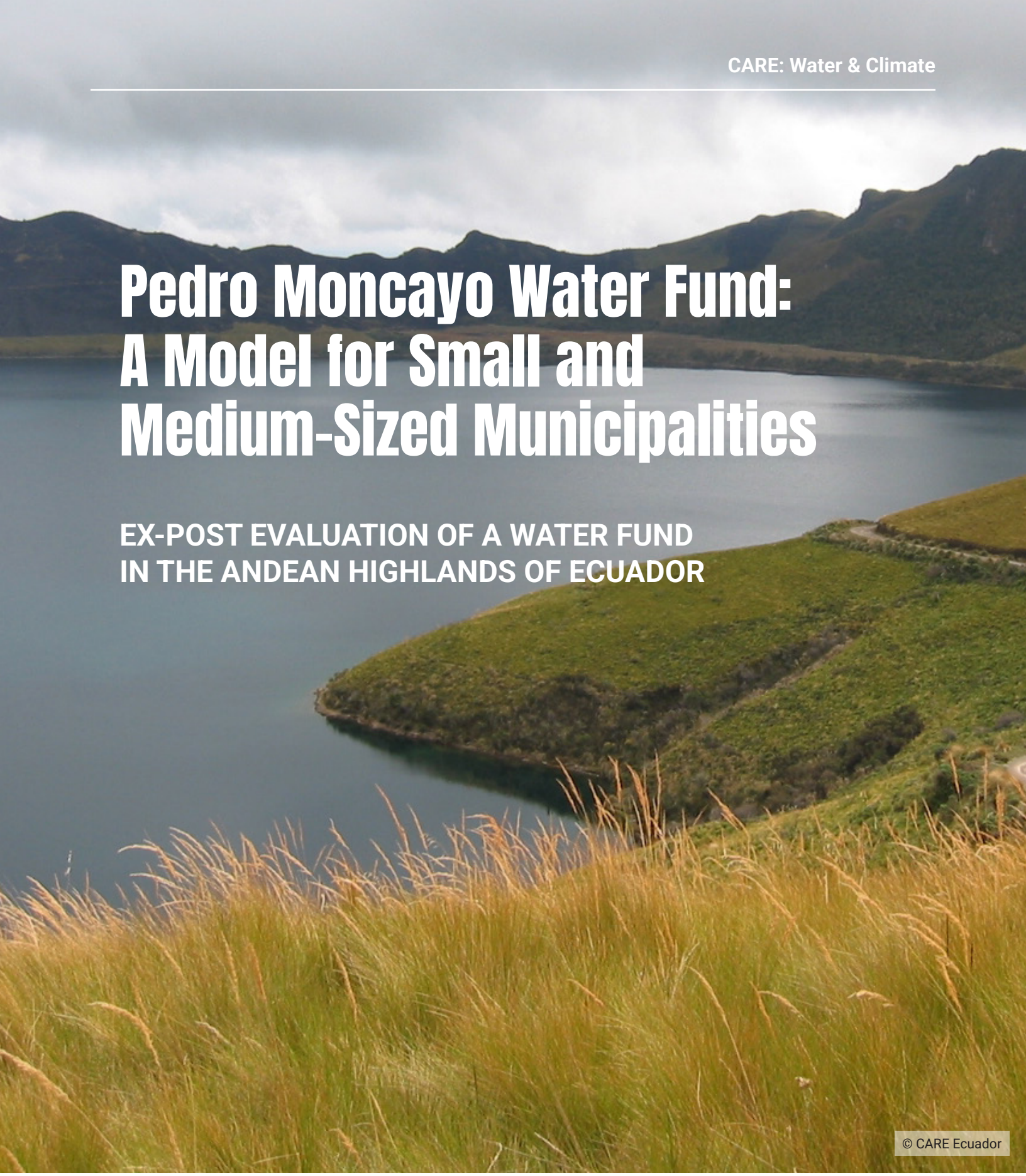
Pedro Moncayo Water Fund: A Model for Small and Medium-Sized Municipalities

EX-POST EVALUATION OF A WATER FUND IN THE ANDEAN HIGHLANDS OF ECUADOR



Acronyms

ACUS	Conservation and Sustainable Use Area
ACCRE	Climate Change Adaptation Project for Andean populations through the management, conservation and restoration of páramos in Pedro Moncayo.
APH	Water Protection Area
CARE	Cooperative for Assistance and Relief Everywhere
CODEMIA	Development Consortium of Integrated Management of Water and Environment - Cayambe Pedro Moncayo
ECOLEX	Environmental Law and Management Corporation.
EMASA-PM	Empresa Municipal de Agua, Saneamiento y Alcantarillado (Municipal Water, Sanitation and Sewerage Utility)
FONAG	Environmental Fund for Water Protection in the city of Quito.
FONAPA	Water Fund of the Paute River Basin
FORAGUA	Regional Water Fund and Environmental Fund made up of several cities in southern Ecuador.
FONDAGUA	Guayaquil Water Fund for the conservation of the Daule river basin.
GAD-PM	Decentralized Autonomous Government
JAAP	Drinking Water Management Boards
MAATE	Ministry of Environment, Water and Ecological Transition
PDyOT	Development and Land Management Plan
PSH	Payment for Water Services
SENAGUA	National Water Secretariat
UCIBIT	Union of Indigenous Communities and Neighborhoods of Tabacundo
TURUJTA	Tupigachi Runakunapak Jatun Tantanayakuy
UCCOPEM	Union of Peasant and Indigenous Organizations Cochasquí - Pedro Moncayo.
VIPP	Visualization in Participative Programs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Executive Summary

Background

Water is essential for socioeconomic development, food production, ecosystem health, overall well-being, and is key to climate change adaptation. In South America, the Andes Mountains are crucial for water supply, but climate change and unsustainable practices often driven by poverty have increased water insecurity. Despite rich biodiversity and ecosystems, Ecuador faces serious water security challenges, especially in the páramo, high altitude grasslands that provide critical water resources and ecosystem services. Páramos capture and retain water, and deliver water to communities and downstream urban centers. Ecuador is home to 13,371 km² of páramo. However, this ecosystem has been degraded by human activities and global climate change, leading to increased risk of fires and a decrease in water availability.

Since 2016, CARE Ecuador has worked with local government, public water utilities and communities in the Andean region to increase adaptive capacities of communities, scale agroecology practices with women producer groups, and protect and restore the páramo ecosystem. As part of this support under the Adaptation to Climate Change for Andean Populations - ACCRE (2016-2019) and Mujeres Andinas (2021-2024) projects, CARE and local partners established and supported the startup, creation, and ongoing implementation of the **Pedro Moncayo Water Fund (2016 - present). This water fund is a public-community managed fund that generates resources to protect and restore the municipality's páramo and ensure the sustainability of water** for 200,000 people**.** CARE is currently scaling this model to three other municipalities under its Mujeres Rurales project (2024-2027).

In 2025**,** CARE conducted an ex-post evaluation to document the process history of the water fund, analyze its effectiveness and sustainability, and identify recommendations for the Pedro Moncayo municipality and considerations for scaling the model to other municipalities in Ecuador. Recommendations and conclusions also inform

CARE's global work as small to medium scale conservation financing mechanisms like water funds are an important strategy to protect and restore water resources and generate co-benefits for livelihoods, nature, and people.

> **A water fund is defined as a "water governance model of collective action and innovation that promotes solutions so that local governments and their inhabitants can provide themselves with water for consumption in quality and quantity through the implementation of conservation, maintenance and recovery measures for water-supplying ecosystems to guarantee their adequate systemic functioning in the long term, and ensure water production for present and future generations."**
>
> **(Latin American Alliance of Water Funds, 2020)**

Context

Ecuador is a pioneer in the creation of water funds, starting with the Environmental Fund for the Protection of Water in Quito (FONAG) in 2000, designed to protect the city's drinking water sources. This model has been replicated in other territories in Ecuador and in several Latin American countries, where there are currently around 30 water funds.

These water funds operate off a variety of governance models and revenue sources. For example, the Tungurahua Fund in central Ecaudor is a public-endowment model whose interest feeds a revolving fund while other funds like FONAG operate under a public-private endowment model that receives funding from water user fees collected by public utilities as well as contributions from private companies and international donors.

The Pedro Moncayo Water Fund (PM Water Fund) is operated as a public-community model that includes participation of the municipal government (Gobierno Autonomo Decentralizado de Pedro Moncayo - GAD-PM), the public water utility (Empresa Municipal de Agua, Saneamiento y Alcantarillado Pedro Moncayo - EMASA-PM) and community. The fund is financed through a 5% contribution of yearly revenue from water user payments to the public water utility. As of 2025, the PM Water Fund has generated approximately $300,000. The PM Water Fund's mandate is to finance conservation and restoration activities in the páramos and promote sustainable land and water management practices, which are critical for ensuring the availability of water for downstream communities and livelihoods.

The PM Water Fund was established in parallel to the legal protection process for two conservation areas also established by the Pedro Moncayo municipality and national government of Ecuador with support from CARE. The **Mojanda Conservation and Sustainable Use Area (Área de Conservación y Uso Sostenible - ACUS)** declared in 2019 protects the Mojanda Lake Complex, a series of freshwater lagoons and páramos that covers 6,000 hectares and supplies water to 200,000 people in the Pedro Moncayo municipality. The **Mojanda Water Protection Area (Área de Protección Hídrica Mojanda - APH)** was declared in 2021 and is a national-level declaration that specifically protects the freshwater ecosystems within the Mojanda ACUS – strengthening legal protections for water resources inside the ACUS. The ACUS and APH each have their own management structure and committee which manages the governance and administration of these legally protected areas. The ACUS and APH created a landscape-based conservation framework for the PM Water Fund to jointly and more effectively coordinate, plan, and finance conservation activities.

Results

The ex-post evaluation used participatory research methodology, including focus groups and semi-structured interviews with local partners and stakeholders, as well as direct observation to validate the information. Key results included:

Mapping of PM Water Fund process (2016-2019): The PM Water Fund was legally established in 2019 by a municipal ordinance. However, the process to establish the fund took place over three years between 2016 and 2019. The first two years included technical studies, feasibility assessments, and workshops to design its management structure and financial model. This part of the process required intensive stakeholder engagement and consensus-building. The review, socialization, and approval of the municipal ordinance (legal instrument that formally established the fund) took nearly a year and was aligned with the establishment of the Mojanda ACUS. This phase relied on the strong political will and leadership of the mayor.

The final phase in 2019 established the **Water Fund Management Committee (WFMC)**, operationalized the municipal ordinance, and activated the disbursement of funds from the public water utility to the PM Water Fund. However, this phase encountered challenges as it coincided with municipal elections and subsequent turnover of municipal staff. As is common in Ecuador, new mayoral administrations revise political and development agendas and tend to de-prioritize actions under previous mayors. This paused progress of the PM Water Fund and prevented the use of the funds for conservation activities.

Water Fund Form and Structure: The structure of the PM Water Fund is legally defined by the ordinance approved in 2019. The fund has a public-community governance structure and is managed by the Water Fund Management Committee, which includes the mayor and environmental technical staff from the municipality, the manager of the public utility and one representative from civil society. The WFMC's role and responsibility is to conduct quarterly review meetings, develop annual plans and budgets, conduct monitoring and evaluation of conservation activities, and facilitate information sharing and feedback with local authorities and citizens. The PM Water Fund's management plans and strategic vision are intended to align with those of the ACUS and APH to ensure a cohesive and coordinated implementation of conservation and nature-based solutions in the municipality.

