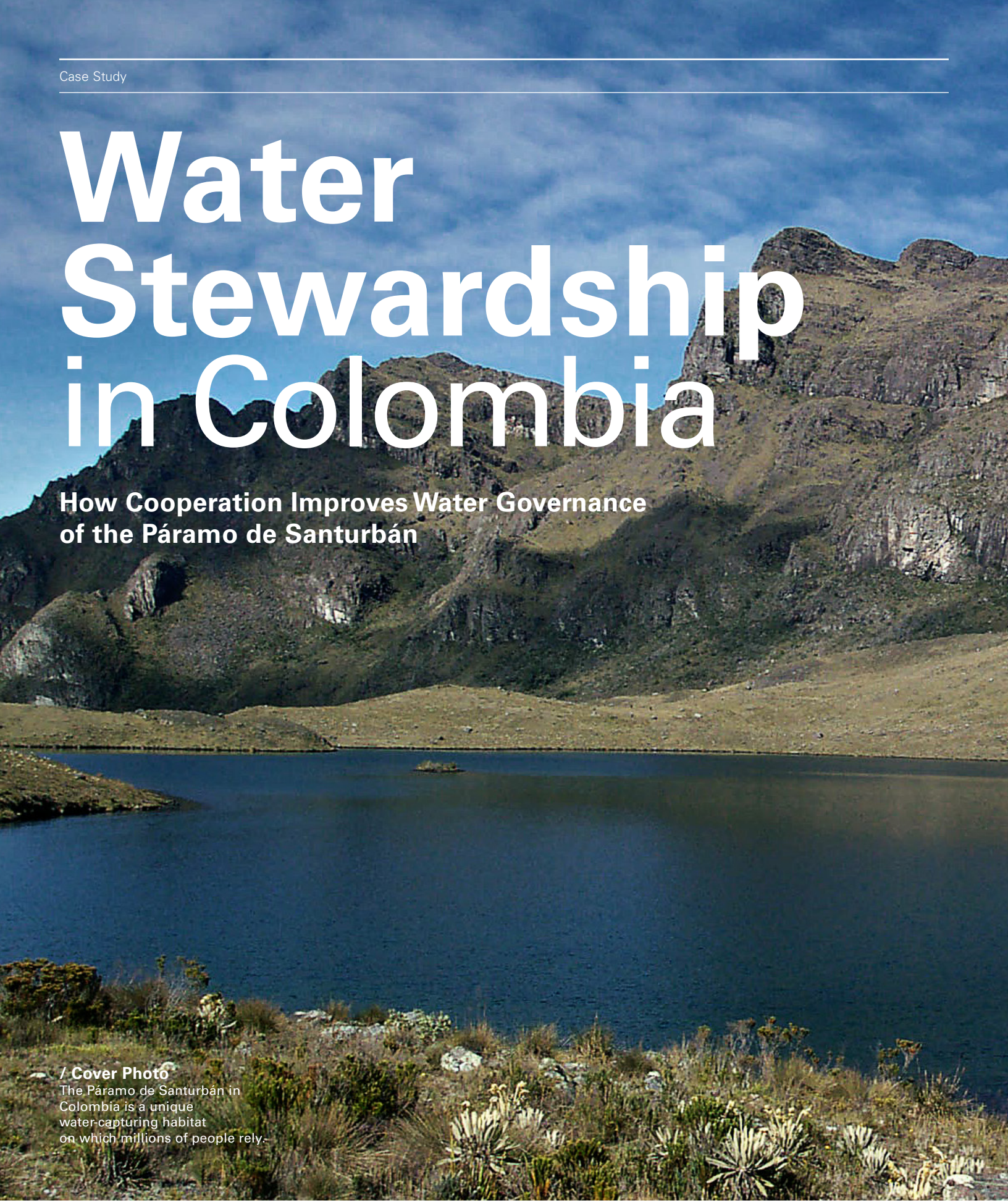
Case Study

Water Stewardship in Colombia

How Cooperation Improves Water Governance of the Páramo de Santurbán



/ Cover Photo
The Páramo de Santurbán in Colombia is a unique water-capturing habitat on which millions of people rely.

