016). However, there are limited instances in which this intention has in fact become a reality, in many cases it remains as a political and academic discourse (Ungar & Osejo Varona, 2016). Furthermore, the current development plan and legislation often mentions the importance of citizen participation, but it hardly defines how to guarantee it, resulting in environmental authorities and local governments informing communities but rarely using consultation or active involvement—a form of tokenism (Arnstein, 1969).

The protection of biodiversity in Colombia is challenging because of the scattered geographic distribution of strategic ecosystems and the heterogeneity among them, cultural diversity, social unbalance and political unrest—factors that require political will, social capital, and economic investments to tackle (Murcia, Kattan, & Andrade-Pérez, 2013). These factors challenge environmental governance in Colombia, resulting in weak protection of ecosystems and insufficient financial resources for local and regional environmental protection institutions.

2.3. Páramos and *El Almorzadero CBCI Acamco*

Páramos are high mountain ecosystems located between 3.400 and 5.000 meters above sea level. They are characterized by low temperatures and high velocity winds, and are considered one of the world’s biodiversity hotspots (Figure 1) (USAID & PROCOLOMBIA, 2021). Around 50% of the world’s páramos are located in Colombia, with their soils and vegetation absorbing and storing 80% of the country’s water and large amounts of carbon, giving them an important role in climate change mitigation and

adaptation (USAID & PROCOLOMBIA, 2021). Their vulnerability to environmental and climate disturbances, the conversion of native vegetation, and fragmentation and pollution from various activities—especially legal and illegal mining and the incorrect disposal of chemicals used in agriculture—are compromising their integrity and functionality (L. D. Llambí et al., 2005).



Figure 1. Páramo landscape characterized by high elevations, low temperatures and plants adapted to absorb water. Own photo taken in Cruz de Piedra sector, Almorzadero páramo in February 2021.

In Colombia, 45% of the 36 páramo ecosystems are currently under some category of protected designation and have been the subject of multiple legal protection instruments excluding them from mining activities (such as the recent *Páramo Law* 1930 from 2018) (Sarmiento et al., 2017). However, these laws are not effectively enforced (Murcia et al., 2013). The implementation of existing policies and the enforcement of environmental laws is especially challenging because of the complex social, economic, and political dynamics taking place in these ecosystems (L. Llambí & Cuesta, 2014). Some of the most relevant dynamics are the lack of recognition of local organizations, uncertainties concerning the legality of land tenure, the magnitude and impact of illegal activities, and financial and operational limitations of local institutions (Sarmiento et al., 2017).

Many people use and rely on the natural resources provided by páramos, with 17 million Colombians depending on the freshwater provided by these ecosystems, thus increasing the importance of their conservation (Galvis, 2021). The relationship between communities living in páramo areas and their local forms of governance and management are still not fully understood, which has encouraged the implementation of out-of-context management plans that often create greater problems (L. Llambí &

Cuesta, 2014). It is within this context that CBC has gained attention among researchers as an alternative to prohibitionist conservation schemes in páramos.

El Almorzadero páramo is located in the departments of Santander and Norte de Santander, Colombia. Its area of 125.120ha expands through 15 municipalities (Morales-Rivas et al., 2007), where around 8.272 people live and rely on the water and services provided by this ecosystem (Sarmiento et al., 2017). Common threats to its biodiversity include extensive agriculture and livestock raising resulting in changes in natural vegetation cover, and in lower proportion, retaliation against wildlife (mainly puma and condor) through hunting and poisoning.

The CBCI I studied in El Almorzadero páramo, *Acamco (Asociación campesina coexistiendo con el cóndor)*, started in 2017 with the objective of guaranteeing the conservation of the ecosystem and its biodiversity by protecting one of its emblematic species: the Andean Condor (*Vultur gryphus*), critically endangered in Colombia (Acevedo-Charry et al., 2019). This species inhabits and travels long distances along the Andes and is found in this páramo. The expansion of agriculture and livestock in the area has limited the availability of carrion by displacing and reducing the populations condor prey (e.g., deer and hare). Although mainly a scavenger, the Andean condor is capable of hunting lambs, calves, and other small mammals. Farmers recorded and reported these attacks on several occasions to environmental authorities, but obtained no response. Since livestock represents one of their main income sources, some farmers responded by hunting and poisoning condors, which has reduced the population of the Andean condor.

Initially, ten families who have experienced a conflict with the condor and who depend on livestock as their main source of income joined the CBCI by balancing conservation and production under an agreement with an NGO (*Fundación Neotropical*) and the National Learning Service (*SENA*). During the following years, more families joined the initiative and two additional NGOs (*Parque Jaime Duque* and *Fundación Bioandina*) provided economic resources and guidance. Some of the achievements thus far include the construction of pens for sheep to reduce the pressure of livestock on soil and vegetation and to shelter them from condors, construction of feeding and monitoring spaces for condors, technical assistance to apply sustainable agricultural production practices, and creation of greenhouses to grow native plants useful for reforestation. Currently, *Acamco* is made up of 19 families from the municipalities of Cerrito and San Andrés who seek the establishment of natural reserves in their farms. *Acamco* applies a local governance model by having regular meetings to monitor their projects and making decisions. They also have an elected leader who seeks partnerships with other institutions and voices community's concerns to governmental institutions.

The protection of El Almorzadero páramo is especially important because of its location in Colombia's páramo systems, where it connects to other páramos and completes a corridor for wildlife to move along the Andes (Figure 2, a.). Despite its ecological importance, this páramo is not part of the National Natural Parks System (Figure 2, b.). For this research, I selected *Acamco* as an exemplary case to analyze because the responsibility of conservation has shifted from the supporting NGOs to the community, therefore placing decision-making and governance in the hands of local farmers.

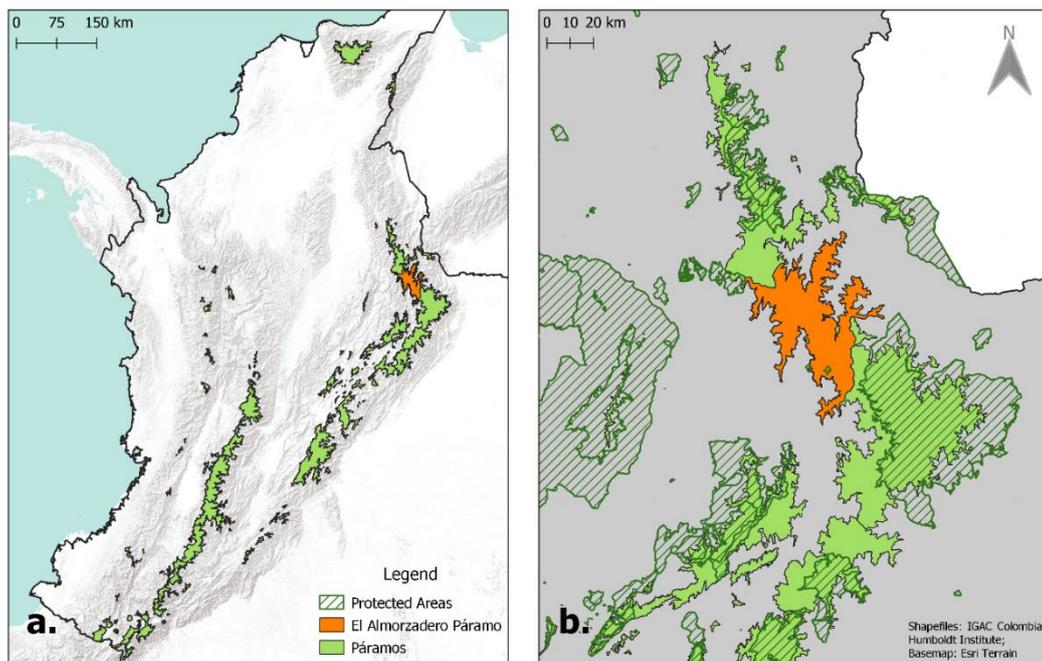


Figure 2. a. Location of El Almorzadero páramo among Colombia's páramo system. **b.** Location of protected areas near the study area. Own creation with data from Agustín Codazzi Geographical Institute and Humboldt Institute.

Furthermore, new members keep joining the initiative, providing a diverse array of motivations and perceptions of biodiversity conservation in the region. Through this case study, I analyze the role of CBC in strategic ecosystems in Colombia through a study of community dynamics, the initial and current role of institutions, and the change in environmental perceptions of the participants. I hereby contribute by giving a voice to this community that could potentially become an example of conservation in other páramos, while still acknowledging the trade-offs and shortcomings present in their processes.