The study identified key structural gaps within the WFMC, particularly around expanding participation of community-based structures beyond just one representative from civil society. Some key actors missing include the community-managed Drinking Water Management Boards (Juntas Administradoras de Agua Potable – JAAP) as well as women's producer groups and irrigation user groups.

Operation of the PM Water Fund: Although the PM Water Fund has a clear mandate and strong institutional and legal framework, the WFMC faces operational challenges, and no funds have been disbursed for direct implementation of activities. Although the public utility fulfilled its yearly financial commitment (5% of revenue), approximately $300,000 raised since 2019 sits unused (but ringfenced) within the public utility's bank account. The WFMC has been inactive since 2019 which has stalled quarterly meetings, coordination with the ACUS and APH, and yearly planning and budgeting cycles.

The key bottlenecks preventing the disbursement of funds identified by the study were concerns around transparency in the use of funds and lack of formal and legal agreement between the municipality and the public utility that delegates decision-making and approval of plans and finances to the WFMC. Although the municipal ordinance already assigned this responsibility to the WFMC, it requires an additional instrument to institutionalize and formalize responsibility. As an aside, the study noted that the municipality does provide ongoing leadership and funding to conservation activities in the páramo through other budget sources. Women's producer groups have also continued practicing agroecology and other conservation-based activities.

Sustainability: The sustainability of the Water Fund continues to be a challenge due to its reliance on the 5% yearly contribution by the public utility as a singular revenue source – highlighting a need for more diversified contributions from other sources. There are promising signs, however, as invested stakeholders who rely on the health of the páramo, such as Drinking Water Management Boards (JAAP), Irrigation Committees and Flower-exporting (floriculture) companies, have expressed interest in contributing to the fund.

Communication and public awareness: In addition to the structural and operational challenges discussed above, the study noted that public awareness of the PM Water Fund, ACUS and APH is low and that citizens have a limited understanding on the importance of protecting and restoring the páramo as a direct way to improve access to water for drinking and agriculture.

Conservation framework at landscape level: The PM Water Fund has a unique potential for impact thanks to the establishment of the ACUS and APH conservation mechanisms, which have created a protected area of 6,000 hectares in the Mojanda Lake System. However, the bottlenecks to using the PM Water Fund's existing balance must be overcome and going forward the annual planning of the Water Fund, ACUS, and APH should be conducted jointly to better coordinate activities and budgeting.

Conclusions and Recommendations

Key conclusions include:

Water funds are viable solutions but require several years of commitment and significant financial/ technical investment from a range of stakeholders. The Pedro Moncayo Water Fund is presented as a viable solution for small and medium-sized municipalities (40,000 – 150,000 people) seeking to establish conservation financing mechanisms. The process is dynamic and complex and requires 2-3+ years of assessments of technical, financial and institutional feasibility, stakeholder engagement, consensus-building, and drafting and review of legal mechanisms. Government elections and turnover have stalled progress.

Water funds should be created, planned, and managed in coordination with conservation mechanisms to increase impact. The joint and coordinated establishment of the PM Water Fund, the Mojanda ACUS, and the APH provide a framework for an integrated model of high-altitude landscape conservation in Ecuador that finances the protection and restoration of the páramo and Mojanda Lake complex to ensure water availability for drinking and agriculture and protect ecosystem health and biodiversity.

Water funds need sustained political will, clarity, and legal agreements on roles and responsibilities around use of funds and financial transparency. The PM Water Fund has a clear mandate, strong legal and institutional framework, and has raised approximately $300,000 as of March 2025. However, a lack of political will and a need for clarity and legal agreement on roles and responsibilities around use of funds and financial transparency between the municipality and the public utility have limited the WF Management Committee's ability to plan, budget and disburse funds for conservation and restoration activities in the páramo. This highlights the need for ongoing technical support, including legal, to help resolve bottlenecks.

Women, particularly Indigenous women, are often leaders in local water stewardship actions, custodians of ancestral and place-based knowledge about the location and protection of water springs and play the primary role in collecting and using water at the household level. Women play a crucial role in the conservation of water resources, although they are often underrepresented in decision-making spaces. Their engagement in conservation processes is fundamental to implementing effective actions, and it is necessary to promote their participation in the governance of the Water Fund.

Key lessons learned and recommendations include:

Lesson Learned - Legal and regulatory challenges often require support from a legal advisor. Recommendation - Urgently develop a regulation for the PM Water Fund's municipal ordinance that formally outlines roles and responsibilities between the WFMC, the municipality (GAD-PM) and public utility (EMASA-PM) and formally delegates planning and financial decision-making to the WFMC and the use of a separate PM Water Fund bank account managed by the WFMC. Although the municipal ordinance of 2019 dictated this role to the WFMC, the GAD-PM and EMASA-PM require a legal instrument to ensure compliance. To address legal and regulatory challenges, future water funds should consider a temporary or permanent legal advisor.

Lesson Learned - Water fund structures must prioritize voices and participation from underrepresented water user groups. Recommendation - Amend the structure of the WFMC to include representatives from other community-level actors and consider participation from the private sector, such as the floriculture companies. Among the community-level actors, it's important that the Drinking Water Management Boards (JAAP), women's producer groups and irrigation actors join the WFMC. The WFMC will need to implement a participatory and rigorous process to select the form and function of the private sector's participation, and ensure that the meaningful participation of women's producer groups and other underrepresented groups.

Lesson Learned - Water funds need to be understood and valued by their stakeholders and beneficiaries. Recommendation - Conduct communication campaigns and other awareness activities to improve public education and increase understanding of the PM Water Fund and the ACUS and APH.

Lesson Learned - Water funds, conservation mechanisms, and climate adaptation processes mutually benefit from better coordination. Recommendation - Improve cohesion and coordination between the PM Water Fund and the ACUS and APH to ensure more integrated land-use planning. More specifically, the PM Water Fund's annual plans should be coordinated and integrated into the territorial planning at the municipal level, and provincial levels. In addition, the Mojanda ACUS and APH's annual plans should be binding on the Water Fund, ensuring its inclusion in the municipality's Development and Land Use Plan. The Water Fund should also be linked to local, regional, and national adaptation processes, such as Nationally Determined Contributions and National Adaptation Plans that increasingly prioritize the role of ecosystem-based solutions in climate adaptation.

Lesson Learned - Long-term revenue generation strategies are key to the sustainability of water funds. Recommendation - Diversify the PM Water Fund's revenue sources beyond the annual contribution of the public utility. To develop a resource generation strategy, the WFMC would benefit from financial modeling and projections that can help inform decisions and strategies that ensure the financial sustainability of the fund. Potential untapped sources include contributions from the Drinking Water Management Boards (JAAP) and Irrigation Committees as well as floriculture companies operating in the municipality – all having expressed interest. The WFMC should also consider establishing a privately-managed endowment to generate interest payments. This option is dependent on whether the municipality or partners like CARE can raise the initial capital investment. The search for contributors to the Water Fund must follow clear guidelines that define the participation, contributions and decisions of each partner or ally.

Key Factors of Success for Future Water Funds

Consider the context, specifically population, hydrology and ecology, and the policy and legal environment.

Conduct a thorough stakeholder analysis of all potential water users and partners.

Prepare an accurate timeline for the startup of a water fund.

Hire a permanent legal advisor.

Ensure that processes for the creation and implementation of water funds are done in a participatory manner, prioritizing the meaningful leadership of women.

Build capacities in the areas of water functionality, conservation and inclusive governance for all stakeholders.

Develop a clear legal framework, so the funds are delimited for conservation, restoration, and monitoring actions, according to established regulations.

Prioritize public education through ongoing communi-cation, outreach and awareness-raising, including simple and clear communi-cation materials.


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Introduction

Overview

Water is fundamental to socioeconomic development, food production, ecosystems and human well-being. Water is also a crucial part of climate change adaptation, and a critical link between people and nature (United Nations 2024). In South America, the Andes and other mountain ecosystems supply and regulate the region's water. Water insecurity has been exacerbated in the region due to competing needs of population growth and urbanization, industry, and agriculture, coupled with worsening drought cycles and receding glaciers due to climate change. In addition, climate change is expected to negatively affect water quality, due to increased temperature, reduced dilution of agricultural runoff during droughts, increased sediment and pollutant loads during heavy rains, and disruption of treatment facilities due to flooding.

Ecuador has a variety of natural landscapes that support vital ecosystems and rich biodiversity – from dense Amazonian rainforests to tropical dry forests, mangroves and the Andes Mountains. In the municipality of Pedro Moncayo, located in Pichincha province, the páramos – high altitude grasslands – provide water resources and critical ecosystem services for the population. Andean culture considers the páramo a "water factory" due to its sponge-like soil that stores water and slowly releases it to lower-lying areas. However, climate change, unsustainable land-use practices and inequitable natural resource planning increase risk of fires and threaten the páramo's ability to retain, regulate and provide water for people and food.

CARE has been in Ecuador for 63 years. CARE's programs work across sectors and focus on humanitarian assistance, women's empowerment and equality, community development, eliminating discrimination and all forms of violence, and sustainable solutions. A major component of CARE's work has been to reduce vulnerabilities to climate change, support and strengthen women's producer groups, and improve sustainable management and conservation of water and land resources. From 2016 to the present, CARE Ecuador has developed, strengthened and scaled an integrated management model for adaptation and conservation of high-mountain ecosystems in the Andes region across three projects: Adaptation to Climate Change for Andean Populations (ACCRE – 2016 – 2019), Mujeres Andinas (2019-2024), and Mujeres Rurales (2024-2027).

For these projects, CARE uses a landscape approach, which includes the development of innovative financing mechanisms that can guarantee resources and sustainability for the protection and restoration of the páramo ecosystem. As part of the ACCRE project, CARE, the municipal government (Gobierno Autonomo Decentralizado de Pedro Moncayo - GAD-PM), and the public water utility (Empresa Municipal de Agua, Saneamiento y Alcantarillado - EMASA-PM) established the Pedro Moncayo Water Fund (PM Water Fund) in 2019, a public-community model for small to medium municipalities to ensure conservation of water resources and ecosystems through a financial mechanism for protection and restoration actions.

A water fund is defined as a water governance model of collective action and innovation that promotes solutions so that local governments and their inhabitants can provide themselves with water for consumption in quality and quantity through the implementation of conservation, maintenance and recovery measures for water-supplying ecosystems to guarantee their adequate systemic functioning in the long term, and ensure water production for present and future generations.

Report Overview

The overarching goal of this report is to present results from a 2025 ex-post evaluation and answer the primary research questions of the ex-post evaluation: 1) What is the process, history, and form and function of the Pedro Moncayo Water Fund? 2) How effective and sustainable is the PM Water Fund? and 3) What are challenges and recommendations for the PM Water Fund and the three other funds currently being scaled under the Mujeres Rurales project?

Water funds represent an important tool for CARE's global strategy to address funding gaps for the sustainable management of water resources. Insights and recommendations from this report will also inform CARE's intervention strategies beyond Ecuador and contribute to global learnings and conversations on water funds.


