

STRENGTHENING WATER SECURITY IN HIGHLAND BOLIVIA:

Navigating Complex Social Dynamics to Ensure Sustainable Solutions for Irrigation and Drinking Water

CLIMATE DELIVERY INITIATIVE SERIES //

Case Study CIF Program: PPCR

TOPICS

- Resilience-Building
- Water Security
- Infrastructure

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PROJECT DATA

PROJECT TITLE	Multipurpose Drinking Water Supply and Irrigation Project for the Municipalities of Pucarani, Batallas, and El Alto
PARTNER ORGANIZATION/S	Inter-American Development Bank (IDB)
COUNTRY	Bolivia
SECTOR/S	Water; Resilience-Building
TOTAL PROJECT COST	USD 86,145,136.00
PROJECT DURATION	2016-2025

DELIVERY CHALLENGES	 Opposition and Lack of Consensus Intra-Governmental Coordination and Legal Frameworks Data Availability
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KEY MESSAGES

Enhancing water security: Shifting patterns of water availability have made it crucial to construct and rehabilitate infrastructure to ensure equitable water access for rural communities and urban users.

Managing social dynamics through inclusive, transparent, locally-led, and context-adaptive negotiation mechanisms for sustainable resolutions. To achieve successes, the project engaged carefully and respectfully with various stakeholders, negotiating with communities to ensure community acceptance and smooth implementation.

Building trust through demonstrated commitment and effective communication: The project implemented small sub-projects that delivered tangible benefits for community resilience and livelihoods and helped build trust. It engaged continuously with communities to ensure community approval and buy-in.

EXECUTIVE SUMMARY

This case study examines the "Multipurpose Drinking Water Supply and Irrigation Project for the Municipalities of Pucarani, Batallas, and El Alto" in Bolivia. This project was launched in 2016 by the Inter-American Development Bank (IDB), with financing from CIF's Pilot Program for Climate Resilience (PPCR).

The project has sought to provide water for drinking and sanitation in El Alto, Bolivia's second largest city, and to improve irrigation and water supply in rural communities in the municipalities of Pucarani and Batallas, in the Jacha Jahuira and Khullu Cachi river basin systems. Under the project, water from the Jacha Jahuira and Khullu Cachi watersheds would be accessed to supply a new water treatment plant in El Alto, ensuring water supply for over half a million people, while also providing improved water supply to Pucarani and Batallas.

This intervention responded to critical development challenges by enhancing water security for rural and urban communities in Bolivia. Shifting weather patterns and shrinking glaciers threaten water supply across Bolivia's Andean highlands. In El Alto, urban growth and migration has strained available water resources, while in Pucarani and Batallas many households have lacked improved water sources, and aging irrigation infrastructure has posed a threat to rural livelihoods.

The project was designed to address these challenges through an intervention comprising three components:

- **Component I** aims to provide drinking water in the municipalities of El Alto and Batallas.
- **Component II** focuses on modernizing and improving irrigation systems in Batallas and Pucarani.
- **Component III** implements sustainable and comprehensive watershed management and land use through the creation of watershed management plans. Financed partly through a grant from the Nordic Development Fund (NDF), this component enables community-led future-proofing initiatives, organizational strengthening, and sustainable basin management.



Implementation has faced three main delivery challenges, largely related to social and micropolitical dynamics.

DELIVERY CHALLENGE 1: Opposition and Lack of Consensus

The project had to find ways to manage a lack of consensus regarding water sharing among different stakeholders and jurisdictions. Members of rural communities in Pucarani and Batallas feared the possibility of rural-to-urban transference of longheld, vital water usage rights, partly because of long-standing gaps in trust. Many community members felt the need to secure specific economic benefits upfront in exchange for sharing water usage, and they could disrupt project implementation if these claims for compensation were not met. The project had to cautiously and delicately balance relationships among stakeholders to reach a consensus and enable it to move forward.