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Introduction

Climate change, population growth, and land use changes are the main stressors influencing water security worldwide. In 2015, the World Economic Forum ranked water crises as top global risks, and water problems are predicted to become more severe and pandemic in the future. Appropriate water management and distribution will require detailed knowledge of future water demand and supply under uncertain environmental change. Understanding and improving water security, however, is a complex task, as many drivers of water security are interrelated at the global and local scale.

In the Norte de Santander and Santander departments of northeastern Colombia, the unique Santurbán Páramo mountain grasslands supply a rapidly changing population with critical water resources and ecosystem services. Yet unsustainable land use practices, discharge of untreated wastewater, and illegal mining affect the ecological health of the páramo ecosystems and jeopardize the crucial water-provisioning, purification, and regulation functions on which all downstream residents depend. To address these threats to water security, multiple actors in the region have joined together to adopt a water stewardship approach to protect local water resources. Taking immediate action also makes economic sense—delaying interventions such as water stewardship and conservation now could cause significant ecosystem degradation, and water contamination and shortages, hurting economic and social prosperity and resulting in much higher restoration costs in the future.

In 2015, local, national, and international actors from the public, private, and civil sectors joined together in a collective effort to explore options to address competing needs and established a multi-stakeholder cooperation platform known as the Alianza BioCuenca. The partnership's objective is to protect and ensure the future sustainability of water resources by establishing a multi-stakeholder cooperation platform to improve water governance, and by adopting a water fund framework in which downstream water users contribute to a trust fund that finances water security measures.

/ Human activities in the highland areas above the town of Cácota have transformed the páramo, negatively affecting water quality and quantity downstream. Credit: © Sebastian Sunderhaus, GIZ 2015

Water Stewardship Approach

Water stewardship aims to improve water security by building partnerships in which stakeholders take shared responsibility, pursue meaningful individual and collective actions, and ensure that water is used in socially equitable, environmentally sustainable and economically beneficial ways. Such multi-stakeholder partnerships include actors from civil society, the private sector, and government officials (Figure 1) with a shared interest in finding solutions to complex water security challenges, to ultimately improve environmental policies and water governance.

Water Stewardship

Goal: Promote, facilitate and advise partnerships in sustainable water resource management

/ Figure 1
Water Stewardship Approach: Key actors from the public, private, and civil sectors cooperate to reduce common water risks. Credit: GIZ

To best address local water-related risks within the various sectors of society, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) facilitates multi-stakeholder processes on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

The partnerships are organized within a Strategic Alliance funded by develoPPP.de, a BMZ program that fosters public-private partnerships. Within these partnerships, stakeholders collaborate and agree on collective engagements to address local causes of water-related risks. These engagements could include the development of multi-sector water resource management plans or integrated approaches to new water resource infrastructure.

Water intensive businesses recognize that addressing these broader causes of risk require collaborative approaches. By engaging in multi-stakeholder partnerships to reduce the drivers of their water risks, businesses minimize their exposure to physical, regulatory and operational risks within their operations and supply chains, ensuring a more stable future. In Colombia, for example, the beverage and beer company Bavaria has joined forces with GIZ's water stewardship program, to reduce its own and regional water risks by facilitating conservation of the Páramo de Santurbán.