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Methodology

The study used a participatory research methodology that was based on collaborative processes of information gathering with the use of community tools and techniques for primary and secondary information collection, involving various stakeholders in the watershed. Documentary research, and qualitative data collection, including focus groups, semi-structured interviews with key informants, and direct observations were used.

Research Objectives

The key research questions for this ex-post evaluation were:

- Why was the Water Fund selected and how does it work within the project's broader landscape model for inclusive and resilient territories?
- What was the fund's general structure and operating model, and how did the various stakeholders contribute to its operation?
- What was the process of creating and managing the fund?
- What conservation activities are being funded through the water fund, how were they chosen, and what were their impacts?
- What challenges were faced in the startup and implementation of the water fund, and what are recommendations for how the water fund model can be scaled, replicated and adapted to contexts outside of Ecuador?
- What structures, policies, and relationships contribute to the sustainability of the water fund?

Research Methods

Primary Sources

This study was based on primary sources, which were provided by the technical teams of the Decentralized Autonomous Government (GAD) of Pedro Moncayo; the Municipal

Water, Sanitation and Sewerage Company (EMASA); the Climate Change Adaptation Project for Andean populations through the management, conservation and restoration of páramos in Pedro Moncayo (ACCRE); and Andean Women project implemented by CARE from 2016 to 2022. The most critical documents are: i) Baseline of the ACCRE Project (2016); ii) Reports on the Pedro Moncayo Water Fund from the ACCRE Project (2017); iii) Actions from the ACCRE Project; iv) Final report of ACCRE-CARE Project (2019); v) Technical report of the 2019 Conservation and Sustainable Use Area (ACUS) Mojanda ordinance; vi) Technical report of the Pedro Moncayo Water Fund ordinance; vii) ACUS Mojanda ordinance; and viii) Water Fund ordinance.

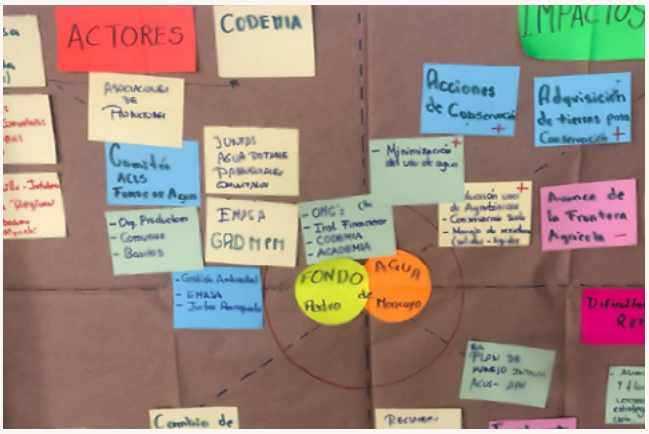
Secondary Sources

Secondary sources for this study included articles, theses or technical documents, which contain data or perspectives from water funds implemented in Ecuador and Latin America, especially those led by the Latin American Alliance of Water Funds. The experience of the Water Fund for Quito (FONAG) was also reviewed, as an exemplary regional initiative, which has promoted the implementation of other funds such as FONAPA, FORAGUA and the Páramos Fund for the Fight against Poverty in Tungurahua.

Focus Groups

Focus groups were the primary form of data collection for this study, chosen because this research method provides us with the perspectives of all participants in a comprehensive manner, with a focus on validation and feedback of opinions. Two focus groups were conducted:

- **Focus Group with technicians.** Composed of technicians from the following directorates: i) Environmental Management: ii) Economic Development and Tourism: iii) Territorial Planning and iv) The water utility (EMASA-PM), with the participation of 7 people between technicians and directors of the mentioned areas.
- **Community Focus Group.** Composed of men and women, mostly producers from Pedro Moncayo who were part of the process of creating and implementing the Water Fund. For this dialogue space, Visualization in Participatory Programs (VIPP)[1] techniques were used to establish a safe, horizontal and participatory space and to ensure that the information gathered was reliable and specific. Eleven people participated.



Focus Group responses

Semi-structured interviews

Interviews combined structured questions with the flexibility to explore new lines of inquiry during the conversation. These discussions were intended to allow for a more detailed understanding of the social, economic, political and environmental aspects of the process of shaping the Pedro Moncayo Water Fund. CARE conducted 7 interviews: with 1 GAD-PM director, 1 EMASA-PM director; 4 GAD-PM and EMASA-PM technicians and 1 producer/community member. The interviews were mostly face-to-face in the territories and lasted 1 hour and 40 minutes using a structured interview script.

Direct observation

Validation of the information was obtained through interviews and surveys, which was especially helpful in verifying the conservation process of the Mojanda Water Protection Area, recognized by Ecuador's Ministry of Environment, Water and Ecological Transition in June 2021 with 6097.03 ha set aside for water protection and restoration activities.

1 VIPP is a people-centered methodology that uses visual tools and techniques to enhance participation and collaboration in group events. It emphasizes the active involvement of participants by visualizing ideas, discussions, and processes through interactive methods to foster a more inclusive and engaging environment.

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Context

The desk review provided valuable information on the importance of the páramo, the water-related challenges faced as well as the environmental, sociopolitical, and programmatic context surrounding the Pedro Moncayo Water Fund.

Importance of the páramo in Ecuador

Ecuador has 13,371 km2 of páramo and the Andean neotropical alpine tundra ecosystem that represents 5% of its territory (Beltrán et al 2009). The vegetation of this ecosystem combined with a spongy organic soil forms a water retention system from which several important streams flow, especially in the dry season (Podwojewski and Poulenard 2011; Avellaneda et al 2014).

The páramo has undergone rapid transformation and degradation due to agriculture, cattle ranching and, in some cases, mining activities (Romo and Calero 2022). Consequently, water flows have decreased and some communities report significant periods of drought (Calvo and Villaverde 2011). Most of the páramo is under communal tenure due to colonization, marginalization, migration and the growth of the mestizaje[2] population, which affects the dynamics of land-use change according to community priorities (Hofstede et al 2014; Avellaneda-Torres et al 2015). Global climate change is also driving up temperatures and making rainfall variable – contributing to degradation and loss of the páramo and negatively affecting livelihoods.

The páramo is important for the ecosystem services it provides, particularly water supply for drinking and agricultural use (Buytaert et al 2006; Mena and Hofstede 2006). The loss of the páramo means a reduction in water supply to adjacent fields and cities located downstream in the watershed, leading to the search for water from increasingly distant sources (De la Cruz et al 2009). At the beginning of the 21st century, about 64% of the total páramo area above 3000 m had been altered by human activities (Hofstede, Coppus, et al 2002). The Mojanda-Cajas Lake System is a vital water source for Pedro Moncayo and neighboring municipalities, and the loss of its páramo from overgrazing, extensive cultivation, and climate change has increased soil erosion and habitat loss, threatening the water quality and quantity in the Lake System.

2 Mestizaje refers to the history of racial and cultural mixture in Latin America.

Social Challenges

In the Andean region of Ecuador, especially in the northern part of the Andes, water is not a naturally scarce resource. In addition to climate change, the mismanagement of water resources under colonial regimes has contributed to long-lasting water scarcity. In the northern biocorridor, which includes the municipalities of Pedro Moncayo and Cayambe, this has been historically evident. Under the hacienda regime[3], the main canals and water systems were for the exclusive use of the haciendas, including water for human consumption (Manosalvas, 2010; Backer, Tutillo, 2009), which produced shortages in the rest of the biocorridor. It was thanks to the organization and struggle for land and water that the communities and the administration of the local municipal GADs achieved not only access, but also how the public sector and communities have historically managed water resources.

Water Challenges

One of the most evident problems is the availability of water in the páramo, which is being affected not only in quality but also in quantity. This is a worrying factor for all stakeholders in the of Pedro Moncayo, as it contradicts the main characteristic of the ecosystem, as the "water factory" for Andean society. The water carrying capacity of lakes such as Chiri Yaku, nestled within the páramo and located in the Mojanda lake system, have been reduced by at least 7 meters, mainly attributed to the overuse of the surrounding watershed, and numerous ecological threats such as less vegetation due to burning or deforestation, erosion problems, increased temperatures and decreased rainfall. Consequently, the páramo loses its capacity to retain water and regulate water cycles.

Another factor that accelerates the water deficit is the introduction of water-intensive, non-native species for timber production, such as pine and eucalyptus. In a study conducted in Cotopaxi, it was found that soils with 20- to 25-year-old pine plantations retained between 39% and 63% less water than páramo soils and that the effect was stronger under drier conditions (Farley, 2011). Other research indicates that eucalyptus plantations tend to have a greater adverse impact than pine and that flow loss is greater when the vegetation is grassland rather than native shrubland (Farley et al. 2005).

3 The hacienda system in Ecuador was a colonial and post-colonial land-holding structure featuring large estates owned by wealthy elites under which Indigenous and mestizo laborers were tied to the land through debt peonage, sharecropping (huasipungo), and servitude.

Programmatic Context

In Ecuador, CARE works to protect and conserve the páramos, improve the adaptive capacity of communities and expand the sustainable use of land and agriculture. These programs include actions to strengthen rural organizations, especially women's organizations, to influence local climate change planning and gender policies. CARE does this by developing capacities of organizations for innovation and circular marketing of their products through clean production strategies, financial education, and community mobilization, including the prevention of violence against women and girls.

Under its water and climate justice program, CARE implements projects with the objectives of supporting water security and community resilience to climate change in Ecuador, as well as financial mechanisms for conservation (water funds), and planting and harvesting safe water to support resilient communities in Ecuador. The Water Fund model was developed and supported under three key projects in the northern and central Andean Sierra: ACCRE (2016-2019), Mujeres Andinas (2021-2024) and Mujeres Rurales (2024-2027). These three projects use a landscape approach based on agroecology, women's economic empowerment, protection and/restoration of páramos and aquatic ecosystems, and participation/advocacy in public policies.

In April 2016, CARE and the Pedro Moncayo municipality (GAD-PM) launched implementation of the project "Adaptation to Climate Change of Andean populations through management, conservation and restoration of moorlands in Pedro Moncayo" (ACCRE). The project aimed to reduce the vulnerability of communities located in the high Andean páramo of Pedro Moncayo to the impacts of climate change on their livelihoods. A key approach included seeking innovative sustainability processes through the implementation of a financial conservation mechanism.

To this end, ACCRE supported the participatory process for the feasibility, design and creation of the Pedro Moncayo Water Fund (PM Water Fund) and the establishment of the governance and policy framework that supports the fund and the participation of public, private, and community stakeholders. CARE prioritized strengthening the governance processes that prioritized community participation and leadership in collaboration with the local municipality and water utility.

The ACCRE follow-on, Mujeres Andinas (2021 to 2024), continued support to the PM Water Fund, while initiating the participatory feasibility process for three new funds in Cayambe, Cotopaxi and Otavalo. The Mujeres Rurales project (2024-2027) continues to support the new Water Funds in Bolívar and Latacunga.

Water Funds in Latin America

A water fund is defined as a "water governance model of collective action and innovation that promotes solutions so that local governments and their inhabitants can provide themselves with water for consumption in quality and quantity through the implementation of conservation, maintenance and recovery measures for water-supplying ecosystems to guarantee their adequate systemic functioning in the long term, and ensure water production for present and future generations." To this end, a water fund is also based on the design of a financial mechanism that orients and articulates the investment of different private, public and social actors to achieve water sustainability (Latin American Alliance of Water Funds 2020). Financial mechanisms for environmental conservation and water resources management have been conceived as a solution to increase the availability of water resources as mentioned by Creed and Meine van Noordwijk, (2018) which allude to the relationship of people and communities with water resources in their multiple daily activities such as access and use for drinking water, sanitation, irrigation and energy generation, among other uses.