Implementation Solutions: To address delivery challenges related to community opposition and trust, the project needed to carefully negotiate agreements with rural communities. An enabling factor was the shift to a more adaptive management approach that focused on social dynamics and trust-building, coordinating with local municipal authorities to carry out extensive face-to-face negotiations with communities, and ensuring clear communication with communities about any agreements. While Component III was the smallest component in monetary terms, it made possible community engagement and small projects (e.g., women's entrepreneurship, plant nurseries, and animal husbandry) that were critical in building trust with the communities.

DELIVERY CHALLENGE 2: Coordination Among Government Entities and Legal Framework Challenges

Bolivia does not have a unified water law, but instead has a number of industry- and jurisdiction-specific laws, while in rural areas water usage is guided by usos y costumbres (i.e., customary use agreements negotiated among users). The legal framework for water is further shaped by the fact that the Bolivian constitution recognizes access to water as a right. Without a single framework to adjudicate competing claims to water, painstaking negotiations were necessary to overcome the stakeholder opposition discussed under Challenge 1. However, it was also necessary for government stakeholders to coordinate to meet claims for compensation, many of which (e.g., housing) lay outside the direct prerogatives of the project and the Ministry of Water and Environment (MMAyA).

Implementation Solutions: As there was not a single focal point to officially manage all crossinstitutional efforts, MMAyA played an important role in facilitating and coordinating agreements among government entities. To help enable community compensation, MMAyA and relevant vice-ministries helped coordinate with other ministries, such as the agency responsible for social housing, to deliver benefits to communities as agreements were reached. The project also worked to create the Technical Commission for the Operation of the Multi-Purpose Project (COTEMU) to address water disputes among stakeholders, although efforts to formalize this commission remained ongoing in late 2024.

DELIVERY CHALLENGE 3: Information Baselines and Technical Capacity

The project faced challenges related to availability of weather and environmental data, both at the design and implementation stages. Scarcity of such information represents a long-standing challenge in Bolivia, linked to outdated models and discrepancies in actual versus expected water availability.

Implementation Solutions: The project responded by implementing measures to strengthen information collection and build capacity. It worked innovatively with researchers and academics in Bolivia to gather information and develop more accurate and up-to-date models. It established a network of partnerships with universities and research centers to enable more robust and consistent data collection, which could enhance project implementation and, in the longer term, contribute to strengthening organizational capacity.



RESULTS

By April 2024, approximately 82 percent of the total infrastructure works had been completed, and progress was made on construction and expansion of the two main dams that were part of the project. Improved drinking water systems had been set up in 13 communities, and improved irrigation systems were largely in place. Forty-two kilometers (km) of water pipes to carry water to the treatment plant in El Alto had been laid, with only six km left to be completed due to ongoing negotiations. Originally scheduled to close in September 2024, the project requested an extension in April 2024 to complete the planned infrastructure works and solidify organizational arrangements for infrastructure management and management of water resources. Components I and II were extended to August 2025, while Component III was extended to December 2024.

The experience of the project suggests some key lessons, including:

- 1 **Lesson 1:** Investment in communication and socialization is crucial to enable implementation of projects in a socially complex context.
- 2 **Lesson 2:** Implementing robust mechanisms for interministerial coordination is essential for projects that require inputs from many ministries or state agencies.
- 3 **Lesson 3:** In programs with a high degree of technical and social complexity, the contractor plays a critical role; its interaction with project stakeholders, especially with communities, should be continuously monitored and supervised.
- 4 **Lesson 4:** Multi-component projects should be carefully structured to ensure that components support one another effectively.
- 5 **Lesson 5:** Project management, through its attention to social dynamics, played a critical role in driving project successes.