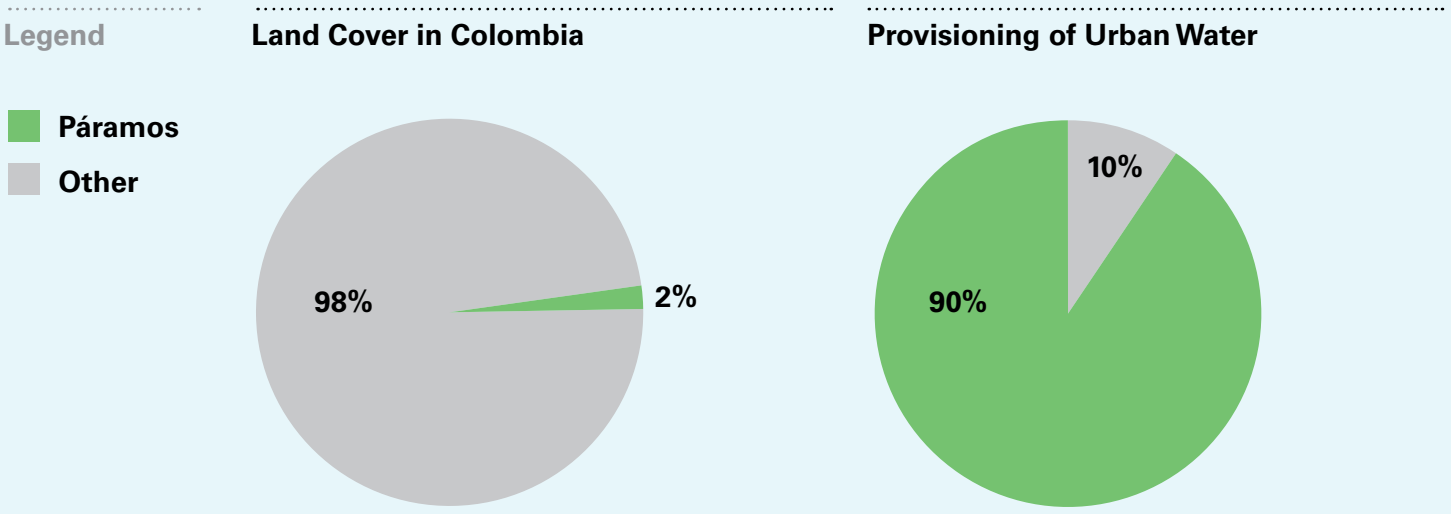
How can water stewardship lead to better water governance?

Engaging in a multi-stakeholder platform creates an environment in which stakeholders can share experiences, exchange knowledge, and generate new ideas for improving water security and reforming policies and practices related to water use. The participatory and transparent decision-making process facilitates constructive dialogue on complex topics between diverse groups, improving accountability systems and thus water governance. If decision makers engage with all stakeholders when developing new policies, these policies are more likely to succeed and attract broader ownership. Likewise, economic and physical risks of reduced water supply and compromised quality can be addressed within these multi-stakeholder platforms through the financing and implementation of conservation activities.

The Importance of Páramos in Colombia

Páramos are high-altitude (2,800 – 4,500 meters above sea level) tropical grass- and shrub-lands specific to Central and South America. They are of critical importance because they capture and retain water, act as flood buffers, and deliver a steady source of high quality water to densely populated downstream areas. While Colombia's 34 páramos cover less than two percent of the country's total area, they produce an astounding 90 percent of the clean water serving the country's cities (Figure 2).

A Significant Water Supply from a relatively Small Area



/ Figure 2
Páramos account for little land area in Colombia, but are the principal source of water meeting urban needs.
Credit: Design: GIZ/ Jiani Lu

The Páramo de Santurbán

In northeastern Colombia, the Páramo de Santurbán, spans across the Departments of Santander and Norte de Santander, covering about 1,300 km^2, or more than 0.125 percent of the country's total land area. Seventy percent of the Páramo de Santurbán lies within the borders of Norte de Santander, where its waters flow into rivers such as the Zulia and Pamplonita, which eventually empty into Lake Maracaibo of Venezuela. One million people in 21 municipalities live within the Zulia and Pamplonita watersheds. Eighty percent of them live in downstream areas, including the residents of the border city Cúcuta, Colombia's 6th largest city (pop. 800,000).

The páramo also has an economic importance for the thousands of people who live in or from its resources. Ninety-five percent of the Santurbán highlands region's inhabitants live from traditional forms of agriculture and artisanal mining.