However, the authors point out that the current situation of access to water, biodiversity and the ecosystems that constitute them is becoming much more complex with the effects of climate change. The tropical Andes also have their own pressures and dynamics that make them vulnerable. In this context, the communities established around the mountain range benefit from the water provided by glaciers and wetlands, which are highly vulnerable to climate change.

However, the water problem is much more complex, marked by the historical inequity of access to water in the region, which Urquiza Gómez and Cadenas (2015) describe as a "particularly worrying situation given that in certain localities of Latin America, water availability and inequality is very marked." This has led to constant socioeconomic and environmental conflicts over the control of water, and at present, this dispute continues to deepen due to the accelerated growth in demand due to demographic pressures, urban growth and expanding economic activities (Vuille 2013).

> **"In this context, the need to expand the scale of community-based natural resource management programs, the creation of green jobs, the adoption of governance and innovation mechanisms, and the implementation of alternative financing proposals for better water management, have been materialized through mechanisms such as water funds, considered a laudable proposal in the face of the challenges presented by the Latin American water sector."**
>
> **- UN-Water 2019**

Water funds are financial mechanisms that promote organizations and the articulation of key actors through a water governance scheme of collective action and innovation; these actions are suitable for cities and their citizens to improve water management and security, focusing on the creation of nature-based solutions (Latin American Alliance of Water Funds 2020). Currently, Latin America has about 30 water funds in the countries of Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Peru and the Dominican Republic.

Water Funds in Ecuador

Ecuador is home to the first water fund, which was created in 2000 with the establishment of the Environmental Fund for the Protection of Quito's Water (FONAG)[4] in collaboration with The Nature Conservancy (TNC) and the Quito public water utility (Empresa Pública de Servicios de Agua Potable y Saneamiento—EPMAPS). This fund benefits from a privately managed endowment created to protect the natural sources that sustain the city to guarantee the long-term drinking water consumption of Quito's population. It's a model that in subsequent years attracted funding from private companies and international donors. FONAG protects and conserves the watersheds that supply water to 2.5M people living in the city of Quito.

4 For more information see: https://www.fonag.org.ec/web

What is an endowment in a Water Fund?

An endowment (*fideicomiso)* for a water fund is a financial mechanism where donations are held in investment portfolios managed by a private and independent financial institution. The principal remains invested and returns (interest, dividends, etc.) are used to finance activities within the fund's mandate. This approach provides a long-term and reliable funding source. However, they often require capital seed investment and fees paid to financial advisors.

In Ecuador, there are four other water funds: the Paute River Basin Water Fund (FONAPA), the Regional Water Fund and Environmental Fund integrated by several cities in southern Ecuador (FORAGUA), the Water Fund for Guayaquil for the conservation of the Daule River Basin (FONDAGUA), and the Tungurahua Páramo Management and Fight against Poverty Fund**.** The Tungurahua Fund is public-private model that has a mix between an endowment and an annual revolving fund for the communities. The other funds use the endowmment model which means that participating municipalities charge fees to water users, which are first added to the endowment and the interest is then used to finance management and conservation in the municipalities.

It's important to note that these water funds have endowments and are managed at a city (FONAG), provincial level (Tungurahua Fund) or collective of municipalities (FORAGUA) and therefore can generate revenue from a substantial user base which helps attract funding from private companies or international donors. This also points to a gap for water fund models that small to medium municipalities – and highlight the need for models like the PM Water Fund.

There are also public initiatives, with some private contributions. A 2020 CARE study on Payments for Environmental Services identified a mechanism in the Peruvian municipality of El Chaco that consists of determining, in a participatory manner through surveys, an environmental fee within the monthly water bill. Ideally, the monthly payment to be made by users is $0.068 to cover the costs of protecting and restoring 353.84 ha of the micro-watershed supply. However, due to the initial resistance of the citizens, it started with $0.028 and the commitment to make an annual increase of one cent per year gradually for 5 years**.** In addition, the municipality opened an exclusive account to collect the fee and cannot use the money for any other purpose other than payment for environmental services. The agreement between the municipality and landowner families in the San Marcos and Chontaloma micro-watersheds, the main water service providers for El Chaco, is formalized through a cooperation agreement for the payment of environmental services, where the municipality commits to pay $22.50 every three months and together with the landowners must execute projects outlined in the micro-watershed management plans.

Andean Forest and Mojanda Lake System

High Andean forests and ecosystems, such as páramos, are fundamental for water functionality and the provision of drinking and irrigation water for communities and settlements in the middle basin - thus it can be stated that Andean forests are widely known as flow regulating ecosystems with a high water yield (Tobón and Arroyave, 2007; Ataroff and Rada, 2000; Cavelier, 1991; Cavelier and Goldstein, 1989). They especially help to control and maintain water flows during dry periods, which makes them of singular hydrological importance in the tropics (Bruijnzeel, 2006).

The Mojanda Lake System is located in the northern part of Pedro Moncayo**.** According to the Development and Land Management Plan 2021-2023, "… in the Mojanda Lake Zone we can find four lagoons, Caricocha, Guamicocha, Yanacocha and Chiriyacu, which belong to the micro-watershed of the Pisque River. This lake complex is at the top of the mountainous system of the Mojanda and Cajas junction, occupying the crater cauldron of the extinct Mojanda volcano, and has an average altitude of 3,844 meters above sea level.**"**

The Mojanda Conservation and Sustainable Use Area is an important water reserve for the main urban centers in northern Pichincha province, as well as parishes in the municipality of Otavalo. It is estimated that the Mojanda Lake Complex supplies 200,000 people with drinking water or irrigation water for agricultural and livestock activities whose products like roses are exported to international markets. Despite its importance, the lake system has suffered degradation from unsustainable grazing and agricultural practices that have led to deforestation and devegetation of the páramo and reduced the quality and quantity of water provided by the páramo—creating further vulnerabilities of communities to climate change.

Mojanda Conservation and Sustainable Use Area and Mojanda Water Protection Area

To protect the Andean forest, páramo, and Mojanda Lake Complex, the GAD-PM and with support from NGO partners like CARE and ECOLEX (Corporacion de Gestion y Derecho Ambiental) developed and passed an ordinance to declare the Conservation and Sustainable Use Area (ACUS) Mojanda in 2019. The ACUS encompasses the parishes Tabacundo, Tupigachi, Malchinguí, La Esperanza and Tocachi in the municipality of Pedro Moncayo. The ordinance stated that the ACUS would cover an área of of 6,094.38 hectares (PDyOT GAD-PM 2023) and protect over 60 water sources.

Through the ACCRE project, CARE supported the different social and engagement processes to define agreements and limits of the ACUS between 2016 to 2018. As a result, the different stakeholders across five parishes defined the limit of the agricultural frontier, where agriculture activities transition to the ecosystem of the páramo. In addition, compensation agreements and restoration measures were established for the buffer zones degraded by the advance of cattle ranching and extensive agriculture.

The process helped communities and public and private sector partners gain a strong awareness on the benefits of the delimitation of the agricultural frontier, the compensation agreements, and the importance of having the ACUS for the supply and protection of the páramo and water sources.

In 2021, with support from CARE and ECOLEX, the GAD-PM built on the ACUS and successfully advocated with the Ministry of Environment to declare the Mojanda Water Protection Area (Area de Protección Hídrica - APH) and served to expand specific legal protection to the freshwater sources within the ACUS. The APH is a national instrument to safeguard water sources that are critical for human consumption and food security across Ecuador. The APH also demonstrates the importance of municipal ordinances like the ACUS – which serve as a predecessor before attaining national-level protection. Both the ACUS and APH have standalone management committees with planning and budgeting cycles.


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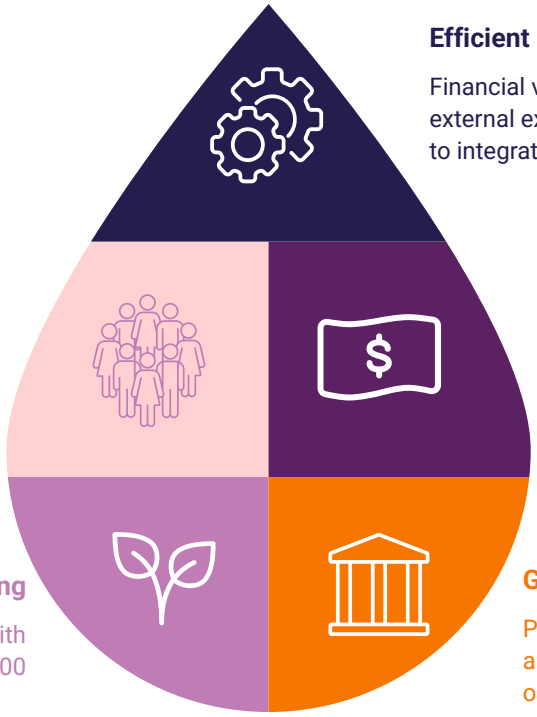
Pedro Moncayo Water Fund

Given the success of water funds in Ecuador and the political will around landscape-level conservation framework, CARE and the GAD-PM began discussions in 2016 that identified the need for a municipal ordinance to protect the Mojanda Lake Complex and the municipality's surround páramo, and the need for a financing mechanism for the conservation of these water-providing ecosystems. A public-community model was selected due to geographic and demographic characteristics – 5 parishes with a population of 30,000, of which 20,000 received drinking water through the EMASA-PM. The EMASA-PM was identified as the main financial contributor and holds a key position within the management structure. The figure below highlights the main components of the PM Water Fund model.

Components of the Water Fund Model



Efficient Resources

Financial viability without external expenses and an option to integrate a trust

Technical Team

Personnel from the Pedro Moncayo GAD supporting the implementation fo the model

Financial Contributions

Direct yearly financial contribution from EMASA-PM's revenue

Environmental Planning

For small municipalities with populations <60,000

Governance Model

Public-community governance approach for the management of water

The following table summarize the key actors linked to the PM Water Fund.

Key Actors	
Local government: Gobierno Autónomo Descentralizado de Pedro Moncayo (GAD-PM) / Pedro Moncayo Decentralized Autonomous Government. This is the municipal government and includes the mayor and municipal technical teams.	**Public Water Utility:** Empresa Municipal de Agua, Saneamiento y Alcantarillado de Pedro Moncayo (EMASA-PM) Municipal Public Water, Sanitation, and Sewerage Utility. The EMASA-PM provides water and sewage services to urban centers of Pedro Moncayo municipality.
Local government technical unit: Dirección de Gestión Ambiental del Gobierno Autónomo Descentralizado de Pedro Moncayo (DGA-PM) / Environmental Unit of the Pedro Moncayo Decentralized Autonomous Government. This is the municipality's technical team responsible for the conservation and protection of the environment.	**Community-based service provision:** Juntas Administradoras de Agua Potable (JAAP) / Drinking Water Management Boards. JAAPs are non-profit organizations responsible for management and operation of community water and sanitation systems. Some form part of the EMASA-PMs management structure but most are independent.
Pedro Moncayo Water Fund Management Committee: The Water Fund Management Committee (WFMC) ensures the PM Water Fund's operations and long-term success, including operational and financial management, strategic planning, monitoring and evaluation, and coordination and outreach with citizens and other municipal stakeholders.	**ACUS and APH Mojanda management committees:** The declaration of the Mojanda Conservation and Sustainable Use Area (declaración del Área de Conservación y Uso Sustentable - ACUS) and Mojanda Water Protection Area (declaratoria del Área de Protección Hídrica Mojanda - APH) established a committee for each which manages the governance and administration of these protected areas to support biodiversity and sustainable resource management.