3. Theoretical framework

3.1. Sustainability transitions

Sustainability transitions refers to the large-scale societal changes needed to address the complex challenges arising from society's interaction with its natural surroundings (Loorbach, Frantzeskaki, &

Avelino, 2017), mainly “changes in technology, user practices, business models, policies and governance approaches, and cultural meanings” (Schlaile & Urmetzer, 2019, p. 1). The goal of sustainability transitions is to find a pathway towards sustainability by intervening in current human practices. Research on transitions has been mainly focused on local human-nature interactions, seeking the sustainable management of natural resources and ecosystems by changing behaviors and values (European Environment Agency, 2018). The literature suggests that transitions depend on business, communities, and civil society, with local actors being essential for bottom-up approaches but usually having weaker agency (Fischer & Newig, 2016). Some conclude that the effectiveness of sustainability transitions depends on national actors, since tensions among local authorities are common and can hinder their objectives (Fischer & Newig, 2016).

CBC is a scheme that facilitates the transition from a state of unsustainable practices to one that balances livelihoods and the protection of ecosystems. This is accomplished by intervening in current practices and potentially changing the trajectory of outcomes. In the case of El Almorzadero, there was previously a state characterized by detachment from the ecosystem, with inhabitants mainly viewing the area as a space to farm. Through the creation of *Acamco*, those original views have transitioned towards more sustainable ones, and now conservation is a bottom-up endeavor. In this thesis I borrow insights from two of the approaches towards sustainability transitions: socio-ecological systems, and action-oriented perspectives. These provide an appropriate theoretical background to discuss CBC.

3.2. Socio-ecological transitions approach

This approach derives from the premise that there shouldn't be a distinction between social and ecological systems since there are strong interconnections, interdependencies, and feedback effects between them (Schlaile & Urmetzer, 2019). This is the case for El Almorzadero, where the use of natural resources is deeply intertwined with the people who inhabit the area. The approach states that achieving sustainability goals and increasing the resilience of the environment is to be accomplished through the adaptive and transformative capacity of society (Loorbach et al., 2017; Schlaile & Urmetzer, 2019). Transitions in social contexts are based on learning, experimentation, and iteration that lead to gradual changes in behavior and attitudes towards the environment (Smith & Stirling, 2008). Although research in this field emphasizes the potential of grassroots movements and local innovation, it also highlights that they could be limited in achieving systematic change due to lock-ins and trade-offs (European Environment Agency, 2018). In the field of biodiversity, socio-ecological transitions seek the holistic management of territories by halting the profound changes society has caused on the environment and working on initiatives that prevent further biodiversity loss (Andrade-Pérez et al., 2019).

In Colombia, socio-ecological transitions towards sustainability have been adopted as an approach that recognizes the diversity of actors relying on biodiversity and the urgent need to properly manage those relationships, especially in páramos, which are recognized as socio-ecological systems (J. L. Díaz, Varela, Ordóñez, Solanilla, & Bahamón, 2020). The Alexander von Humboldt research institute (IAvH) supports that socio-ecological transitions are the pathway towards conservation in the country (Andrade-Pérez et al., 2019), but their action to facilitate these processes is unclear. Within this context, I will use arguments from the debate around the effectiveness of this approach to discuss how *Acamco* is an example of a process that has contributed to the transition towards a more sustainable management of natural resources and land in El Almorzadero.

3.3. Action-oriented perspectives on transitions and system innovation approach

Action-oriented perspectives adapt social practice theory and rely on community-based NGOs, city-level authorities, and trade unions to achieve social change through visioning, experimenting, networking, and navigating (European Environment Agency, 2018). The focus of this approach is on action and actors (groups rather than individuals) and on guiding the direction of change towards sustainable pathways (Steward, 2018).

Research on this domain questions “the capacity for local initiatives to achieve systematic change at the scale needed to address global sustainability challenges” (European Environment Agency, 2018, p. 13). Experiments designed by communities under this approach are effective in voicing their priorities, incorporating both practice-based and academic knowledge, working towards new modes of participative governance, and ultimately, demonstrating that there are alternative pathways to sustainability (Steward, 2018). The focus on group agency and experiments at a community level make this a suitable approach to discuss how decisions and actions made by *Acamco* members have changed their relationship with the ecosystem.

4. Methodology

I adopted a qualitative research approach using a case study. The purpose of selecting a single case study was to inquire and understand the dynamics in this local context and then place them in the broader field of CBC as a socio-ecological and action-based transition towards sustainability in strategic ecosystems. This is a representative case on the challenges of civil society and local communities seeking to balance local livelihoods with the protection of biodiversity in páramos in Colombia.

4.1. Data collection

I collected data through semi-structured interviews with relevant actors of El Almorzadero CBCI, including community members, officials from local environmental authorities, NGO workers, and an

expert in the topic. I prepared an interview guide based on the template designed for research in high mountain ecosystems (Palacio, 2015). The result of the modification of this original template were three interview guides designed depending on the interviewee (member of the association, private or public institution actor, and environmental expert) (**Appendix 1.**) I opted for this methodology because interviews provide a firsthand insight into actors' participation and thoughts on this initiative, which in turn provides appropriate data to answer the research questions. Furthermore, this is a flexible method where both the researcher and the interviewee can guide the conversation and provide thoughtful contributions. I carried out my interviews during February and March of 2021, both in the field, and through phone and video calls. I carried out my field work in the municipalities of Cerrito and San Andrés, where the farms of the 19 families of *Acamco* are located (Figure 3).

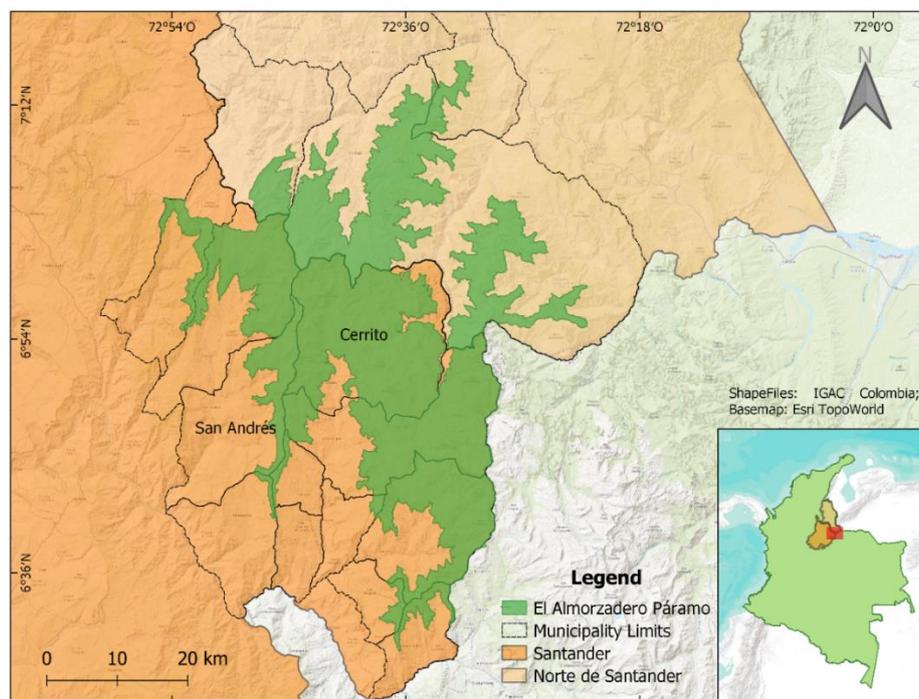


Figure 3. Location of Cerrito and San Andrés municipalities where fieldwork was carried out. Own creation with data from Agustín Codazzi Geographical Institute.

Some of the interviewees were selected beforehand due to their relevance and importance in *Acamco*, such as the community leader and NGO representatives. The process was complemented through snowball sampling (Bryman, 2012). Representativeness was increased by including members of the community that live in different villages and sectors, belong to different age groups, and joined the process during different stages. Interviews lasted up to 60 minutes and were carried out at participant's houses and farms (Figure 4, a.). They were recorded after interviewees gave their consent and were informed about the objectives of my research. This data was complemented with in-field observations I gathered from daily routines (Figure 4, b.), farming activities, family interactions, and

assistance in meetings between association members and institutional actors. I kept a journal in which I recorded the main discussion points of each interview as well as relevant observations and interactions outside of these spaces.



Figure 4. Photos from data collection phase. **a.** Semi-structured interview carried out at a participant's house; **b.** conversations and observations collected while accompanying interviewees in their daily routines, in this case fishing. Photos taken by a companion in February 2021.

4.2. Data analysis

I conducted a total of 25 interviews. Details of the anonymized profiles of interviewees are presented in **Appendix 2**. Of these interviewees, 18 have been members of *Acamco* for one and four years, their ages range between 25 and 69, and they own properties in El Almorzadero páramo. I was also able to interview the children of some of these participants with their parent's consent. They contributed with additional insights. Participants in this category will be coded as **Am** (association members) 1 through 18.