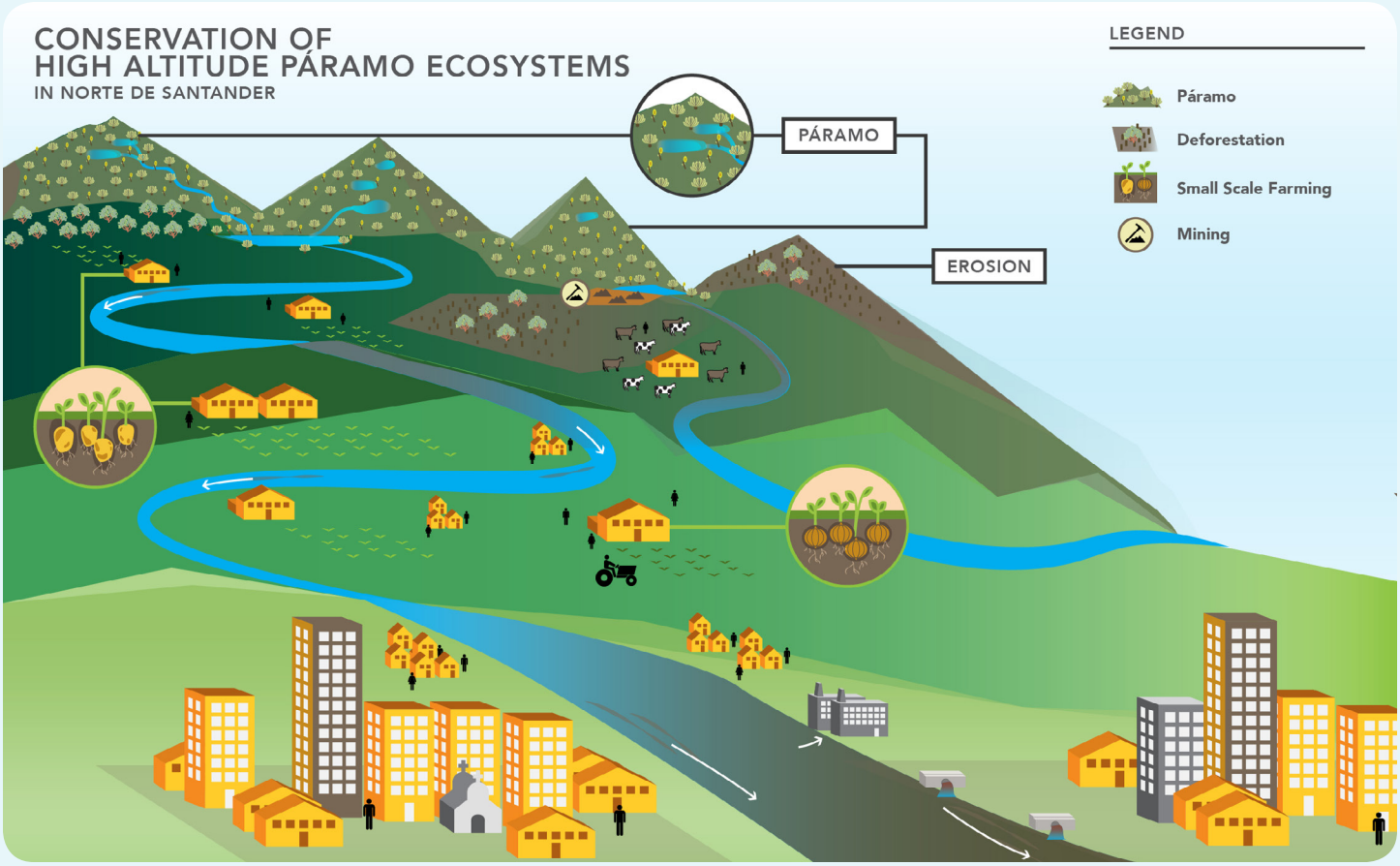
In total, around two million people in Colombia and Venezuela depend in whole or in part on water originating in the Páramo de Santurbán.