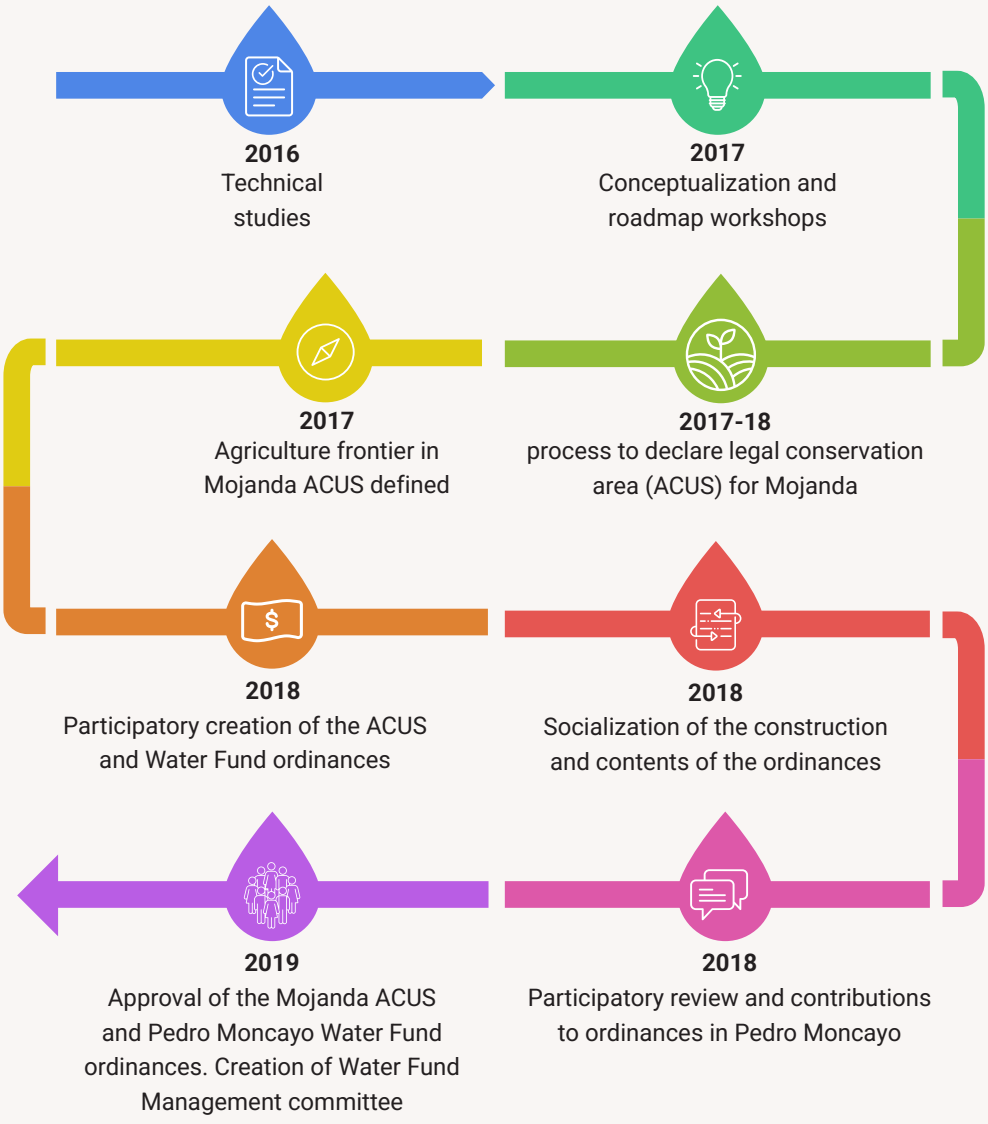
Results

Creating the Pedro Moncayo Water Fund

The focus group with GAD-PM environmental technicians described the creation of the PM Water Fund as a participatory landscape-level process that focused on having an innovative and replicable model for a small or medium-sized municipality, taking into account two key considerations: i) the number of inhabitants of the municipality; and ii) the stakeholders in the territory.

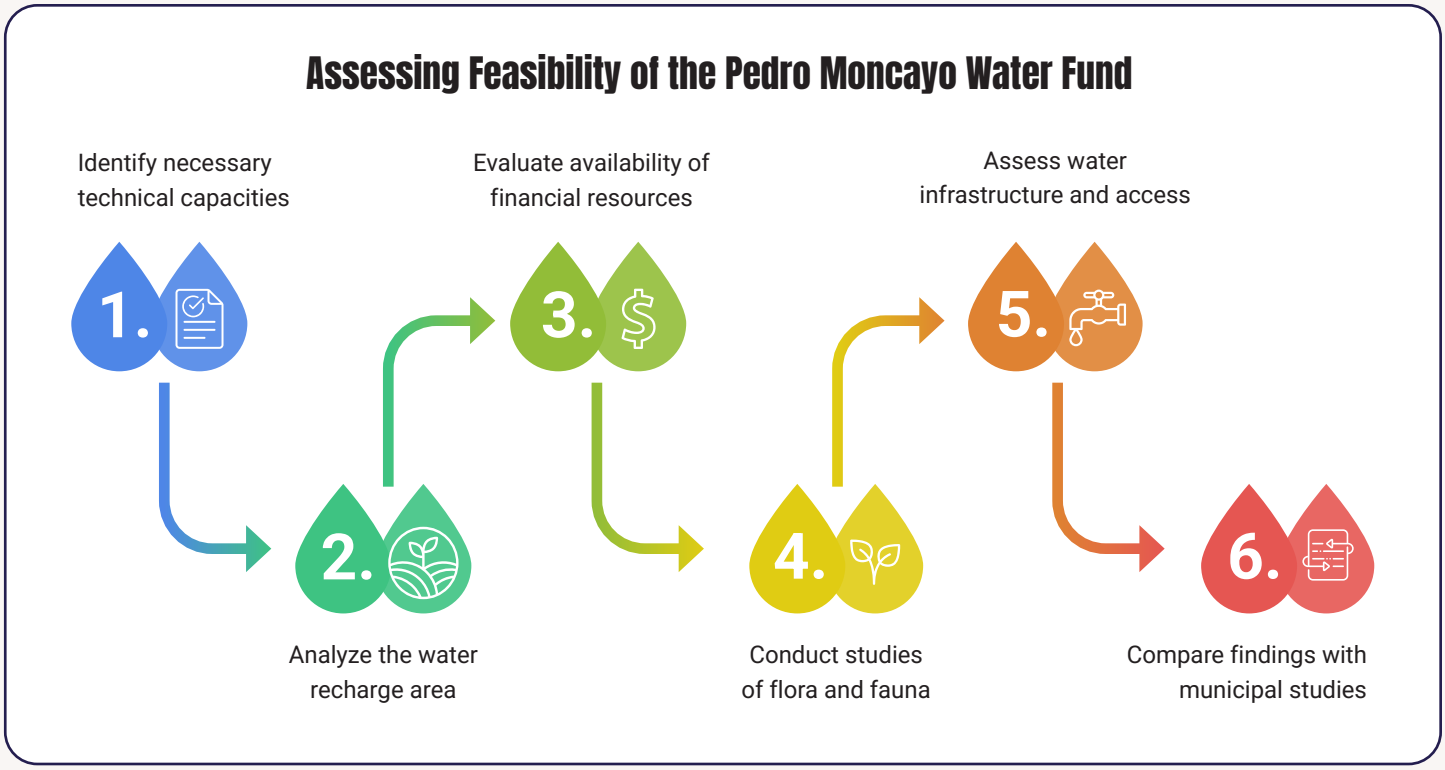
The GAD-PM established the PM Water Fund in 2019 after an almost 3-year process with technical and financial support from CARE through the ACCRE project. The figure below outlines the timeline for each of the steps underlying the creation of the Water Fund which are divided into an Initital Stage (2016-2018 in the blue, teal, green, and yellow), Intermediate Stage (2018 in orange, red and pink) and Consolidation Stage (2019 in purple).

Establishment of the Pedro Moncayo Water Fund



According to focus group discussions and information from the literature review, the *Initial Stage* of the PM Water Fund lasted from 2016 to 2017 (blue and green steps in the figure above) and focused on agreements between the GAD-PM and CARE and the design of the model.

The Initial Stage included *Feasibility and Design Phases* (2016-2017). The *Feasibility Phase* (2016) was comprised of technical studies that specifically looked at the analysis of the water recharge zone, availability of water resources, studies of flora and fauna, basic structure of access to water, and diagnostics to be compared with the studies of the municipality and to establish a history of water availability and quality. The figure below outlines the six-step process of this feasibility phase.



Compilation of this information allowed the Environmental Management Unit of the Pedro Moncayo GAD (GADM-PM) to justify and recommend the use of a water fund to the mayor. With the approval and political buy-in of the mayor, the GAD-PM and CARE kick started the *Design Phase* (2017), which included facilitated participatory discussions and workshops to define the PM Water Fund's mandate, design its governance and management structure, develop a roadmap for its technical proposal for the mayor and municipal council, and begin drafting the municipal ordinance that would legally establish the fund.

At the same time, the GADM-PM requested a loan from the Development Bank of Ecuador to expand Pedro Moncayo's sewerage network, benefiting 20,000 people; this enabled EMASA-PM to reform the distribution of the water charges, without raising the tariff, so that 5% of the amount collected from drinking water consumption fees would be allocated to the PM Water Fund and making the EMASA-PM the exclusive financial contributor to the PM Water Fund (Córdova A. & Viteri M. 2020).

Through a process of negotiation and consensus-building, the GAD-PM, EMASA-PM, and CARE reached agreement on a public-community model and governance structure for the relatively small size of population and the municipality. While the Feasability and Design phases were being carried out, the GAD-PM, with support from partners like CARE, began the participatory process to declare a legally protected conservation area for the Mojanda Lake Complex in 2017.

According to engineer Amanda Cuzco, Director of the Environmental Unit of the GAD-PM,

> "The water fund was a process that was developed in the territories, with schedules according to the availability of the community. This is why it was created with the public and community representatives, which will allow us to manage independently and without trust representation expenses[5] [the way most water conservation financial mechanisms are currently managed]. The funds were collected under the conservation financial mechanism with a participatory governance structure, where there is representation of the majority of stakeholders in the territory".

The Intermediate Stage lasted about 1 year (2018-19) that comprised the process of creating, reviewing, socializing and approving both the ordinance for the PM Water Fund and the declaration of the Mojanda ACUS. The content of the municipal ordinance for the PM Water Fund was finalized in 2018 following a participatory process between the GADM-PM, EMASA-PM, CARE, FONAG, SENAGUA and local organizations such as TURUJTA, Agroecological Producers Associations, Unión de Organizaciones Campesinas e Indígenas Cochasquí - Pedro Moncayo (UCCOPEM), and other actors in the municipality**.** The municipal ordinance included the legal and institutional frameworks for the Fund, its structure, and decision-making mechanisms. The proposal was then presented to the Legal Commission of EMASA-PM who approved it to be presented to the Municipal Council. The Municipal Council passed the ordinance in 2019 and established the PM Water Fund as a legal entity.