Additionally, I interviewed six institutional actors to understand the role of each institution in the area. Their insights will be coded as **Ia** (Institutional actors) 1 through 6. They belong to the mayoral office of Cerrito municipality, to the local environmental authority CAS (Corporación Autónoma de Santander), to the NGO PJD, and to Minciencias (Ministry of Science, Technology, and Innovation). The last person I interviewed is an environmental expert who has done research on páramos and is familiar with the evolution of conservation in these ecosystems. Insights from this participant will be coded as **Ee** (environmental expert) 1.

After I transcribed all the interviews, I processed them using a thematic analysis (Bryman, 2012). Quotes and information were extracted from each interview and from field observations to provide answers to the research questions. Since interviews were conducted in Spanish, all quotes used in this

thesis are translations. The themes selected were the most recurrent throughout conversations and they are outlined in Figure 5.

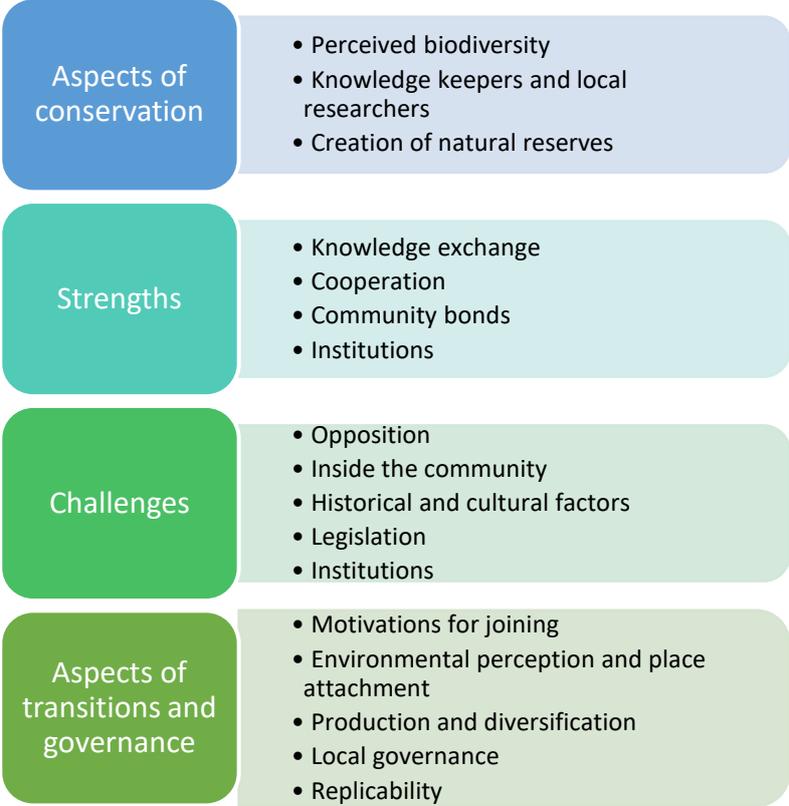


Figure 5. Themes and subthemes selected for the thematic analysis of interviews and observations.

I discussed the findings of my research through the scope of sustainability transition theories, mainly through the socio-ecological transitions approach (Andrade-Pérez et al., 2019; Laurent & Pochet, 2015; Loorbach et al., 2017; Schlaile & Urmetzer, 2019) and the action-oriented perspectives and system innovation approach (European Environment Agency, 2018; Steward, 2018). I also drew comparisons to other community initiatives in the region and elsewhere to find common aspects of either hinderance or enhancement, and to contrast their progress with that of *Acamco*.

4.3. Limitations

What I present in this thesis is the result of the analysis of a particular CBCI. Using a case study as a unit of analysis has several limitations, mostly in the reliability, replicability, and validity of the results (Bryman, 2012). Focusing on a spatially defined system could also limit the scope of the particular sustainability issue by ignoring other relevant actors that are not directly inside of said area (European Environment Agency, 2018). Therefore, the conclusions of my thesis are attached to the context of El Almorzadero páramo, which has a set of socioenvironmental conditions that might differ with those in

páramos in other areas of the country. I will make generalized conclusions for aspects that are common among páramo ecosystems.

While writing this thesis, I also considered that interviewing members of the association and institutions that work for sustainability can lead to certain biases, namely offering a positive and affirmative view on processes with the aim of biodiversity conservation. When possible, I validated their statements with field observations or conversations with outsiders to the process. In this thesis I discuss the socio-ecological outcomes of this initiative. As baseline information for both is limited, interviewee's recalling and observations were used as a main data source. Due to the nature of the methodology I used in my research, I was involved on a personal basis with its participants. I was also familiar with the region and the conservation initiatives in the area beforehand. I strived to be objective by only incorporating the data I collected for the purpose of this thesis.

5. Findings

The questions about associativity and participation prompted interviewees to retell their experiences of working in the community and to highlight the different aspects of this type of organization. Outsider perspective was very valuable to add further evidence of the factors that have enhanced and limited *Acamco's* CBCI, and the socio-ecological outcomes of this association. It also provided insights into the role of their own institutions and their participation in the process. In this section I summarize the recurrent themes that emerged throughout conversations and observations.

5.1. Aspects of biodiversity conservation

5.1.1. Perceived biodiversity

When I asked interviewees and local community members about the biodiversity of El Almorzadero, respondents **Am2**, **Am11**, **Am12**, **la1** and **la2** emphasized the variety of animal and plant species found in their farms, with **la1** mentioning that the condor and other species are “the pride of the municipality”. **la2** from local environmental authority (CAS) thinks that “it is a very biodiverse space, but we don't take advantage of it, we don't value its importance or its fragility”. This opinion contrasts with that of the wider community. **Am11** acknowledged that in the past they would take biodiversity for granted, but they are more likely to appreciate what they have now. Furthermore, **Am9**, **Am12**, and **Am17** understand their roles in preserving biodiversity by “creating reserves, isolating areas inside farms, protecting water sources and reforestation”—actions that **Am9** has integrated in their household.

Water seems to be the most appreciated aspect of the ecosystem, a perspective highlighted not only by association members but also by institutional actors. **la6** concluded, “What is more strategic than a páramo where the water that so many people benefit from is produced?”.

5.1.2. Members as knowledge keepers and local researchers

All the association members that participated in this study have lived and worked in the páramo their whole lives, which has given them a deep understanding of their surroundings and great knowledge about biodiversity and its uses. During conversations and field observations, I saw that even the youngest members of the community can distinguish species and discuss the importance of their protection. **la5** and **la6** mentioned how crucial this knowledge is, with the latter saying that “they are the ones who know their territories. So anything that we say from the city is an approximation, but the ones who know the reality is them (...) They are the main allies because they care about protecting the place they love, where they work, where they have their families and culture”. Local knowledge and individual perceptions are critical for designing context appropriate conservation projects and to monitor ecological changes in areas with absent ecological baselines, much like this case (Fernández-Llamazares et al., 2016).

Although much of this knowledge has been transmitted over generations, local inhabitants have also become active researchers in the region. An example of this is the First National Census of the Andean condor, organized nationally with support of NGOs and governmental institutions in February 2021. In El Almorzadero, several members of *Acamco* and farmers from the municipality joined teams in their search of the species. Data from this activity will be the main input for an update of the national conservation plan for the species. The combination of practice based and academic knowledge is one of the main characteristics of action-based transitions (Steward, 2018), and this sort of activity with other stakeholders shows that *Acamco* is incorporating both sources of knowledge into their process.

5.1.3. Creation of natural reserves

When a family joins *Acamco*, they start a process towards transforming their farms into a natural reserve where they produce using more sustainable practices. The family works together with PJD employees, SENA, and university students and interns to create the environmental management plan for their farms. This document outlines the vision for the reserve, which encourages production through sustainable practices and areas destined for conservation. The creation of this plan has already started in more than 10 farms, covering a páramo area of approximately 1.300ha, which could potentially lessen the threats that intensive agriculture and livestock represent. The declaration of the reserve is a voluntary process and is considered an accomplishment inside the community. **Am11** mentioned that turning their farm into a reserve (Figure 6) required not only a lot of work, but also a change of mindset, but it was ultimately “one of our main tasks, to take care of the páramo and for the future of our children”.



Figure 6. Sign indicating that this farm has been voluntarily declared as a natural reserve by its owners. Own photo taken in Cruz de Piedra sector, Almorzadero páramo in February 2021.

5.2. Strengths and opportunities

5.2.1. Space for knowledge exchange

When I asked about the strengths of working in a community, most participant’s initial answer was to highlight the exchange of ideas and knowledge that occurs within the group. **Am11** mentioned that this was not common in the area, where farmers are likely to work individually. But, they elaborated, the association gave them the chance to “share many new things with people from other villages and learn new things from them as they did from us”. **Am15** expressed that the main goal of sharing their ideas is to “learn how to look after and protect the species that are here in the páramo, in our farms”.