The Páramo de Santurbán Watershed in Numbers

Size of Páramo de Santurbán	**1,300 km2**
Extent of the Páramo de Santurban situated within the Department Norte de Santander	**70%**
Population of Cúcuta	**800,000**
Residents within the Zulia-Pamplonita watershed	**1 Million in 21 Municipalities**
Percent of them living in downstream areas	**Over 80%**
Total number of people depending in whole or in part on water originating from the Páramo de Santurbán	**2 Million**
Percentage of people living in the Páramo de Santurbán who depend on its natural resources for their livelihoods	**95%**
Ranking of the Zulia and Pamplonita Rivers in terms of sediment load in their waters	**Top 10 out of 300+ Rivers in Colombia**

/ Credit: GIZ, data sources: PROMAC & DANE (Colombian National Administrative Dept. of Statistics)

Local Water Challenges in the Páramo de Santurbán



/ Figure 3
Water challenges in the Páramo of Santurban are caused by unsustainable farming, livestock grazing, and mining.
Credit: GIZ/ Jiani Lu

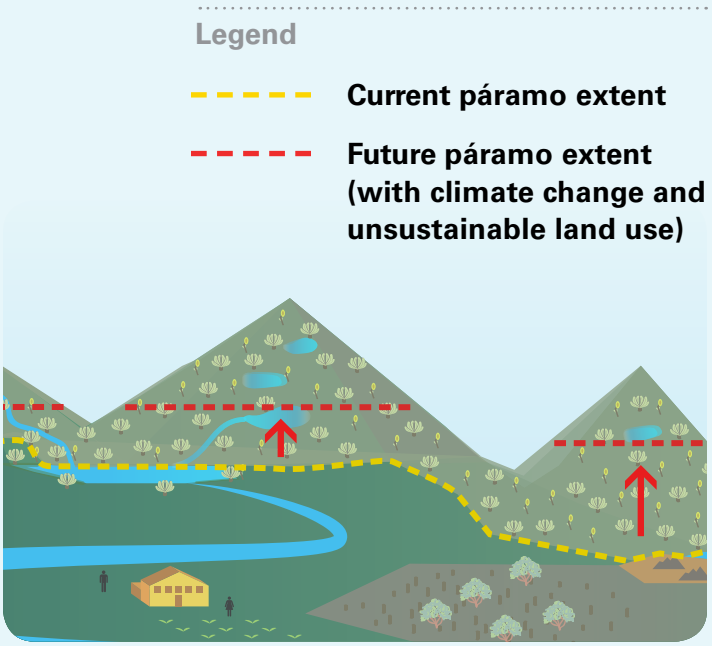
In recent years, human activities, including both traditional land uses and modern large-scale disturbances as shown in Figure 3, have caused significant disturbance to the ecological health of the fragile páramos. Unsustainable activities destroy the area's sponge-like soil, reducing its water holding capacity. Large-scale entrepreneurial agricultural firms lease the fragile lands for short-term exploitation, producing potatoes or onions for extra-regional markets, resulting in high erosion, washing soil into streams and rivers, causing downstream residents and businesses to pay more to purify their water. In fact, the Zulia and Pamplonita Rivers rank within the top ten (out of more than 300) Colombian rivers for their extremely high sediment loads. Lack of economic opportunity in the region is also increasingly driving the high rate of deforestation, which has doubled over the last twenty years.

How Climate Change Affects the Páramo

Moreover, climate change exacerbates the fragility of the local water situation in several ways. According to the IPCC, the average annual temperature in Norte de Santander is expected to increase by 3° Celsius by 2050, and 4.5° by 2080, with a global increase of 0.8° already having been observed (IPCC 2013). The increase in temperature will force an upward shift of the cold-adapted páramo plants restricted to limited mountain tops, leading to a decrease in the páramo area, and thus a decrease in the amount of water it can deliver (Figure 4).