LIST OF ABBREVIATIONS

COTEMU	Technical Commission for the Operation of the Multi-Purpose Project/Comisión Técnica de la operación del Proyecto Multipropósito
EMAGUA	Entidad Ejecutora de Medio Ambiente y Agua/Environment and Water Executing Agency
IDB	Inter-American Development Bank
MMAyA	Ministerio de Medio Ambiente y Agua/Ministry of Environment and Water
NDF	Nordic Development Fund
PPCR	Pilot Program for Climate Resilience
SPCR	Strategic Program for Climate Resilience

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1. INTRODUCTION

Shifting weather patterns and shrinking glaciers have affected water supply across the highlands of Bolivia and the department¹ of La Paz. These changes have affected major population centers, including the city of La Paz and its neighboring city of El Alto, which sprawls across Bolivia's high plateau (altiplano) over 13,000 feet above sea level. El Alto, previously a suburb of La Paz, has grown into Bolivia's second largest city, home to nearly 1 million inhabitants. The confluence of these shifts with urban population growth has confronted the city with the high risk of shortfalls in water supply. This case study examines how a water infrastructure project financed by the Inter-American Development Bank (IDB), the "Multipurpose Drinking Water Supply and Irrigation Project for the Municipalities of Pucarani, Batallas, and El Alto," has worked to address the critical challenge of increasing water security in El Alto and in rural communities west of the city.

The contract between the Bolivian government and the Inter-American Development Bank to finance the initiative was signed in January 2016. The operation was supported by the CIF's PPCR. The project, referred to by implementers and community members as the "Proyecto Multipropósito" (i.e., "Multipurpose Project") in Spanish, or simply as the "Multipropósito," sought to bring drinking water from two river basins (the Jacha Jahuira and Khullu Cachi systems) 42 kilometers to El Alto, thereby benefiting over half a million people with improved water access. The Multipropósito also aimed to provide drinking water and improve irrigation in the municipalities of Pucarani and Batallas, where water security is threatened by shifting weather patterns and melting glaciers. Therefore, the project aimed to better prepare targeted communities to withstand extreme weather events (e.g., droughts and floods) and water shortages, while also contributing to resiliencebuilding efforts in Bolivia more broadly.

The project launch followed extensive social assessments, outreach, and negotiations with communities where the project would operate. The campesino communities that dot the altiplano between the glaciers of the Cordillera Royal and the dusty brick expanse of El Alto held water rights in the Jacha Jahuira and Khullu Cachi systems, and their authorization and participation was a key condition for project approval. Even after agreements were reached, however, some community members feared that the project represented an extraction of their water stocks to benefit the city, and they demanded compensation or threatened to block the project. Despite the extensive social assessments and negotiations with communities, mistrust remained, with the potential for grave consequences for the project, in the form of the prevention of infrastructure construction through road blockades.

Considering these social dynamics, ongoing outreach has been necessary to (i) ensure that communities felt their demands and concerns were heard; (ii) reassure communities of the project's benefits; (iii) build trust; and (iv) demonstrate the state's commitment to reaching an equitable solution to disagreement. Extensive negotiations undertaken by Bolivian government authorities, and supported by the IDB's social engagement teams, enabled the project to secure assent from the communities and materialize its benefits, including through provision of services such as improved drinking water and rehabilitated irrigation systems. However, as the project progressed, other differences emerged, and the process of building trust among actors and negotiating with individuals and communities has continued throughout its lifespan. To address the possibility of social conflict and disagreement over



water resources, with different users and project participants taking irreconcilable stances, the project needed to emphasize effective communication and the delivery of benefits to all actors to build trust and gain consensus for successful implementation.

The Multipropósito made extensive infrastructural investments, including expanding dams, constructing water treatment plants, laying down pipes to transport water, and refurbishing irrigation systems. However, its implementation has not merely posed engineering challenges; it has also been shaped by the need to navigate sometimes contentious social dynamics and differing interests. Upstream communities in the municipalities of Batallas and Pucarani have contested what they, in some cases, feared as potential encroachments on their water use rights. At the same time, stakeholders in El Alto felt a strong sense of pressure to secure the city's water supply for drinking and other needs. Overall, the major challenge has been to forge durable pacts to ensure the fair distribution of water among diverse sets of stakeholders. This case study examines how the IDB and its partners in the Bolivian government have tackled this delicate issue.