The association has facilitated this exchange in their monthly meetings that take place in a different household each time, where members have the space to share new ideas or experiences encountered in their own farms. **Am5** concluded that new suggestions arise from the ideas other members share and that “in the end, the one that best suits all of us is taken, the one that is convenient for the community, because one has to work in community and not only for the welfare of one alone”. This joint decision-making has been known to foster self-governance (Andersson, Chang, & Molina-Garzón, 2020), and in the case of *Acamco*, has facilitated the creation of collaborative projects that all members benefit from.

5.2.2. Cooperation between members

The accomplishments of the association are the result of teamwork, as **Am2** stated. The interviewee mentioned that cooperation has not only reduced costs, but has also improved and increased the

sustainability of production practices in farms. **Am16** recalled that activities carried out together include planting trees; installing fences around rivers, lagoons, and vegetated areas to prevent domestic animals from causing damage to the ecosystem; and building facilities to hold sheep and reduce extensive cattle grazing. **Am5** mentioned that when the association sets a day to work, everyone contributes and dedicates their day for this purpose.

Ia3 from PJD has joined and participated in these workdays and finds that cooperation is one of the most beautiful aspects of the association, especially since working together has become some sort of need: “the need to be in a group, to meet every month, to make lunch together and to work for the sake of supporting each other”. This model of community work is inspired by *mingas*—an Andean ancestral practice in which all members do agricultural work collectively under the principles of reciprocity, participation, and solidarity (Obando, 2015). *Mingas* are important elements in action-based transitions since they potentialize collective action and enhance social cohesion, equity, leadership, and sense of local belonging (Obando, 2015).

5.2.3. Stronger community bonds

Cooperation has tightened community bonds and created a new dynamic among members. **Am2**, **Am8** and **Am11** mentioned that their trust has increased and that before they considered each other neighbors or co-members of the association, but now they are friends. Both my field observations and declarations from the two PJD workers in the area confirm this bond. **Ia4** mentioned that institutional actors have also been welcomed into the community: “we try not to meet exclusively to work or to talk about the process, but sometimes we visit them just to share, to get closer to them”. Although I carried out my study during the COVID-19 pandemic, this particular context highlights the importance of community bonds. During casual conversations members often mentioned how much they miss meeting up for sharing a meal or just hanging out in the town’s square.

5.2.4. Guiding and supporting institutions

All participants gave credit to external institutions for starting the process towards conversion of their production activities and conservation of the ecosystem, which ultimately led to the creation of *Acamco* as an association led by the community. The first two NGOs, Fundación Neotropical and PJD, originally arrived at the region looking for an area where condors could be reintroduced to the wild safely. PJD has continuously supported the process by providing professionals and economic resources. **Ia4** expressed that the original motivation has changed: “It is clear that more than releasing an animal, it is guiding a community that understands the importance of conservation”. The growing list of allies now includes SENA, Minciencias, and local universities, to which *Acamco* has given students and interns the opportunity to work with them and generate knowledge with local talent.

Am2 thinks that “institutional support is fundamental because farmer communities don’t have the resources or the knowledge to really generate a discussion and participate in territorial planning”. This position is supported by all institutional actors as well as the environmental expert I consulted.

5.3. Challenges and threats

5.3.1. Opposition from outsiders

Several respondents list opposition from outsiders as one of the project’s main hindering factors. This opposition is mainly the product of envy and disinformation. According to **Am11**, it is common to hear comments around town such as “Why them and not me? Why is it in that village? Why is it with that group?”. This kind of negativity has affected the motivation of the association and generated mistrust in town. **Am16** believes that the best way to reduce those tensions is by becoming an example and showing concrete results to other people.

Disinformation is the result of gossip and misunderstanding of the process and legislation. **Am2**, **Am8** and **Am15** recounted experiences in which they have been accused of “giving the páramo to the government”, “selling land in exchange of benefits”, and “allowing exploitation and mining”. **Ee1** explained that this is a common trend among all páramos that has resulted from recent legislation (see section 5.3.4) which is not appropriately socialized, resulting in fake information being spread through WhatsApp chains. **Ee1** concludes that it is hard to clear up misunderstandings because sometimes “certain local organizations want to keep people worried, because people who are worried are people who vote”.

5.3.2. Limitations within the association

Am2 mentioned that some members lack interest or sense of belonging to the process, therefore not taking responsibilities seriously or being only partially involved in the project. **Am5** thinks that leadership is missing, which has hindered bonds with other associations and affected the agency of the community.

However, the most recurrent aspect is that “some members are just there to sign their name in the attendance record, but they are not really committed” —acting as free riders—as **Am11** mentioned. **Am3** and **Am6** agreed, saying that some association members are very active when it is time to receive benefits such as materials for infrastructure improvement or for agriculture, but stop participating once it is time to work, show results, accomplish goals, or fulfill the requirements to remain as members. Although this is the case for only a few members, the free riding problem is common among community initiatives and can be addressed through social sanctioning (norms of fairness or costly punishments), social intermediation, institution building, or in some cases, top-down interventions from outsiders (Breier & Visser, 2006; Steward, 2018).

5.3.3. Cultural and historical factors

Challenges in this category are mainly recognized by institutional actors. **Ia3** and **Ia4** believe that there is a lot of resistance to changes when traditions are so strong within the community. Farms have been owned by families for generations and work has been done in the same way, so changing those customs that have become part of the local culture is very difficult.

Ia2 mentioned that one of the reasons community initiatives fail is because there is resistance towards institutions and the state, which are the result of individualistic and distrustful behaviors of the inhabitants of the region. The interviewee mentioned that “the last 500 years of Santander’s history have marked us. Those conflicts and wars that we had in the area contributed to that (...) What we lived here was very hard, and it was even harder for people in the mountains”. This is a reference to the ongoing armed conflict between the state and the revolutionary group ELN, which has deeply affected el Almorzadero, a strategic transit area for the military and rebel groups. **Am1** and **Am2** further mentioned this conflict as a hindering factor, stating that they have reduced their project participation since social and environmental leaders are subject to threats and murders. **Am2** expressed that concerns for safety have increased after the murders of a social leader, and a national park ranger in the close area of El Cocuy in 2020, and the assassination of Gonzalo Cardona Molina—an environmental defender, farmer, and leader of conservation initiatives of the endangered yellow-eared parrot in January 2021 (Indepaz, 2021; Puentes, 2021).

5.3.4. Prohibitionist legislation

Law 1930, known as *the páramo law* (Congress of Colombia, 2018), has the objective of managing these ecosystems by first defining all páramos in Colombia through the creation of maps—tasked to the IAvH—and then regulating anthropogenic activities carried out in them—a job assigned to regional environmental corporations (in this case, CAS). **Ee1** highlighted how successful the law was in prohibiting mining in páramos—or at least, legal mining. But other than this success, the law has generated several conflicts in the area.

Ee1 reflects that the scenario before the law was already very prohibitionist. Then the law further forbade certain farming activities, allowing only “low impact agriculture”, a term that has been “entangled in a whirlpool of technicalities, where no one knows what low impacts means”. This, combined with very poor socialization of the law to local communities and their absence during its creation, generated many misconceptions and disinformation. Farmers I spoke with expressed their fear of being displaced, a fear that **Ee1** finds understandable but unreasonable. **Ia2** assured that the purpose of the law is not to appropriate lands, but to maintain livelihoods under certain sustainability principles, yet also agreeing that “as with many other decisions, they are taken from the big cities”. In

the case of El Almorzadero, **Ee1** mentioned that there are groups with the clear intention of sharing false information and that “local organizations lack the agency that regional corporations have”. All concerns are aggravated by the status of land tenure in the area, with many farmers having outdated and invalid land titles, which they believe will compromise their ownership once the law is fully adopted. Many communities around the country have filed lawsuits to modify the terms of this legislation, but as of now the situation remains the same, with the COVID-19 pandemic offering additional excuses to delay any progress.

5.3.5. Lack of support from governmental institutions

The absence of the state is a challenge shared by several participants. **Am1** thinks that the government encourages the creation of associations, but once the association is formed, the government is absent. **Am11** shared this opinion and states that credibility is lost because many institutions “want to take advantage of our knowledge and our results when they are not even part of the association.” I heard many stories about functionaries from the mayor’s office, the governorate, or local environmental authority (CAS) who show up in the area when there is news coverage, but then they are not seen again. **Ia4** and **Ia5** also point out the gap between decision-making in institutions and the reality of páramos, stating that they disregard local contexts, particularly when skipping the consultation stage during the creation of laws and in the application of projects that are part of the national development plan.