In addition to temperature increases, the region is particularly vulnerable to climate change-induced extreme weather events such as torrential rains, causing greater flooding, as well as an increase in the frequency and duration of droughts. Scientists have observed that in dry years, the water supply in the Pamplonita and Zulia Rivers is reduced up to 62 percent compared to the annual average flow, indicating that these watersheds are particularly sensitive to drought and climatic variations (Estudio Nacional del Agua, IDEAM 2014). These alarming climate trends emphasize the importance of preserving the critical functioning of the páramo ecosystem for present and future water users.

Reduction of the Páramo Area and Function



/ Figure 4
Climate change and unsustainable land use result in reduced area of the páramo. Credit: GIZ/ Jiani Lu

The Need to Address Water Risks

Ensuring sufficient future water resources for business operations is crucial in the Cúcuta metropolitan region in northeastern Colombia, where economic development is a priority for improving local livelihoods. The Cúcuta Chamber of Commerce has recognized that water shortages lead to more competition for water resources between businesses and other water users, including the public, and has expressed its interest in addressing this challenge.

Sustainable watershed management also carries the advantage of improving overall safety and security in the region, a point of special importance for Colombia, a country with a history of ongoing violent conflict.

What are Water Risks?

Water risks include physical, reputational, and economic challenges that individuals, governments, or companies have to face in the case of interrupted, compromised, or reduced water quality or quantity. Within a single watershed, users may feel the impact of water risks in different ways, but their cause is shared and thus is best addressed cooperatively. The communities and businesses depending on the water and ecosystem services of the páramo are directly affected when these extreme events or water shortages occur.

Water Risks in the Páramo de Santurbán

Water users in the Páramo de Santurbán watershed face multiple risks, but not all risks are shared by all users (Figure 5). The physical risk of insufficient water supply is wide reaching, potentially affecting the public as well as the farmers and industries that depend on water for their supply chain.

Likewise, the risk of deteriorating water quality affects all water users and brings with it other hazards, including health risks and higher costs. Drinking contaminated water is harmful to human health. Industries requiring clean water face financial risks when forced to pay higher treatment costs, potentially rendering their supply chain unprofitable. Moreover, when industries or agricultural producers are found responsible for water contamination, they face the risk of reputational damage and loss of public confidence, which can result in loss of profits or even violent conflict.

Additionally, the physical risk from extreme events, such as torrential rains and flooding, is heightened if the regulatory function of the páramo is compromised. A smaller or degraded páramo cannot hold as much water as a healthy one in times of heavy precipitation. Without the páramo's ability to slowly release waters after the end of a storm, streams could easily overflow their banks, causing flooding and landslides and harming residents and their livelihoods across the catchment. In the case of drought, a risk of food insecurity exists for entire communities dependent on agricultural products irrigated with water from the páramo. A páramo with a compromised water-retaining capacity may be unable to release and deliver water to farmers dependent on it during dry seasons, thus potentially upsetting an important value chain for delivering food and agricultural inputs for the region's industries (such as the beverage industry).

Concerns Based on Water-Related Risks, by Sector

/ Figure 5
Individuals coming from different stakeholder groups have unique concerns regarding water-related risks and the wider impact of interventions addressing them. Credit: GIZ

Alianza BioCuenca

The Alianza BioCuenca, an innovative multi-stakeholder cooperation platform established in June 2015, seeks to restore and protect the Páramo de Santurbán and the watersheds originating therein. Within the partnership, actors from the public and private sectors and civil society, including representatives from downstream water user groups and upstream communities, collaborate to protect common water resources. Following the example of water funds created in Quito, Lima, and Medellín, the Alianza BioCuenca is focused on establishing a transparent cooperation platform that collectively finances and administers programs and projects to conserve and restore areas of importance for the sustainability and quality of water originating in the Páramo de Santurbán.

Alianza BioCuenca's Water Stewardship Strategy:

- **Identify and prioritize strategic actions** essential for the conservation of water coming from the Páramo de Santurbán.
- **Engage key stakeholders** with necessary resources to implement defined environmental goals that improve the hydrological sustainability of the region.
- **Implement local and regional programs** that promote the conservation of water resources in the priority watersheds.