This stage concluded with the arrival of a new administration following the mayoral elections in 2018. The new mayoral elections marked the departure of a previous mayor and administration that prioritized and promoted the conservation of the Mojanda Lake Complex and páramo as well as the PM Water Fund as a critical financial mechanism to accomplish these goals.

The *Consolidation Stage* (2019 – present) focused on establishing the PM Water Fund Management Committee (WFMC) and defining the different stakeholder roles, responsibilities, and operational and planning procedures for the PM Water Fund. According to the focus group carried out with GAD-PM technicians, this stage experienced serious challenges at the institutional level.

The mayoral elections and subsequent government turnover in 2019 significantly impacted the GAD-PM's agenda and priorities. Much of the political will and many of the actions that were carried out with the previous mayoral administration (2015-2019) were not followed up, decided upon or invested in by the new mayoral administration (2019-2023). This resulted in the de-prioritization of the PM Water Fund. However, EMASA-PM still provided its yearly financial contribution, but the PM Water Fund was dormant and not able to move to an operational stage to carry out conservation and restoration activities. It's important to note that this is a regular dynamic in Ecuadorian politics – often new mayoral administrations do not take up the political and development agendas and priorities of previous administrations.

According to Carmelina Morán, CARE technician of the Mujeres Andinas project, support for the ordinance and establishment of a draft regulation was prioritized by the GAD-PMs Environmental Unit and the EMASA-PM, but the mayoral leadership did not offer the support necessary for the fund to start operating.

It should be noted that despite the dormant status of the PM Water Fund, the GAD-PMs Environmental Unit continued to carry out conservation actions with technical and financial support from CARE and the Mujeres Andinas project. The GAD-PM expressed a commitment that once operational, the PM Water Fund would follow up on conservation actions in the following years. It is very important to mention that, despite the limited roles of the PM Water Fund, women supported by the Mujeres Andinas project were at the forefront of leading and carrying out water source conservation, agricultural border delimitation, combating the burning of grasslands and increasing agroecological production continued in the territories.

This Consolidation Stage also included the declaration of two legally protected conservation areas established by the Pedro Moncayo municipality and national government of Ecuador with support from CARE: 1) The Mojanda ACUS declared in 2019 that protects the Mojanda Lake Complex, a series of freshwater lagoons and páramos that covers 6,000 hectares and supplies water to 200,000 people in the Pedro Moncayo municipality; 2) The Mojanda Water Protection Area (Área de Protección Hídrica Mojanda - APH) declared in 2021 and is a national-level declaration that specifically protects the freshwater ecosystems within the ACUS and strengthensits legal protections.

5 Trusts are used to protect and manage assets, estate planning, establish trusts for specific beneficiaries, facilitate investment and wealth management, among other things.

These two conservation mechanisms were constructed and approved in parallel with the PM Water Fund highlighting the importance of having a permanent financial mechanism for water conservation within the context of larger landscape-level planning and conservation.

This is emphasized by Mauricio Ochoa, Manager of EMASA-PM:

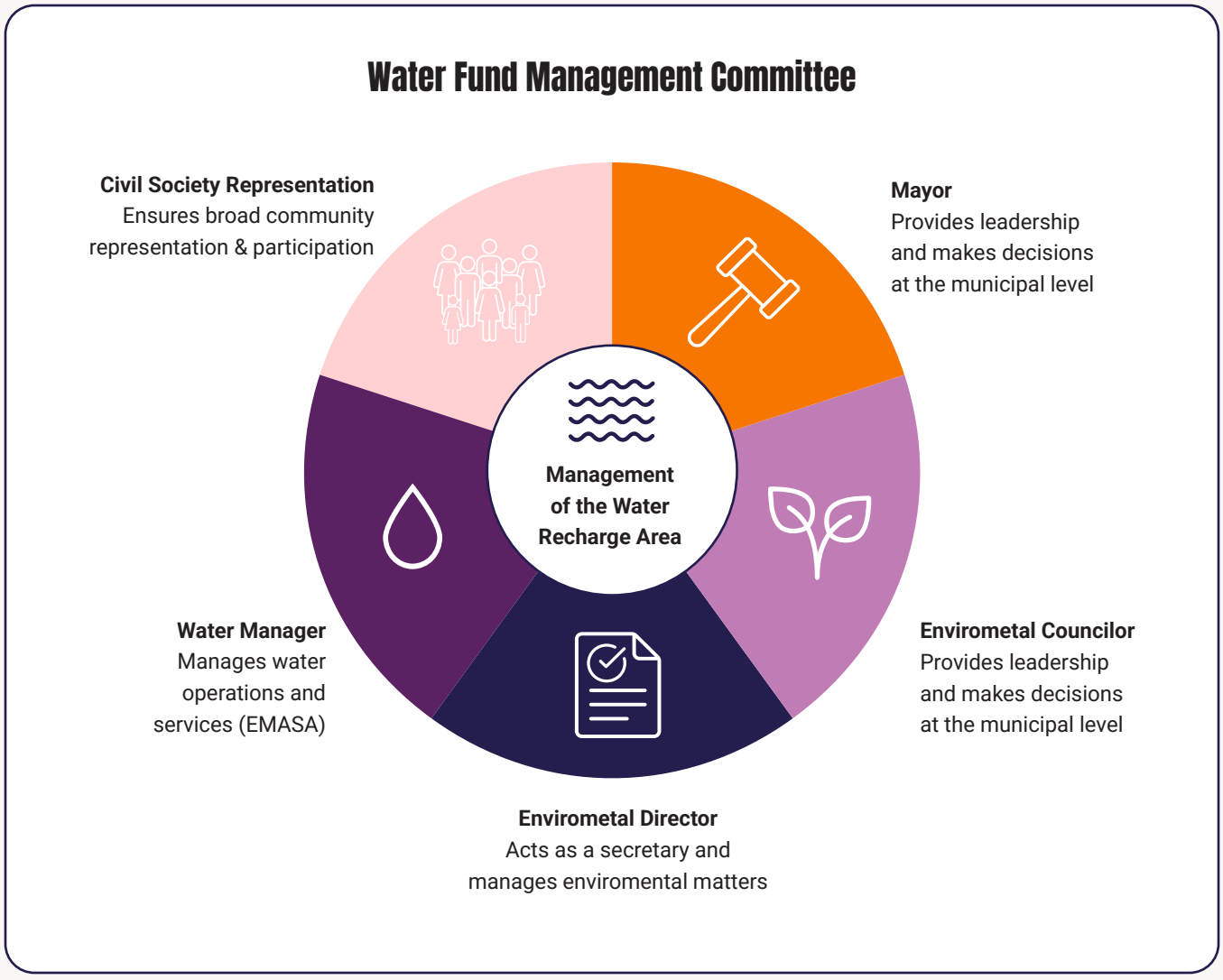
> "There were 3 moments to ensure the objective of water conservation in Pedro Moncayo: the first is the creation of the ACUS with a participatory and socialized process, the second is the creation of the Water Protection Area (APH) - these two instances must have their planning or management plan, and the third is the ordinance and creation of the Water Fund."

And, Catalina Jiménez, Technician of Productive Development of the GAD sustains:

> "The operation of the Water Fund complements the territorial model that CARE has been working on all these years and will surely improve the sustainability of productive processes".

Water Fund Management Committee Members

This section describes the structure and membership of the Water Fund Management Committee, mandated by the initial ordinance to oversee the implementation of the Fund. The figure below outlines each of the members and their roles within the Committee.



- Decisions are made by a simple majority of its members. The secretary can voice an opinion but does not have a vote.
- The members of this committee participate on a voluntary basis.
- Among the members assigned to the Committee, a chairperson will be nominated to preside over the meetings and a secretary will be nominated to keep the records.
- The WFMC meets quarterly to monitor progress and conduct annual planning and budgeting cycles to produce an Annual Operating Plan, which will be coordinated and prepared by the GAD-PM Environmental Director (i.e. WFMC Secretary).
- This annual plan must be approved by all of the Committee during an assembly meeting and validated through signatures of each member. The plan is based on the available budget, which is comprised of the EMASA-PMs contributions and any other revenue source.

Despite having a mandate outlined in the municipal ordinance, according to the focus groups, the Water Fund Management Committee has not met or facilitated planning meetings since 2019. Participants report this has been a decision of the previous administration (2019-2023), and also point to the recurring challenges of maintaining the momentum and political will to convene the WFMC amid shifting priorities due to government turnover and transition. This is stated by Catalina Jimenez, GAD-PM Productive Development Technician who mentions:

> "...there has been no socialization of the benefits of páramos conservation and what the Pedro Moncayo Water Fund is for, which would help to improve the participation and involvement of all stakeholders in the territory."

Focus group participants also flagged the importance of integrating additional actors into the Water Fund Management Committee to strengthen local ownership and effectiveness of the PM Water Fund. Some actors can also provide financial contributions to the fund and help diversify its revenue sources. Participants flagged the JAAP (Drinking Water Management Boards) and two actors from the irrigation sector – CODEMIA (Development Consortium of Integrated Management of Water and Environment - Cayambe Pedro Moncayo) and the Regional Irrigation Boards – as important stakeholders that should be integrated into the WFMC. Given their social and political capital within their communities, and their major roles in the provision of water services for drinking and agriculture, these Drinking Water Management Boards and Irrigation Committees, and producer groups are vital actors to ensure the protection and restoration of the páramo and freshwater resources in the Mojanda ACUS and APH.

Who are CODEMIA and the Irrigation Committees?

CODEMIA is a consortium of local community organizations and producer groups that manage the Tabacundo irrigation canal (which connectes Pedro Moncayo with a neighboring municipality of Cayambe) to ensure equal distribution of water and that floriculture and other agricultural businesses sustainably use water resources and contribute to the upkeep and maintance of the canal.

Irrigation Committees act as irrigatioin water user groups and determine water allocation for productive use and manage and maintain irrigation infrastructure.

Mauricio Ochoa Manager of EMASA-PM mentions that:

> "An interesting model of broader governance would be with the CODEMIA link, and the 4 JAAP (Drinking Water Management Boards) of Malchingui, Tocachi, Tupigachi and La Esperanza, which would be part of the management committee and could also be [financial] contributors."

The relationship between the WFMC and the Mojanda ACUS and APH is direct, especially in its planning processes, management plans and strategic vision, as well as its objectives, which should seek: conservation, restoration, compensation and monitoring/reporting the status of the water recharge area and its nearby water sources.

Legal, Technical and Financial Structure of the Water Fund

This section outlines the legal framework for the Pedro Moncayo Water Fund, the technical mandate and planning-implementation process, and the financial structure of the fund.

Source: Project ACCRE-CARE

The municipal ordinance passed in May 2019 acted as the legal mechanism for the PM Water Fund and was a critical step as it established the fund as a legal entity within the Pedro Moncayo municipality and the Mojanda ACUS/APH. The municipal ordinance officially denoted the governance and management structure of the fund, notably the mandate of the fund (i.e. conserve and restore the páramo and Mojanda ACUS/APH area) and the establishment of the Water Fund Management Committee (WFMC), its membership and the role and responsibilities of each actor. However, according to focus groups, 80% of participants did not fully know the content of the municipal ordinance. Additionally, although 90% of participants reported knowing that there is a financial mechanism for the conservation and management of the páramo and water sources, they do not know how to access the funds.