5.4. Aspects of transitions and governance

5.4.1. Motivations for joining

Interviewees mentioned two main reasons for joining the CBCI: 1) as a solution to their conflict with the condor, and 2) to obtain materials and economic benefits. **Am13** found out about the project through other members and thought “it would be easy to join and get some wood and fence to improve the farm”. **Am18** who heard about the initiative from an institutional actor joined because they “always wanted to have a productive farm that still preserved natural resources”.

Time since joining is a determining factor in how motivations of the participants have changed or not, as evidenced by interviews with members who have been members for longer time: **Am13** stated that their motivations for staying have not changed much throughout the last year. By contrast, **Am2**, **Am9**, **Am15** and **Am16** explained how much their purpose has changed in 4 years as they now value their permanence in the territory and sustainable production in their farms as a main goal. They also mentioned the non-monetary value of nature as a reason for participating, which has been listed as one of the factors for effective CBC (Adams & Hulme, 2001). Meanings and motivations change over

time, and considering those changes as well as their diversity within the community is critical in designing projects for the sustainable management of resources (Fernández-Llamazares et al., 2016).

5.4.2. Environmental perception and place attachment

Perhaps one of the aspects that has changed the most in the community is their environmental perception and place attachment. What before was considered a land to produce is now regarded as a territory to be proud of, or as **Am11** mentioned, “we now feel that the páramo is truly ours and that therefore we must take care of it, because we used to listen, but we did not really believe it”. Outsiders of the process highlight the enthusiasm and motivation that has been generated inside the association as well as a sense of responsibility towards the ecosystem. These feelings have been highlighted by the COVID-19 pandemic. **Am5**, **Am13** and **Ia4** mentioned that lockdown made them realize how privileged they are to live in a space where they could take care of their physical and mental health, which has contributed to their attachment. **Ia3** and **Ia4**, who have witnessed the process since the start, accept that the hardest challenge was to change mindsets and shift environmental perceptions, but they are sure that the objective has been fulfilled. **Ia4** is surprised to see that “they are the ones who took the initiative to change their farms and improve things”.

After clearing up misconceptions and through the joint work of institutions and community, the image of the condor, which was discouraging a healthy relationship with the ecosystem, has shifted. An expression I heard a lot during conversations was “from our enemy to our ally”, which was ultimately the main objective of the CBCI (Figure 7).

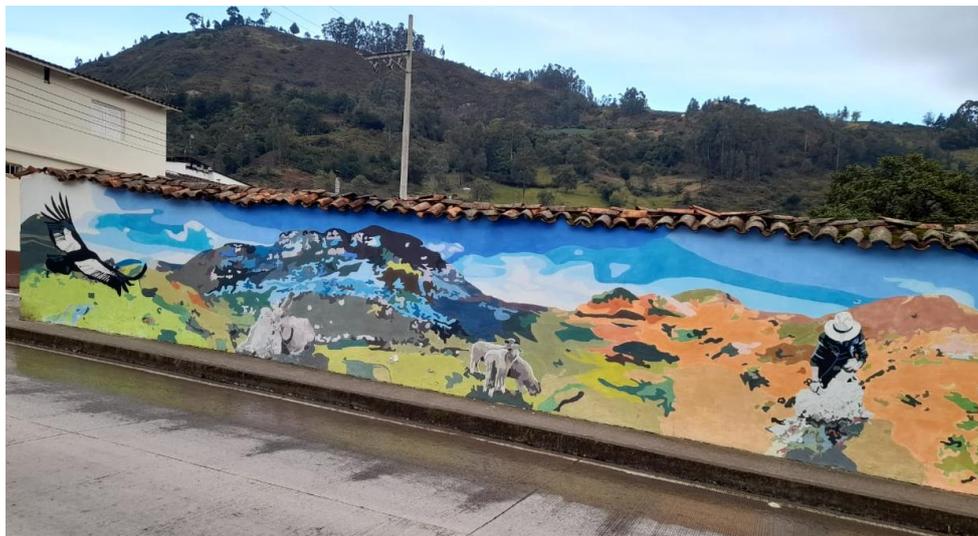


Figure 7. Mural painted at a CBCI member’s house showing coexistence between the ecosystem and farmers. Photo taken by Am2 in Cerrito, Santander in March 2021.

5.4.3. Production and diversification

All participants of this study, regardless of their relationship with the CBCI, agreed that the goal of the association is for communities to maintain their livelihoods and permanence in the territory whilst preserving the ecosystem. Finding the balance between production and conservation requires changes to production practices and a diversification of activities. When I asked about how production and household practices have changed since joining the association, there were five major actions: improvement of houses (better waste disposal, water saving, and infrastructure), diversification of agricultural products, construction of shelter for livestock (Figure 8, a.), creation of greenhouses (Figure 8, b.), and implementation of silvopastoral systems. Although not all farms I visited have applied all these strategies, they all show progress and interest towards that goal, showcasing an adaptative and transformative capacity necessary for transition towards sustainability (Loorbach et al., 2017; Schlaile & Urmetzer, 2019). **Am16** and other members mentioned that diversification gave them resilience during the COVID-19 pandemic, since “we have products for our own consumption, and we don’t have to go to town to buy them”.



Figure 8. Alterations and additions done in farms. **a.** Construction for sheltering sheep and avoid intensive grazing and condor attacks. **b.** Greenhouse for the propagation of native species for reforestation. Own photos taken in Cruz de Piedra sector, Almorzadero páramo in February 2021.

Tourism has also gained importance as an alternative activity to support livelihoods in El Almorzadero. **Ia1** mentioned that recently people have visited Cerrito for the purpose of condor sightings and the tourism office is working to “consolidate and organize the activity”. 2019 saw the celebration of the Second Andean condor festival in the municipality, which has since then incorporated the bird as one of its symbols (Figure 9). Community members showed different opinions about this tourism. **Am11** thinks that if not for the pandemic, the association would be trying to attract more visitors. **Am1** and **Am5** showed no opposition but are worried that “reckless visitors” might cause damage to the ecosystem or violate private property rights. **Ee1** believes that tourism can be an appropriate addition in sustainable transitions if it is organized and responds to the community’s concerns.



Figure 9. a. Main square of Cerrito adorned with a condor mosaic. b. Restaurant in Cerrito using the condor as image. Own photos taken in Cerrito, Santander in February 2021.

5.4.4. Local governance

Ee1 emphasized the determining role that civil society organizations have in local governance, which they themselves can exercise. They state that “what we have seen in these diverse territories is that a good part of the conservation initiatives came from civil society”. **Ia3** mentioned that the formation of *Acamco* was a response to the lack of solutions offered by the local government and environmental authorities: “nobody would give them an answer”. *Acamco* has reached several milestones since its formation by actively engaging in discussions with the mayor’s office and seeking partnerships with governmental institutions. Although the association has a voted leader, every member is consulted and considered for decision making, which I was a witness of during meetings I attended.

5.4.5. Replicability of the process

Replicability of this process is one of the factors that could help CBCIs achieve systematic change. **Ia4** stated that the replicability in other territories has always been a topic of interest in the community. “We have always said that this process can be replicated in areas with similar socio-environmental conditions. So any community that wants to learn something from us, we are very open to teaching and also learning from them”. On the other hand, **Ia3** considers that the process cannot be replicated, although it can be adapted. They ultimately concluded that other than socioecological similarities, adaptability also requires “that many variables are in favor, such as institutions, the appropriation by the people, the communities and the resources”.

6. Discussion

6.1. Balancing social and ecological outcomes

Communities are using the natural resources available in páramos. They are part of these ecosystems because their families have traditionally owned land in them or because they were forced to move to the area due to forced displacement during Colombia's armed conflict, or rising costs of living in nearby towns. Attempts to ignore their presence in policies, the design of conservation projects, and research are not only unjust, but also an omission of local realities and dynamics that take place. Achieving a transition towards a more sustainable land use requires to responsibly manage natural resources and guarantee biodiversity conservation by including these people, and to craft strategies that reduce the inevitable impacts of their activity in these strategic ecosystems.

Acamco has responded to this challenge by taking a risk that encompasses experimenting and acting in community to change the current trajectory towards biodiversity loss and resource exhaustion in El Almorzadero. During my field work I realized that their CBCI has been very successful in social terms by empowering a community that has been ignored by the state, tightening community bonds, and creating new opportunities through diversification and alternative incomes. However, to determine to what extent this sort of initiative can halt biodiversity loss, the ecological outcomes need to be weighed as well.