Stakeholders

Key stakeholders in Santander and Norte de Santander represent diverse interests in the region and sometimes hold differing opinions and priorities for how land and water resources should be managed. These stakeholder groups include:

Civil Society

- Highland residents with land-dependent, traditional livelihoods
- Ranchers
- Downstream residents
- Non-residents depending on products or services generated in the region and exported elsewhere
- Non-residents concerned about ecosystem and biodiversity conservation

Private Sector

- Potato, onion, and rice farmers
- Industry engaged in water-dependent activities (including the beverage industry)
- Other Industry with land-dependent activities

Public Sector

- Water utility providers
- Electricity utility providers (hydropower operations)
- Local government
- State and national government

Institutional Framework of the Partnership

Beneficiaries Rural & urban residents, area businesses, customers of area businesses

Facilitators

- The GIZ Environmental Program Colombia (PROMAC)
- The Strategic Alliance for Water Stewardship in Multiple Sectors
  - Implemented by the GIZ
  - On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)
  - Through funding from developpp.de, a BMZ program that fosters public-private partnerships

Signing Parties

- Department of Norte de Santander, Colombia
- CORPONOR (Corporación Autónoma Regional de la Frontera Nororiental)
- Ministerio de Ambiente y Desarrollo Sostenible
- Mayors Office of San Jose de Cucuta and its Water Works EIS (Empresa de Acueducto y Alcantarillado de Cúcuta S.A. E.S.P.)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
- Bavaria S.A.
- Chamber of Commerce of Cúcuta

The Alianza BioCuenca's primary objectives for addressing water risks and protecting the Páramo de Santurbán:

1. **Establish binding and sustainable financing mechanisms, including a water fund and a water benefit credit platform.**
2. **Strengthen environmental/water governance and support regional and local authorities in the region.**
3. **Develop a participatory common vision on regional sustainable development that takes into account the needs and demands of the residents.**
4. **Enable the private sector and citizens to contribute to environmental protection and meet their social responsibilities.**
5. **Prioritize conservation activities based on scientific assessments of efficacy of interventions.**

Risk Reduction Measures Using Water Fund Resources

To address the specific situation in Santurbán and the water risks facing the region, the Alianza BioCuenca is focused on the following interventions:

Studies/Monitoring

- Technical support in watershed assessments
- Implementation early-alert systems for flooding

Adaptation/Socio-Economic Interventions

- Capacity building and farmer training to modernize and introduce sustainable practices to traditional agricultural and land-use sectors
- Identification, planning, and development of agroforestry
- Educational support to promote environmental culture and efficient use of water resources
- Payments to highland residents for ecosystem services delivered/changes to more sustainable land uses

Conservation/Ecosystem Management

- Legal delineation of the Páramo de Santurbán ecosystem for its protection
- Restoration of sites of ecological importance
- Installation of sediment reduction structures such as live barriers or infiltration trenches
- Commercial reforestation projects
- Acquisition and maintenance of strategic areas

Institutional Facilitation

- Facilitate dialogue between the public sector, private sector and civil society to meet local socio-economic demands and improve water governance
- Assist public institutions in the planning of integrated watershed management practices of the rivers Zulia and Pamplonita, and other rivers in the future
- Multi-stakeholder investment plans

Achievements

Economic Games for cooperative problem solving

On February 19th, 2015, key stakeholders from the public, private and civil sectors came together in a GIZ-facilitated workshop to establish the agreement for the management of the Páramo de Santurbán. More than 80 participants engaged in a series of economic games designed to help them understand their own and each other's roles and interests in conserving the páramo's water resources. The cooperative activities and challenges, such as the spending activity shown in the photograph, demonstrated the importance of collective action to identify concrete steps to address the causes of their shared water risks.