The PM Water Fund's technical mandate is to carry out protection and restoration activities in the Pedro Moncayo municipality as well as the páramo and freshwater lagoons of the Mojanda ACUS/APH. Due to the inoperative status of the WFMC, this technical mandate is currently managed and carried out by the Environmental Unit of the GAD-PM with support from EMASA-PM.

As for the financial structure, the EMASA-PM is the only financial contributor to the PM Water Fund. According to the ordinance, the EMASA-PM must have an "account with an initial fund of 5% of total annual consumption of which will be transferred to the special account of the environmental services program". According to the ordinance and legal agreements, the 5% contribution is equivalent to around $50,000 dollars per year, which must be transferred to an autonomous account as mentioned in the ordinance. Although the EMASA-PM has fulfilled its commitment to contribute 5% of annual revenues to the fund and the funds have remained ring-fenced, the PM Water Fund has yet to directly finance restoration and conservation activities since the approval of the municipal ordinance in 2019.

This is the result of several obstacles and challenges that result in non-compliance with the requirements outlined in the municipal ordinance. At the fund level, the Management Committee does not meet, does not plan or budget, and there is no separate bank account for the fund. At the governance and political level, there is a lack of consensus between the GAD-PM and EMASA-PM regarding transparency and roles and responsibilities in the management and use of funds.

According to EMASA-PM's Manager, the main reason for not disbursing the annual amount by the public water facility is the lack of clarity on the part of the Municipal Government for the investment processes and actions to be carried out by the Water Fund.

During the conception of the Water Fund and the development of the ordinance, there was also an agreement to include fees paid by a nearby floriculture company, which are the main water extractors in the municipality. However, the WFMC did not move forward to formalize and document this contribution due to stalled decision making and limited political will. The floriculture company, however, remains interested in contributing to the PM Water Fund in both its finances and management.

Participants in the interviews and focus groups stressed the urgency of passing a new regulation to re-activate the PM Water Fund and its Management Committee. The regulation would legally reinforce the municipal ordinance regarding the roles and responsibilities of the WFMC, GAD-PM and EMASA-PM when it comes to the management, use and allocation of funds. This regulation would also be an opportunity for the GAD-PM and EMASA-PM to expand the membership of the WFMC to include the JAAP, CODEMIA, Irrigation Committees and women's producer groups.

In the focus groups, several actors that could be part of the formulation of this regulation were mentioned:

- Academia: Universidad Central, Universidad Salesiana and Universidad Técnica del Norte;
- NGOs: CARE, ECOLEX, Aves y Conservación, SEDAL, and ECOPAR;
- SLOs: CODEMIA and JAAP (Drinking Water Management Boards);
- Private Enterprise: Floricultural plantations and financial institutions.

According to Johana Morales, Environmental Unit technician of the GAD-PM:

> "I also belong to a Community Water Board of San José Chico and EMASA-PM always mentioned to the Water Board that there is a water fund that is collecting funds, with which conservation actions can be carried out for the water recharge zone of Mojanda."

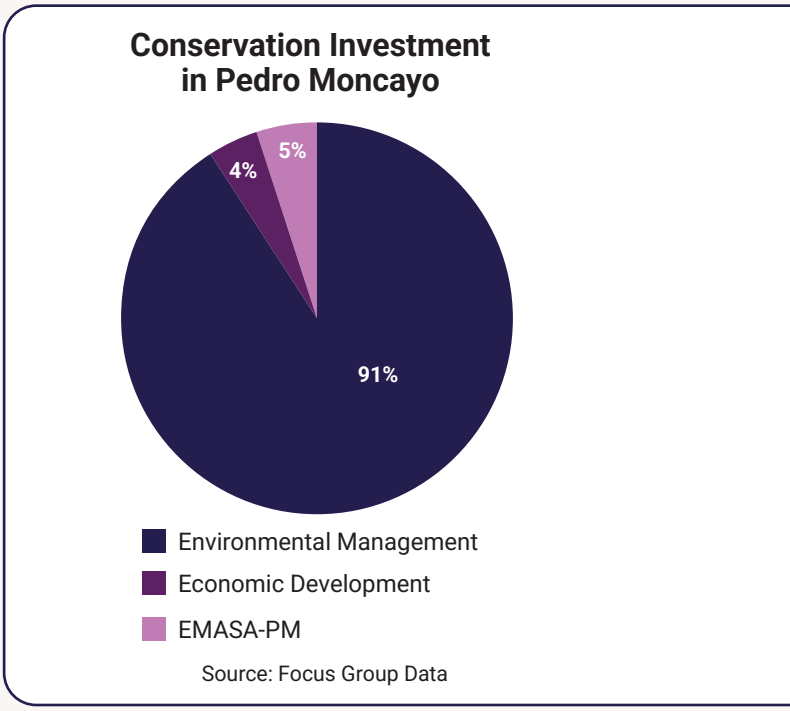
María Andrang, a member of the Association of Agroecological Women Producers of Buen Vivir, echoed sentiments of other participants in interviews and focus groups that there needs to be a regulation that clarifies the use, justification and accountability of financial resources in the Water Fund and there should be more participation from women in the process of creating this regulation and managing the Fund:

> "Women should be part of these actions of the water fund and its budget, which should support women agro-ecological producers who are a fundamental part of conservation and clean production processes. With CARE, we had been participating in the formulation of the water fund and some conservation actions."

This addresses the crucial role women play in the conservation of water resources, such as women-led networks that monitor and defend water sources, mobilize local assemblies, and implement local stewardship actions.[6] Indigenous women are often the custodians of place-based knowledge about springs, sacred water sites, seasonal indicators, and ancestral management practices. At the household level, women's role in collecting, storing and using water gives them practical leverage in local water quality initiatives (e.g., safe storage, sanitation linkages, small-scale water point maintenance).

Despite these challenges, the Environmental Unit of the GAD-PM has ensured continuity of the technical mandate and financed restoration activities and conservation using other municipal budget lines. According to information gathered from the focus group of technicians, the GAD-PM allocates an average of $110,000 per year, which is separate from the Water Fund, to conservation issues such as páramo ranger salaries. The EMASA-PM has also been funding communications campaigns on the importance of watershed management.

The figure below breaks down the budget lines used to finance conservation and restoration activities.



Aside from ranger salaries, the Environmental Unit has also carried out reforestation and protection actions have been carried out for the Chiri Yaku water recharge area, including native plants, tools and material to fence the area, with the support of community mingas, traditional communal work.

6 Rosero, S. (2023, June 23). *An army of 800 women protects Ecuador's water*. EL PAÍS English. https://english.elpais.com/international/2023-06-23/an-army-of-800-women-protects-ecuors-water.html

If the WFMC was operational, some illustrative expenses in the budget would be: i) park ranger salaries; ii) purchase of supplies and equipment for territorial monitoring (radios and motorcycles for patrols); iii) purchase of supplies and plants for restoration processes; iv) development of thematic maps for the ACUS; and v) communications and public outreach.

What is the status of the Water Fund's operation and proposed activities?

Despite its challenges, focus group participants expressed a hope and expectation that the PM Water Fund will begin to finance conservation and monitoring actions of the páramos once the proper management and governance structures are in place. All participants involved in interviews and focus groups reported the immense value of having a Water Fund with a budget already established. Mr. Mauricio Ochoa, the manager of EMASA-PM, emphasized the importance of the Water Fund despite its challenges:

> "Having the Water Fund already established is a great achievement for the [municipality] and will allow us to have safe water for the entire population, in addition to the protection of the páramos and wetlands. We, as a company, are willing to be part of how the Fund should work and if possible lead this process."

Participants also emphasized that the model of the Pedro Moncayo Water Fund is directly linked with the ACUS and APH, and can financially contribute to, expand, and sustain the impact of the conservation actions already in place through these mechanisms. Amanda Cuzco, Director of Environmental Management of the GAD PM, affirmed that,

> "The ACUS Mojanda management committee is currently functioning, which has a structure similar to that of the Water Fund, and can contribute to many of the actions that can be determined and implemented under the Water Fund, highlighting a need to establish a single governance process that links the ACUS-APH and the conservation, monitoring and reporting actions that the Water Fund can implement.

The figure below summarizes the benefits and synergies of the PM Water Fund.

Sustainability and Replicability

The PM Water Fund's sustainability remains a constant challenge due to downstream effects of mayoral elections and subsequent government turnover, institutional bottlenecks that delay decision-making and progress, and a concentrated revenue source. In addition, low awareness of the PM Water Fund and its objectives among citizens and other local and traditional authorities prevent these groups from holding the WFMC accountable.

The lack of diversified revenue resources is a major factor that will affect the long-term sustainability of the fund. As mentioned by the manager of EMASA-PM, maintaining the actions of the Water Fund only with the contribution of EMASA-PM is difficult, and not strategic. The willingness from private sector actors such as local floriculture companies to financially contribute has not yet been leveraged.

Poor communication and transparency of the Water Fund's operations and activities also hamper its sustainability, as noted by María Andrango, Agroecological Producer of the Association of Good Living:

> "...there are actions that the GAD of Pedro Moncayo carries out to protect the páramos and lagoons, but it is not shared whether these are financed by the Water Fund or by another type of budget."

However, there is momentum to increase the efficacy and sustainability of the Water Fund. The current administration of the GAD-PM, whose 4-year term ends in 2027, is now committed to implement the PM Water Fund with the conservation actions of ACUS Mojanda and has agreed with the EMASA-PM to establish a roadmap for raising private funds with some actors of the territory that benefit from the water resources.

Amanda Cusco, Director of the GAD-PMs Environmental Unit, mentions the implementation of a process of sensitization and communication about the importance of having a territory with an ACUS supported by the Water Fund. She affirms that this type of action will help to improve the understanding of the Water Fund and its application, as well as create further stakeholder interest in being part of the conservation.

The focus groups and the people interviewed agree that the PM Water Fund's model is highly replicable and suitable for other small or medium-sized municipalities, but taking into consideration the following strategic aspects that underscore its potential to be replicated in other contexts:

1. The Water Fund must be linked to a specific water recharge area like the páramo, which supports its ecosystemic functionality.
2. The Water Fund should be linked to an upstream conservation area like the ACUS-Mojanda whenever possible.
3. A public water utility should support the collection of resources and financing of the Water Fund.
4. Authorities and technicians of the relevant GAD should be trained and sensitized on water conservation and functionality.
5. The promotion of agroecological or sustainable production processes and their associated actors should be linked to the creation and implementation of the Water Fund.

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Recommendations

Focus Group and Interview Recommendations

To speak of the Pedro Moncayo Water Fund is to speak of a process full of challenges, which require recommendations to make the GAD and EMASA more involved with and responsive to the processes, actions and needs of the territories in terms of conservation, monitoring and reporting.

The table below gives a summary of the recommendations offered by participants in the focus groups and interviews.