The experience of this project is relevant beyond the boundaries of the project area, and it offers insights for efforts in Bolivia, across the Andes, and globally to promote preparedness and build resilience in the water sector and in contentious socio-political contexts. Water projects, and projects navigating the rights to or distribution of natural resources, must often balance the interests and needs of different stakeholders, requiring patient and careful negotiation and communication to build consensus and reach a solution that can be accepted by all stakeholders. As efforts to help stakeholders become better prepared to withstand extreme weather events and build resilience increasingly focus on achieving more fair outcomes,² understanding how to navigate social dynamics, disagreement, contestation, and conflict, is vital. The Multipropósito shows one example of how to do so.



2. CONTEXT

Many parts of Bolivia, including the Andean highlands and altiplano where the Multipropósito operates, face water shortages and droughts that are expected to increase in the coming years. The Bolivian Andes are warming faster than other parts of the world,³ with the La Paz–El Alto area predicted to warm by a further two degrees Celsius by 2030. The glaciers in the mountains surrounding La Paz and El Alto, which supply these cities with part of their water, are visibly shrinking and losing mass. Some glaciers have disappeared entirely, while others have shrunk by nearly 40 percent between 1983 and 2006.⁴ With dramatic population growth in El Alto, the future is expected to bring increased water stress and higher demands on water resources.⁵

Strengthening resilience and preparing communities to withstand shifting weather patterns is a crucial concern for the Bolivian government, international partners, and—in the context of its overall investment program and its collaboration with the government— CIF and PPCR. The water sector advancement and the preparedness of communities amid high risks to water security are vital. The Inter-American Development Bank is the largest single partner in Bolivia's water sector, with a long history in the country.⁶

PPCR investments in Bolivia aim to strengthen water security and bolster the country's capacity to manage its water resources, focusing on river basins,⁷ and encompassing both infrastructure investments and efforts to strengthen institutional coordination. Bolivia is working to strengthen resilience by, for example, integrating extreme weather preparedness into national development plans, and creating the National Mechanism for Adaptation to Climate Change (NMACC), which identifies national priority preparedness areas. Investments under CIF's Strategic Program for Climate Resilience (SPCR) aim to bolster these efforts, including by supporting the NMACC. Efforts to strengthen government organizations and country-led processes to enable preparedness for extreme weather events are particularly important in the context of the Multipropósito, as different stakeholders described water as an especially complex sector. Water is a vital resource, whose use intertwines many interests, as shown by the words of one interviewed stakeholder: "talking about water is talking about conflict".⁸ Moreover, Bolivia confronts a number of organizational challenges related to water governance, including shortfalls in technical capacity, turnover, and a lack of intersectoral coordination.⁹ These gaps, among others, shaped the degree to which preparedness and resilience-building efforts could be effectively implemented.



2.1. Water Politics and Social Dynamics

Water security is deeply intertwined with social dynamics in Bolivia. As warming increases and water becomes scarcer, spikes in social conflict are becoming more common.¹⁰ Hence, considerations of contestation and negotiation have been key to the project's implementation, which, like other water projects in Bolivia, has been shaped by a range of formal and informal institutions and a high level of social movement mobilization (see box 1).