/ Over eighty participants from different stakeholder groups engaged in a day of economic games simulating the cost of resource protection, which facilitated a group consensus for next steps in establishing a Cooperation Platform and Water Fund. Credit: © CORPONOR 2015

This method of cooperative problem solving, with diverse stakeholders role-playing the watershed's other partners, provided a safe space for actors to explore multiple points of view and engage in open dialogue. The activities promoted discussion and reflection, causing the actors to recognize their common interest and the impacts that each activity of an individual could have on the shared water supply. The actors reached a consensus regarding páramo conservation activities they could jointly pursue. The top priority for all actors involved was the establishment of a formal cooperation platform and water fund to finance ongoing activities.

Achievements

Launch of Alianza BioCuenca

On World Environment Day 2015 – only four months after the initial workshop – the Alianza BioCuenca was publicly launched in the presence of Colombian Minister for the Environment Gabriel Vallejo and established the sustainable water fund to protect the Santurbán Páramo, as seen in the photograph. Local institutions and private sector companies voluntarily and transparently pledged their financial commitment to the Alianza.

/ Representatives from the public, private, and civil sectors convened on June 5, 2015 to sign a memorandum of understanding, launching the cooperation platform Alianza Biocuenca to conserve the páramo. Credit: © Alianza BioCuenca 2015

By publicly pledging their support to the conservation efforts, stakeholders agreed to be held accountable by the community for their commitments.

The planning process for the first reforestation project started immediately after the launch. The partners from the Bavaria brewery and the regional environmental cooperation body CORPONOR will reforest a part of the Santurbán Páramo located within the municipality of Arboledas.

The Alianza BioCuenca is currently seeking additional partners to increase its conservation activities and capacities. It is currently exploring the possibility of having regional funds matched at a national or international level, through a water credits scheme based on the 'water footprint' concept. 'Water footprinting' accounts for the total amount of water required to produce a product (such a bottle of beer). By purchasing water credits aligned with the water-footprint of what they buy, water users can offset their water use by funding conservation activities, such as those of the Alianza BioCuenca, that protect water resources.

Next Steps

Ultimately, the Alianza BioCuenca seeks to strengthen water governance, increase living standards of highlands inhabitants, and reduce degradation of the páramo.

Several critical next steps to ensure the longevity of interventions in the Páramo de Santurbán have already been identified:

- Participation of highland residents in environmental protection activities;
- Transformation of highland livelihood activities into sustainable forms, with the aid of projects establishing alternatives to artisanal mining and unsustainable grazing or land leasing for intensive agriculture;
- Development of sustainable practices for the integrated management of the Rio Zulia, Rio Pamplonita, and other watersheds to improve the conservation of the páramo by incorporating local communities in land-planning exercises;
- Establishment of multi-stakeholder downstream water management plans that balance development activities, moderate use, and fair water allocation for all, while simultaneously planning for sustainable water supplies well into the future.

Conclusion: An Invitation to Join

The experience of the facilitators behind the establishment of the Alianza BioCuenca and other similar projects indicate that setting up a Water Stewardship Partnership is more of a journey than an exact process. Each watershed and its communities within are unique and thus must identify shared water risk strategies that fit the local situation. To develop the spirit of cooperation and trust that leads to good water governance and transparency, the water stewardship journey must be undertaken jointly by disparate groups from civil, public, and private sectors. Working together, they can build trust and resolve conflicts, and economically feasible environmental and social interventions can be explored once a cooperative platform of communication and decision-making is established.

Although all local situations are unique, it is safe to conclude that the key to success in water stewardship is cooperative participation. Thus, we would like to invite stakeholders to join us in addressing their own, their community's or their business' water risks. Water risks affect all stakeholder groups, regardless of whether they come from the Páramo de Santurbán or a large urban mecca on the other side of the globe. Much needs to be done to mitigate human impact on the planet, and working together to ensure the health of the ecosystems that deliver us our drinking water is a good place to start.

/ Back Cover Photo
The iconic flora of the páramo creates a spongey soil that captures, retains, and slowly releases water.

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