One of the main findings of my research is that there has been a profound change in how the ecosystem is perceived by the members of the community. Most of them defined their relationship with the páramo as one of respect, which was evidenced by how they have modified their production activities using more sustainable farming methods, even if this represents having smaller areas for farming. Changes in farmer's motivations for staying in the process were also significant. Although initially driven by economic benefits, there was a consensus among all members that have been in *Acamco* for longer than 2 years that their reason for staying is conservation. The problem of free-riders, especially those who recently joined, is particularly challenging to tackle, but the contrasting priorities people have for joining indicate that time is a determining variable in people's environmental engagement and that there is strong potential for the future of the association, with old and new members working towards common goals. These are valuable outcomes of the process, since personal and community values built around conservation and the non-monetary value of nature are aspects that not only enhance the results of CBC (Baldauf, 2020; Lovrić, 2019), but also facilitate effective transitions in socio-ecological systems (Smith & Stirling, 2008).

Another noteworthy finding is the rate at which research is being produced in El Almorzadero as result of this initiative. While doing the literature review for this thesis, I found a limited number of technical studies carried out in this páramo, with the most detailed one being the environmental management plan for the ecosystem carried out by the environmental authority (CAS) in 2009. Other studies by regional universities and CAS are either social or ecological, but not holistic. The most recent attempt at an integrated study was an updated management plan to be carried out by CAS as one of their responsibilities stipulated in the 2018 páramo law. I was told by certain community members that they were informed of this management plan and their farms were visited by CAS functionaries. The results of this study are yet to be made public. The creation of natural reserves in *Acamco* requires an updated environmental management plan made through inter-institutional collaboration and with the input of farm owners. The elaboration of these plans has required the installation of camera traps and continuous observations by biologists and ecologists. Recent thesis projects by local university students have measured variables such as water and soil quality, and adaptability of vegetation in the ecosystem. All in all, these projects have contributed to an updated library of ecological research unprecedented in the area, which is a very valuable information resource combining practice based and academic knowledge. However, with an outdated and limited baseline, it has been especially challenging to compare data and make conclusions regarding the ecological impacts that the association has.

One of the most significant results of this CBCI is that the area in which domestic animals graze in farms has been reduced. I was able to confirm this reduction through guided walks and visits to the farms, by talking to their owners, and by comparing photos and drone images taken by PJD years ago with their current state. Further research is necessary to understand the effects of this reduction on soil quality and native vegetation cover. Some families have also reduced the size of their crops by using crop rotation and diversification. None of the interviewees reported a loss in yield, mentioning that they have enough to feed the family as well as surplus for selling. This reduction of agricultural intensity is an indicator of future positive environmental impact in the area.

When asked about environmental and biodiversity perception, several members pointed out that they have seen an increase in species abundance in the páramo. Interviewees **Am6** and **Am8** mentioned common sightings of deer and birds. Although it will take time to verify their claims, “regardless of whether local perceptions are accurate or not from an ecological standpoint, they are crucial in informing sustainable management of dwindling natural resources” (Fernández-Llamazares et al., 2016, p. 15). The partial results of the First National Condor Census indicate that the largest population of the bird in Colombia is found in the northeastern páramo complex, with a high number of registers

from adults and juveniles in Santander and Norte de Santander (Figure 10) (Fundación Neotropical, 2021). Although there is not a robust baseline to compare these results with and it is not possible to determine if local initiatives have played a role in the results, condor populations are safe while transiting through El Almorzadero's section of their corridor, which constitutes a significant outcome of the initiative.



Figure 10. Two juveniles and one adult sighted in one of the member's farms during the First National Census of the Andean Condor. Photo taken by Ia3 in February 2021.

As of now, the social benefits of this CBCI stand above the ecological outcomes. The innovations and changes seen in farms and the current motivations and perceptions of members indicate that there is potential for strong biodiversity conservation outside of the national park system: a type of conservation and resource management built upon the principle of social inclusion.

6.2. Navigating through highs and lows

Interviewing different actors that are familiar with *Acamco* was very useful to have a broader understanding and gather several perspectives on what each considers the main hindering and enhancing factors of the initiative. I summarized the main findings from these conversations using a SWOT (strengths-weaknesses-opportunities-threats) analysis (Figure 11).



Figure 11. *Acamco's* SWOT analysis summarizing the findings of this thesis.

I compared findings on the strengths of *Acamco* with aspects that have been determined as enhancing for CBCIs from systematic reviews (Brooks et al., 2013; Ruiz-Mallén & Corbera, 2013) and literature on the importance of recognizing and adapting conservation projects to local contexts for the success of conservation (Waylen et al., 2010). One of the main common enhancing factors of these initiatives is the active and effective participation of local leaders and institutions that contribute to sustainable practices while maintaining cultural traditions. NGOs and research institutions have been exceptionally helpful in enhancing and creating social capital and contributing to the technical formation of community members through courses on improved agricultural practices with SENA, environmental education with PJD, and contribution as researchers on projects with local universities. These circumstances have not only increased motivation and knowledge of the ecosystem but have encouraged pro-sustainability behaviors in an area where it was not common. While the literature suggests that bottom-up approaches have weaker agency (Fischer & Newig, 2016), *Acamco's* model of governance, partnership with institutions, and collaborative work through *mingas* have been significant for increasing the agency of their group in stablishing biodiversity conservation as a mainstream goal in the area.

On leadership, an aspect that enhances success of community initiatives and self-governance is decentralized decision-making and effective consultation (Andersson et al., 2020). I asked interviewees about their voice in the community, and they all responded that their opinions and priorities are always considered. I attended several meetings with *Acamco's* leader, who never made any decisions without sending a message and opening voting for all members. These findings support that unselfish leadership, and joint and decentralized decision-making are present in *Acamco* and have been crucial for minimizing tensions and guiding goal achievement. They are also key components for increasing

the legitimacy of community-initiatives and their possibilities for achieving change outside the local level (Andersson et al., 2020; Campbell & Vainio-Mattila, 2003; European Environment Agency, 2018), therefore enhancing the influence of this CBCI as a transition towards sustainability.

Another aspect highlighted through my research in El Almorzadero is that community participation has been considered since the beginning of the process until now. Even when the initiative was led by an NGO, community members were present at every stage (project design, implementation, and monitoring). This has created a feeling of ownership and belonging to the association—one that would be absent otherwise. Spaces for learning have been opened thanks to this initiative, with instances of networking in which members have been able to retell their experiences in congresses, fairs, and in other regions of the country. Participation has also strengthened community building, with trust and collaboration not only shared between members, but with NGOs, local institutions, and universities, all considered important stakeholders by the literature (Brooks et al., 2013; Zyambo, 2018). However, the weak and sometimes conflicting relationship of *Acamco* with local governmental offices detracts somewhat away from its enhancing aspects.

Beyond the common factors for success established in the literature (Brooks et al., 2013; Waylen et al., 2010), I determined that the context in which this initiative started has had the biggest influence on its outcomes. During field work I heard several owners concerned with the legal status of their land tenure. All members of *Acamco* are the legal owners of their farms. Their concern comes from the fact that in most cases, the real area of the property does not match the area stipulated in the property document. This is the result of old legal rights which did not require accurate topographical definition. However, this issue can be solved by correcting the area with the help of a topographer, something that members are already planning to do. With that correction, all farms of this community will have updated legal rights, something that could differentiate this CBCI from others. Having this security on land tenure also provides owners with the capacity of taking risks, deciding how to manage their areas, and, all in all, becoming members of this kind of initiative. Combined with support from academia and NGOs from the start, and a community where members were already familiar with each other, the local context of the families in Cerrito who own farms in El Almorzadero allowed their initiative to consolidate into what it is today and to gain strength since its beginning.

In their systematic review, Brooks et al. (2013) conclude that national context is not a determining factor for CBC success. They mention that a community-based conservation project which includes “emphasis on community participation, capacity building, and equitable distribution of economic benefits” (Brooks et al., 2013, p. 28) can overcome challenging aspects such as corruption, weak institutions, and poor regulatory quality. In the case of Colombia’s páramos where legislation has been

very prohibitive and the effects of armed conflict have determined how populations relate with governmental institutions, a community project with emphasis on participation may not be enough to overcome those challenges. These circumstances have left deep distrust regarding associativity and collaboration with the state, a factor that is holding *Acamco* back by limiting their network and indirectly creating conflicts with the community through the misunderstandings caused by the páramo law. Some people in Cerrito are willing to take the risk of joining the initiative following the example of and learning the progress made by other members, but many are unwilling to participate due to the aforementioned aspects. As of now, it seems like there is no reverse for the páramo law. And although it was weakly shared with communities and its implementation has been problematic, it will still be implemented in the area. The farmers of El Almorzadero should voice their concerns through effective dialogue, which entails a more open relation with their local governments and environmental authorities.