2.2. Development Challenge: Ensuring Water Supply

The project's core development challenge lay in ensuring water access for both rural (i.e., municipalities and campesino communities in Pucarani and Batallas) and urban areas. Since 2009, the municipal government of El Alto has been searching for new water sources to support its faltering water supplies. El Alto, a former suburb of La Paz, has rapidly grown into Bolivia's secondmost-populous city, surpassing La Paz and becoming second only to Santa Cruz de la Sierra. With around a million inhabitants, El Alto was projected to double in population in the next 20 years.¹³ The city is experiencing water shortages, which have led to suspensions of water service to nearly 40 percent of El Alto, and these are expected to intensify in the future. particularly with its population growth.¹⁴

Meanwhile, rural communities on the altiplano face their own challenges as weather conditions become increasingly unpredictable. The irrigation infrastructure on which rural communities rely is reaching "the end of its useful lifespan"¹⁵ and weather and environmental patterns are becoming more unpredictable.¹⁶ On the other hand, warmer temperatures may offer opportunities to expand agriculture with a wider range of crops.¹⁷ However, to benefit from this potential, communities will need support for water infrastructure. Moreover, leading up to project preparation, in 2012, many households lacked access to improved sanitation and drinking water.

BOX 1. Social Mobilization in Bolivia

Bolivia's social and political context includes high levels of mobilization among campesino (i.e., peasant smallholder)¹¹ groups and Indigenous Peoples organizations, as well as labor unions, urban associations, mining groups, and others. Communities play an active role in voicing their claims and rights and contesting development projects and policies that they believe fail to meet their needs.

The 2000 "Water War" in the city of Cochabamba represents the most emblematic and internationally recognized social conflict over water rights and use. During this confrontation campesinos and urban activists launched protests in the city of Cochabamba to contest the city's concession of drinking water and sanitation services to a private company, which was seen as receiving overly favorable terms and threatening access to water for both campesino irrigators and the urban poor.¹² The protests resulted in the cancellation of the concession, and this show of strength yielded influence for irrigator and campesino groups and other social movements across Bolivia. El Alto and La Paz also saw protests against water concessions in 2005, part of a broader wave of social contestation. These episodes illustrate the high profile of water issues in Bolivia, as well as the role of social movements in contesting and shaping water policy.

The intensity of this challenge was underscored by a severe drought in late 2016, which affected the department of La Paz. Starting in November of 2016, the majority of the city's population was subject to water restrictions. This crisis impacted the population of La Paz both from an economical and a health standpoint. Monetary damages from the 2016 drought crisis were estimated at USD 450 million,¹⁸ and at least 130,000 families were affected by water rationing during the 2016 crisis.¹⁹ This episode illustrated vividly the impacts of water scarcity, especially for the province of La Paz, and heightened the sense of risk to water security that was felt in Bolivia and in the affected municipalities. Moreover, the drought revealed gaps in effective response and areas where preparedness for similar events and resiliencebuilding could be enhanced by strengthening capacity and coordination among state institutions.²⁰

Addressing the water challenge requires not only technical engineering expertise, but also the forging of durable agreements across communities with sometimes divergent needs and interests. Addressing this development challenge requires economically and socially fair transformations, developed through broad-based participation of affected groups, ensuring benefits and burdens are distributed in a fair and equitable way.²¹ The Multipropósito has sought to address these multiple, interlocking challenges through an integrated "multipurpose" approach.

2.3. Defining the Intervention: Interlocking Components in the Multipropósito

The Multipropósito sought to ensure water supplies for the growing populations of El Alto, while also meeting the needs of rural communities who held, effectively, veto power over decisions regarding water sharing. This meant that agreements had to be negotiated with each community in the upstream municipalities of Batallas and Pucarani. The project aimed to obtain these rights by offering additional benefits to the rural communities in these municipalities, including rehabilitated and more efficient irrigation systems; improved access to rural drinking water systems in Batallas; income generation through the creation of small businesses and bringing local products to market; reforestation; and women's economic empowerment. The project focused not only on building infrastructure or engineered solutions, but also on social and political aspects, proposing positive-sum outcomes to thorny problems of water-sharing agreements in a context where water is highly politicized.