Focus Groups	Interviews
Compensate community members for productive issues to ensure conservation.	Involve new contributors such as agricultural and floricultural companies and financial institutions in the territory.
Establish a land purchase program for conservation.	Continue the implementation of the ACUS-APH Management Plan as a basis for supporting conservation actions financing by the Water Fund.
Promote communication strategies that raise awareness and educate the population.	Raise awareness among young people and children, using playful tools to teach them about the Water Fund.
Raise more funds to supplement investment capital.	Generate governance spaces that involve large social organizations that talk about water, such as CODEMIA and Drinking Water Management Boards (JAAP).
Ensure that information about the Water Fund information reaches the territories.	Have a regulation for the ordinance that will allow the immediate implementation of actions under the Water Fund.
Promote legal locks[1] that no authority can violate or fail to enforce.	Have a consolidated communication strategy that educates communities on the relationship and co-benefits between the ACUS-APH declarations and the Water Fund.
Establish participatory regulations to ensure the efficiency and transparency of the Water Fund.	Establish a fundraising strategy for the next 10 years of operation of the Water Fund.

The subsequent sections outline recommendations both generally and to specific stakeholders based off primary and secondary data sources.

1 Legal lock is a legal measure, in which no change or movement to the document and/or process will be admitted until further notice or review

Key Takeaways for CARE and PM Water Fund Partners

Overall, the report offers many lessons learned and tangible next steps for how the successes of the PM Water Fund can be expanded while alleviating the bottlenecks that have stymied its potential for conservation, restoration and water resources management.

Recommendations for PM Water Fund Stakeholders and Partners

The sections below group the key takeaways for CARE and the PM Water Fund partners, particularly EMASA-PM and the GAD-PM.

Legal and Regulatory

The GAD-PM and EMASA-PM must ensure compliance with the original ordinance by working with a legal consultant to draft and pass a regulation that:

- Defines the mandate and operation of the Water Fund Management Committee
- Formalizes the designation of a technical secretary
- Establishes a single, autonomous account for the management of the fund's financial resources independently from that of the GAD-PM and EMASA-PM.
- Creates a timeline and legal accountability for the use of the funds

CARE can facilitate discussion and consensus-building and provide financial support for the legal consultant. This regulation will re-activate the WFMC and help accomplish the rest of the recommendations below.

Financial and Operational

- **Once operational, the WFMC must develop a revenue generation strategy and diversify the PM Water Fund's revenue sources to ensure financial sustainability.** The WFMC's revenue strategy should track expenses, contributions, and investments and be based on an analysis of financial modeling exercises that provide cost-recovery ratios and metrics that track how spending protects the páramos. The revenue strategy should consider contributions from other water users, such as floriculture companies and local Drinking Water Management Boards (JAAP), and develop basic guidelines for new members and financial sources so that each potential partner or ally is clear about their participation, contribution, and decision-making role. The WFMC, GAD-PM, and EMASA-PM should also consider impact investment mechanisms or an endowment model if they can raise enough seed capital.
- **Once operational, the WFMC should develop plans for the use of current and future funds** accumulated by the PM Water Fund, focusing on a participatory and multi-stakeholder process for outlining the conservation actions to be financed for protecting the páramos. This will need to be done in coordination with the ACUS and APH management committees.

Inclusive Governance and Accountability

- **With the support from the GAD-PM and EMASA-PM, the WFMC should establish clear mechanisms for transparency and oversight** to ensure that the funds collected are used exclusively for conservation activities, avoiding community distrust and ensuring compliance with public policies.
- **GAD-PM, EMASA-PM and WFMC must encourage the participation of women in the governance of the PM Water Fund** through the inclusion of women's producer groups in: the structure and decision-making of the WFMC, the development and implementation of monitoring systems for the impacts of funded conservation activities, and overseeing transparency of the Water Fund's budgeting.
- **Add other important stakeholders to the WFMC to improve governance and decision-making processes**, prioritizing the Drinking Water Management Boards (JAAP), CODEMIA and Irrigation Committees, in addition to women's producer groups. The WFMC must expand its membership to include these groups and assess feasibility of their financial contribution to the PM Water Fund.
- **With support from the GAD-PM, the WFMC should maintain a database for all of the technical files of the PM Water Fund** (e.g. hydrological and environmental studies, community feedback, details of the ordinance and any associated regulations, etc), and ensure these inform the development of the indicators for the progress of the conservation actions that could be financed through the Fund.

Regional Planning and Knowledge Sharing

- **With leadership from the GAD-PM, the WFMC to integrate the PM Water Fund into regional conservation frameworks,** specifically by conducting joint annual planning between the PM Water Fund, Mojanda Conservation Area (ACUS), Water Protection Area (APH); and including these annual plans in the Development and Land Use Plan of the municipal governments and five parish governments.
- **The WFMC to establish an internal and external communication strategy** to help socialize the PM Water Fund and the Mojanda ACUS as a sustainable territorial model for the conservation of water resources and Andean biodiversity.
- **The GAD-PM and CARE to share the PM Water Fund's challenges, benefits, and technical recommendations** with partners in the central highlands of Ecuador to encourage the development of other financial mechanisms for environmental conservation and water recharge. CARE specifically should encourage the adoption of water funds in other contexts by socializing the experience of the PM Water Fund with other country programs and sector partners.

Considerations for the Startup of New Water Funds

While this report's recommendations are specific to CARE programs in Ecuador such as Mujeres Rurales that are planning on scaling and replicating the PM Water Fund model, they are useful for any organization interested in creating a water fund in a small to medium-sized municipality.

- **Consider the context,** specifically population, hydrology and ecology, and the policy and legal environment**.** The replicability of the PM Water Fund model in suited to small and medium-sized municipalities such as the Cayambe municipality, which has similar environmental and demographic characteristics.
- **Conduct a thorough stakeholder analysis** of all potential water users and partners, considering community organizations and producer groups, water utilities, Drinking Water Management Boards (JAAP) and governance bodies, environmental conservation and natural resources management organizations, and government partners from the municipal to regional levels.
- **Prepare an accurate timeline** for the startup of a water fund. Because the governance of a water fund is dynamic and complex, the time needed to achieve maturity and stability in the internal and external components of its formation and decision-making must be considered.
- **Hire a permanent legal advisor**, with experience in the competency processes of municipal governments and in the management of public budgets, to support the government's legal department and the project's technical team.
- **Ensure that processes for the creation and implementation of water funds are done in a participatory manner,** considering the ecology and hydrology in the relevant watershed with government partners and all water user groups and beneficiaries included, particularly women.
- **Build capacities in the areas of water functionality, conservation and inclusive governance** for all public, community and private stakeholders in the territories.
- **Focus on mixed public-community management options,** with clear legal advice to support the development of a local policy document that is supported by technical files, free and informed prior consent (FPIC), and long-term stakeholder engagement.
- **Develop a clear and transparent legal framework**, so that the use of the funds is delimited and exclusive for conservation, restoration, compensation and monitoring actions of the water recharge area and its water sources, according to the regulations established under a regulation.
- **Maintain continuous communication, socialization and awareness processes** in all the territories where the water funds will be implemented. Develop simple and clear communication materials that allow for a better understanding of the process and its long-term impacts.
- **Integrate water funds into National Adaptation Plans and Nationally Determined Contributions.** By linking utilities, municipalities, and communities, water funds operationalize climate commitments through measurable actions that improve water security, reduce disaster risks, and enhance carbon sequestration. Embedding water funds in national climate policy also ensures alignment with equity goals by strengthening the role of women and indigenous groups in watershed governance.
- **Establish financing schemes for conservation that don't require large user bases.** The framework of the PM Water Fund offers smaller and more rural municipalities an opportunity to reduce vulnerability to future water security challenges and ensure enough water availability for all livelihoods. In a national context, smaller funds can complement larger, more urban water funds and help countries develop fit-for-purpose conservation schemes to meet national strategies and policies around conservation, climate change adaptation and water security.

Conclusions

The Pedro Moncayo Water Fund presents a promising and adaptable model for small to medium-sized municipalities that lack the extensive user bases or capital endowments of larger water funds. Instead of relying on large-scale investment returns like other funds, the fund is currently structured around a recurring contribution model financed through 5% of user fees from the EMASA-PM, which services around 20,000 people. Although the PM Water Fund will need to diversify its revenue sources, the 5% EMASA-PM contribution has already generated approximately $300,000 – representing a significant investment towards conservation and restoration of the páramo and offering a viable financing alternative for small to medium municipalities in Ecuador.

The PM Water Fund also shows a new way of conceptualizing Water Funds that is more localized and smaller in scope for the conservation and restoration of smaller water recharge areas. This requires intensive social processes and stakeholder engagement in the beginning but can generate transparency and local ownership.

The creation and legal approval of the PM Water Fund, alongside the ordinances establishing the Mojanda ACUS and APH, mark a significant step in formalizing a conservation-based land management model. Rooted in grassroots efforts, this framework reflects a deepening local and regional understanding of the importance of the páramo on the health of the Mojanda Lake system and the water resources it provides for downstream communities.

Despite its legal foundation and available financial resources, the Water Fund has faced operational challenges since the approval of its ordinance in 2019, primarily due to a lack of political will from a new municipal administration and coordination issues between the GAD-PM and EMASA-PM. These institutional bottlenecks have led to non-compliance with the fund's guiding ordinance. However, renewed prioritization by the current mayoral leadership offers a chance to relaunch the initiative. A proposed regulation to complement the ordinance aims to enhance financial transparency, resolve implementation barriers, and reactivate the Water Fund Management Committee.

A major challenge going forward will be maintaining public trust in the management of Water Fund resources, ensuring that budgets are transparently allocated to conservation activities and not diverted for unrelated purposes. While the GAD-PM's Environmental Management Unit has supported some restoration work in the Mojanda buffer zones, the impact of these actions could be significantly amplified by utilizing the financial reserves accumulated by the fund over the past five years.

The PM Water Fund also holds untapped potential for greater stakeholder participation through its WFMC. Local Drinking Water Management Boards (JAAP) and a coalition of producer groups and community organizations (CODEMIA) have expressed strong interest in contributing to and helping govern the fund.

There is also growing enthusiasm among private actors—including floriculture companies, financial institutions, and Drinking Water Management Boards and Irrigation Committees—to join the initiative. However, care must be taken to ensure that private sector involvement does not compromise the fund's environmental goals or lead to undue influence over tax and permit processes.

Improving public awareness and education is another key opportunity. A strategic communication and community engagement campaign could foster broader understanding of the PM Water Fund, the ACUS and APH designations, and the overarching goals of ecosystem protection and water resource sustainability. Such outreach is essential to build community ownership and support.

Lastly, there is a notable gender gap in water governance in Pedro Moncayo. Women are often the most active in water source conservation efforts, yet they remain underrepresented in decision-making spaces. Programs like ACCRE, Mujeres Andinas, and Mujeres Rurales are empowering women-led agroecological associations, which are crucial allies in restoration and agroforestry efforts. The WFMC presents a critical opportunity to give these groups formal representation and influence in shaping conservation strategies and fund governance.

While the PM Water Fund has faced challenges in its implementation, the establishment of a mechanism devoted exclusively to the conservation of the páramos represents a 'watershed' moment for Pedro Moncayo's commitments to integrated conservation, restoration and water resources management that CARE is already building on in the creation of new water funds in Ecuador. The Pedro Moncayo Water Fund's setbacks and successes provide critical guidance for how to sustain the ecosystems necessary for the gift of safe and reliable water for all.

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