Close collaboration with NGOs is undoubtedly an enhancing aspect that has contributed with technical support, leadership, networking, and economic aid. However, while doing my research I wondered if this close relationship was becoming a dependency, and if it could generate negative effects in the future. When I set a scenario for PJD employees where they had to retire from the association, they responded by saying that their absence would immediately weaken the association since they are key players in the local context. A big challenge remains in enhancing appropriation of the process and using the local social capital to sustain progress over time. Additionally, *Acamco* and PJD are currently fulfilling tasks of planning, managing, and monitoring natural resources in the area, a responsibility that should be led by the environmental authority (CAS). This makes local governance more participatory and has the potential to close the gap between civil society and the state. But at the same time, the environmental authorities and governmental institutions will continue to create laws and enforce them, regardless of who is putting in the practical work for conservation. This is an occurrence in which a hindering aspect needs to be considered carefully to minimize possible future negative outcomes.

6.3. Learning and experimenting to broaden conservation

6.3.1. Lessons from other contexts

Comparing the main enhancing and hindering aspects of *Acamco*'s process with those of other CBCIs is useful to identify trends and apply these insights to the general field of conservation. In the region, an initiative to study several CBCIs took place between 2003 and 2012 under the Andean Páramo Project, a collaborative effort between Venezuela, Colombia, Ecuador, and Perú. Researchers determined that civil society initiatives for conservation have increased in páramos, mainly led by

women (Crespo, 2012). The main aspects that have contributed to collaboration for páramo protection and sustainable land use were alliances with governmental and non-governmental institutions, a shared common vision among participants, participative mapping, and establishment of technical baselines (Crespo, 2012). They also concluded that one of the most effective practices that contributed to biodiversity conservation was fencing lagoons and delicate vegetation areas to avoid disturbances (Crespo, 2012), a practice that is already part of *Acamco's* toolbox. Lessons from this project to implement in El Almorzadero and to other CBCIs in páramos and in the Andean region are: communication and networking should not only be limited to institutions, but also to other CBCIs that offer valuable and innovative examples; expanding the reach of the initiative to other Andean ecosystems is important since the socio-ecosystem boundaries of páramos are very diffuse, with impacts sometimes reaching anywhere from lower altitude forested areas to the snow covered peaks of the Andes. CBCIs are communities of practice and pilot sites, and although there are limited opportunities for systematic change in how biodiversity conservation is carried out at a national level, leading through example is a step towards a significant change at local, and even regional levels, therefore effectively transitioning towards more sustainable land and resource use management.

Outside of South America, several CBCIs in Africa have been the subject of research. In Southern Africa, Zyambo (2018) reported that CBCIs had limited success because of the weak land and resource tenure, weak community institutions, and poor governance—all factors that have undermined participation, decision-making, and ecological and economic benefits (Zyambo, 2018). These aspects are in contrast with the experience in El Almorzadero, where they are the main strength of *Acamco*. In the region of Wild Coast, South Africa, opposition from outside the community has been the main hindering factor (Masterson et al., 2019). They conclude that “community counter-narrative is successful in stalling the project which illustrates the importance of considering the plurality of meanings for interventions to be sustainable in the long term” (Masterson et al., 2019, p. 1). This opposition is similar to the one in El Almorzadero, where my findings suggest that efforts to alleviate tensions with the opposition have been limited. Therefore, it is imperative to find resolution by first understanding what the sources of the opposition are and having a fruitful dialogue to tackle them.

In Nepal, Community Forestry has been regarded as one of the most successful community programs for biodiversity conservation in the country thanks to innovative practices and action-based solutions, mainly using silvicultural activities as substitute of forest management and involving women in community forestry practices (Acharya, Goutam, Acharya, & Gautam, 2006). The biggest take away from its evaluation is that inconsistent understandings of biodiversity conservation and community priorities could delay success by changing program goals (Acharya et al., 2006). This is an important

lesson for El Almorzadero, where interviewees were aware of the importance of conservation but were often doubtful about actions that could contribute to its accomplishment.

6.3.2. *Placing an example in the transition*

Acamco is a multi-actor collaborative process built around innovation, experimentation, learning, and iteration, all characteristics of action-oriented transitions (Steward, 2018) that make this initiative an important contributor to conservation of the ecosystem through sustainable management. The approach of this community captures all aspects of sustainability by applying management and productive practices that reduce environmental impacts, involve civil society, and maintain the resources that in most cases are the only source of income for families. This local initiative has catalyzed change in the cultural values of Cerrito, changing the perception of the condor and placing the páramo at the center of the town's image and concerns. Interviewees believe that being a successful example of how to balance production and conservation will be sufficient to achieve macro-scale change in the governance of biodiversity. However, the lack of coherence between community participation and ecosystem protection shown in Colombia's ecosystem management is an obstacle for this goal. In this context, the possibility to successfully manage the transition still depends on national actors.

One of the main lessons from El Almorzadero case study is that a community is not homogeneous. This is a generalization often applied to research of CBC and in national plans seeking participation. There are several priorities and interests to balance when designing and setting the goals for an initiative. There are still many questions about whether this association is representative of the large community of Cerrito. Thus, creating mechanisms that amplify participation and setting spaces for dialogue is fundamental for any CBCI in order to increase agency and transformative capacity (Fischer & Newig, 2016; Loorbach et al., 2017).

Through my findings and research, it is evident that institutional support is fundamental and necessary. But the nature of those alliances between civil society and institutions is a determining factor: communities need to be as active in decision-making and project design and implementation as other stakeholders. Participation shouldn't be limited to tokenism, but increased to partnerships and delegation (Arnstein, 1969). Furthermore, collaborations should not be limited to academia and NGOs, but expanded to the state, who is responsible for setting and applying rules and policies. Collaborating with governmental institutions and environmental authorities will ultimately enable the transition towards sustainability by setting appropriate frameworks and fair approaches to conservation.

Any CBCI has the potential of bringing the premises of sustainability into reality at larger levels if an example is set through actions and results. This became evident when talking to the most recent members of *Acamco* and other citizens of Cerrito. At the beginning they were afraid of taking a risk, but now that they have seen the modifications of farms and the extent of change in the ecosystem, they are more likely to join, showing that time and progress are important variables to consider. Finally, placing the importance of a local ecosystem in a broader context is an under-discussed enhancing aspect of CBC in any context. For members of El Almorzadero, a trigger for changing their mindset were the first environmental education campaigns that highlighted the importance of páramos as providers of water for the country and seeing the location of their farms in maps of corridors for wildlife across Colombia and South America. It helped farmers understand their role and accept the responsibility as managers of this fragile ecosystem. The principle can be extended to any location, type of landscape and context. Conceptually moving the importance of local protection to a broader level will aid as a catalyzer of change.

7. Recommendations and further research

Acamco still faces multiple challenges that could be alleviated by generating ecological and social indicators approved by the community that evidence the outcomes of the initiative and that can help them monitor progress and take actions for improvement. Within the association, work should be focused on relieving tensions between members by openly communicating conflicting opinions. Regardless of prejudices and past conflicts, a collaborative relationship with environmental authorities is beneficial for the community. They oversee the legislation of the area and are integral for the protection of leaders and members; joining knowledge and having open communication spaces will ultimately benefit the ecosystem.

My research would have benefited by including interviewees from the opposition, whose perspectives are a valuable contribution to the search for ways to achieve deeper change in the region. The reasons for opposition I exposed in my findings are retellings from association members, so obtaining them from the direct source is an important contribution for further research. It would also be useful to explore how the management plans that have been written for farms in the process of becoming natural reserves could be used as public policy tools and as inputs for planning in the region, even as a contribution to the design of the páramo law. Finally, research of CBC in Colombia has been very limited, with few examples being explored. Comparative analysis between initiatives in other regions or ecosystems are essential tools to outline a framework in which community conservation can be integrated into the national governance of biodiversity.

8. Conclusion

I presented the case of *Acamco*, a CBCI in El Almorzadero páramo, Colombia, under the premise of coexisting with the condor, a species that caused conflicts in the area. This original goal of the CBCI has developed further and now encompasses the protection of the ecosystem by using sustainable practices for agricultural production and livestock raising that can reduce the anthropogenic impacts in the area while still maintaining people's livelihoods.

I discussed the partial ecological and social outcomes of this initiative, concluding that the latter have been more significant—mainly due the limited baseline information to compare with and the short time since interventions started. However, the social benefits do not undermine the current and potential outcomes for biodiversity conservation.

I identified the main opportunities and challenges for this initiative. *Acamco* has accomplished significant progress in El Almorzadero, with the potential for increasing in size with new members joining, a growing institutional network, and increased commitment from the community. The most notable aspects that have permitted the growth of this association is the active participation of community members in all phases of project implementation, and a context where farmers are rightful owners of land, which allows them to modify their practices and deal with the risk of trade-offs. There are several obstacles to overcome, some of which need to be urgently resolved such as increasing communication among members to reduce internal conflicts. Others will take more time, especially finding ways to reduce opposition through example-setting and clearing up misconceptions and strengthening relationships with governmental institutions. *Acamco* showcases a set of characteristics that make it an appropriate example of a transition based on actions and results in a socio-ecological system.

Colombia is a megadiverse country with unique ecosystems that require special protection. Development plans and conservation strategies have highlighted the important role of communities in managing and conserving resources and biodiversity in these areas. However, in practice this premise is often reduced to prohibitionist approaches and laws designed without considering local contexts. Community-based conservation is appropriate as a transition towards the sustainable management of páramos in Colombia. *Acamco* has become a pilot of self-governance by integrating production and conservation through action and changes of environmental perception. The characteristics of each community and ecosystem are unique, but there are certain aspects such as institutional support, clear goals, sharing of knowledge, and strong leadership that constitute the base of what a successful CBCI is. Although my research was limited to a group of 19 families, the influence they have had in their context thus far is an example of what potentializing those characteristics with

support from the government and environmental authorities could contribute to sustainability in the country.

9. References

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Appendices

Appendix 1.

Semi-structured interview guide

Introducción

Mi nombre es María Daniela González, estudiante de maestría de sostenibilidad y estudios ambientales en la Universidad de Lund, Suecia. En este momento me encuentro haciendo la investigación para mi trabajo de grado acerca de iniciativas comunitarias para la conservación de la biodiversidad en Colombia. Voy a hacer algunas preguntas con el fin de entender el proceso comunitario de conservación en el Cerrito y los factores que contribuyen o dificultan su éxito. ¿Está de acuerdo en responder estas preguntas? En cualquier momento puede detenerme y no está obligado a responder una pregunta si no lo desea. Cuando procese los datos protegeré su identidad y le comunicaré mis resultados.

Guía para miembros de la asociación

Información general

- Nombre
- Edad
- Municipio
- Vereda

Conceptos generales

1. ¿Qué entiende usted por biodiversidad?
2. ¿Qué tipo de acciones contribuyen a la conservación de esa biodiversidad?
3. ¿Cree usted que este páramo es un lugar con gran biodiversidad?

Sobre la asociación

4. ¿Hace parte de alguna asociación con objetivos de conservación?
5. Si es así, ¿desde hace cuánto tiempo?
6. ¿Qué lo motivó a convertirse en miembro de la asociación?
7. ¿Cuáles eran sus expectativas al unirse?
8. ¿Consideraría que algunas de sus motivaciones o expectativas han cambiado con el tiempo?
9. ¿Cuáles cree que son los aspectos positivos de ser miembro de la asociación?
10. ¿Cuáles pueden ser algunos aspectos negativos, conflictos o desafíos que tenga o haya tenido por ser miembro?

Sobre su relación con el ecosistema (predio, reserva, etc)

11. ¿Hace cuánto habita/trabaja en el páramo?
12. ¿Cómo definiría su relación con el páramo?
13. ¿Esta relación ha cambiado de alguna manera desde que se volvió miembro de la organización?

Sobre participación, comunidad e instituciones

14. ¿Se reúne regularmente con otros miembros de la comunidad?
15. ¿Cuáles son algunas fortalezas o debilidades del trabajo en comunidad?
16. ¿Siente que su participación es valiosa, que su voz es escuchada en la toma de decisiones?
17. ¿Cuáles instituciones han realizado visitas a su predio con objetivos de planeación o conservación? Si es así, ¿Cuáles considera que han sido sus contribuciones? ¿Han tenido conflictos? (ONGs, universidades, CAS)
18. ¿Qué cree que hace falta para que iniciativas como la que se llevan a cabo en este páramo ganen más importancia a nivel regional y nacional? ¿Cuáles son los desafíos?

Guía para miembros de instituciones

Información general

- Nombre
- Edad
- Organización

Conceptos generales

1. ¿Qué entiende usted por biodiversidad?
2. ¿Qué tipo de acciones contribuyen a la conservación de esa biodiversidad?
3. ¿Cree usted que este páramo es un lugar con gran biodiversidad?

Sobre la organización

4. ¿Cuál es su cargo dentro de la organización? ¿Desde hace cuánto tiempo lo desempeña?
5. ¿Cuáles son los objetivos de la organización?

Sobre el ecosistema

6. ¿De qué manera se vinculó la organización con el páramo?
7. ¿Desde hace cuánto tiempo?
8. ¿Cómo cree que la organización trabaja para contribuir a los objetivos de conservación del páramo?
9. ¿Cuáles son los aspectos que facilitan y desafían el trabajo en el páramo?

Sobre participación y planeación

10. ¿Cómo se relaciona la organización con los miembros de la comunidad? (¿Tienen objetivos en común? ¿Se reúnen regularmente? ¿Cuáles son algunas fortalezas o debilidades del vínculo?)
11. Además de la organización para la que trabaja, ¿qué otras considera relevantes para la planeación y conservación del páramo?
12. ¿Qué cree que hace falta para que iniciativas como la que se llevan a cabo en este páramo ganen más importancia a nivel regional y nacional? ¿Cuáles son los desafíos?

Guía para expertos

Información general

- Nombre
- Perfil

Sobre la organización

1. ¿Hace cuánto tiempo trabaja con el tema de los páramos?
2. ¿Cuál es su cargo dentro de la institución? ¿Desde hace cuánto tiempo lo desempeña?
3. ¿Cuáles son los objetivos de la institución?

Conceptos generales

4. ¿Qué tan importante es el rol que tienen las comunidades en la protección de la biodiversidad?

Sobre el ecosistema

5. ¿Cuáles son los mayores desafíos en la protección de los ecosistemas del páramo?
6. ¿Existen algunos factores que faciliten la conservación?

Sobre políticas e institucionalidad

7. ¿Cómo ha evolucionado la aproximación hacia la conservación de estos ecosistemas?
8. ¿Por qué se han dado dificultades a la hora de integrar a las comunidades en la conservación de estos ecosistemas?
9. ¿Qué tan fundamental ha sido el rol de las instituciones privadas y públicas en la conservación? ¿Han creado conflictos? ¿Han facilitado los procesos?
10. ¿Cuál cree usted que es el esquema de conservación más adecuado en el contexto colombiano?
11. ¿Qué cree que hace falta para que iniciativas como la que se llevan a cabo en este páramo ganen más importancia a nivel regional y nacional? ¿Cuáles son los desafíos?
12. Muchas personas han expresado sus preocupaciones frente a la ley de páramos. ¿De dónde viene esta preocupación? (Malentendidos, desconfianza, falta de socialización, relaciones históricas con leyes e instituciones...)

Appendix 2.

Interviewee information

Association Members					
Code	Date	Age	Sector where property is located	Aprox. Property Area (ha)	Time in the association (years)
Am1	16/02/21	56	Mortiño	250	3
Am2	16/02/21	42	Mortiño	259	4
Am3	16/02/21	16	Cruz de Piedra	10	4
Am4	16/02/21	11	Cruz de Piedra	10	4
Am5	16/02/21	35	San Pablo	x	2
Am6	17/02/21	25	Cruz de Piedra	25	4
Am7	17/02/21	19	Cruz de Piedra	x	4
Am8	17/02/21	45	Cruz de Piedra	25	4
Am9	17/02/21	36	Cruz de Piedra	8.8	4
Am10	17/02/21	34	Cruz de Piedra	10	4
Am11	17/02/21	36	Cruz de Piedra	10	4
Am12	18/02/21	11	Tachiva	x	4
Am13	18/02/21	69	Tierra Negra	79	1
Am14	18/02/21	63	Tierra Negra	79	1
Am15	18/02/21	30	Tachiva	x	4
Am16	18/02/21	59	Tachiva	30	4
Am17	18/02/21	52	Tachiva	30	4
Am18	19/02/21	39	San Pablo	340	2

x: Not property owners but family is part of the association.

Institutional Actors					
Code	Date	Type of Institution	Institution	Position	Time in institution or in the area (years)
la1	18/02/21	Local Government	Mayor's Office	Culture and tourism director	2
la2	19/02/21	Local Environmental Authority	CAS - Corporación Autónoma de Santander	Regional director	6
la3	22/02/21	NGO	Parque Jaime Duque, formerly SENA*	Sustainable production coordinator	1, 8*
la4	23/02/21	NGO	Parque Jaime Duque	Environmental education coordinator	1
la5	23/02/21	National Administration	Ministry of Science, Technology and Innovation	A <i>Ciencia Cierta</i> initiative facilitator	3
la6	02/03/21	National Administration	Ministry of Science, Technology and Innovation	Coordinator of the social appropriation of knowledge group and A <i>Ciencia Cierta</i> initiative leader	3

Environmental expert		
Code	Date	Profile
Ee1	01/03/21	International Conservation. Working in conservation strategies in páramos and other ecosystems. Contributed to the páramo delimitation map creation.