The Multipropósito comprises three components:

- 1 **Component I** aims to increase the provision of drinking water in the municipalities of El Alto and Batallas, including through financing dams, reservoirs, treatment plants, and pipes to carry water across the altiplano.
- 2 **Component II** focuses on modernizing and improving aging irrigation systems in Batallas and

Pucarani, including by lining them with cement and covering them to reduce water loss from evaporation. Irrigation improvements extend from the water sources to the fields, with communities and individuals thereafter taking responsibility for the small infrastructure works necessary to water individual plots.

3 **Component III** promotes sustainable and comprehensive watershed management (pertaining to water use, soil conservation, and preparedness for extreme weather events in these basins) through the development of watershed management plans for municipalities. These plans were informed by extensive community participation and consultation, incorporating community watershed management briefs within the broader municipal plans. As such, they helped identify key measures to address communities' needs while enhancing their resilience and preparedness for extreme weather events. Financially the smallest component of the project, funded by a grant of USD 4.7 million from the Nordic Development Fund (NDF), Component III focuses on community-led initiatives for watershed management planning. It aims to strengthen local institutions and enable the creation of a platform to ensure the long-term sustainable management of the basins.

Key actors and agencies included:

- MMAyA: the Ministry of Environment and Water (Ministerio de Medio Ambiente y Agua).
- EMAGUA: Environment and Water Executing Agency (Entidad Ejecutora de Medio Ambiente y Agua), an autonomous agency under the MMAyA, responsible for executing water and sanitation projects. EMAGUA was the primary implementor of the Multipropósito project.
- EPSAS: Drinking Water and Sanitation Company of La Paz and El Alto (Empresa Pública Social de Agua y Saneamiento de La Paz y El Alto). The Multipropósito aims to transfer long-term management responsibilities to municipalities and local water entities.²²



The project's three components are financed through a direct grant, a concessional loan for the infrastructure, the grant for basin management from the NDF, and complementary financing provided by the Bolivian counterparts connected to that component, including the municipal government of El Alto (which contributed to Component I), EPSAS (which contributed to Component I), and the departmental government of La Paz (which contributed to Component II). An additional example of the involvement of the Bolivian government was through contribution to social housing to help demonstrate its commitment to the program and obtain community support. The Multipropósito also envisioned the creation of a larger coordinating body to bring together a wide range of stakeholders for sustainable water management in the project area and other watersheds. This body, known as the Technical Commission for the Operation of the Multi-Purpose Project (COTEMU), aims to provide a platform for stakeholders to coordinate among themselves and manage any conflicts that might arise, and is, therefore, seen as vital to the project's sustainability. In mid-2024, efforts to institutionalize the COTEMU were ongoing.



3. DELIVERY CHALLENGES

The Multipropósito faced several complex delivery challenges²³ throughout its implementation. Most importantly, the project needed to navigate the complex social dynamics of La Paz department, seeking to reconcile the needs and interests of a range of stakeholders with differing views and divergent stances toward the project. The complex needs of socializing the project presented communication challenges. The institutional framework presented complexities to navigate. Finally, gaps in information baselines, and the need to strengthen technical capacities, presented minor challenges that required the IDB and its government counterparts to strengthen these aspects.

3.1. Delivery Challenge 1: Opposition and Lack of Consensus

The most central delivery challenge faced by the project has been the management of a lack of consensus on water sharing among different stakeholders and jurisdictions. Rural communities perceived and feared rural-to-urban transference of long-held, vital water usage rights, partly due to long-standing gaps in trust toward state institutions. In turn, many community members felt the need to secure, upfront, specific economic benefits to offset potential risks and losses. On the other hand, not all demands for compensation would prove possible for project implementors to meet. Project delays also led stakeholders in El Alto to express impatience. These concerns had to be carefully balanced to reach a consensus and enable the project to move forward.

3.2. Delivery Challenge 2: Coordination Among Government Entities and Legal Framework Challenges

Addressing community concerns and opposition required the IDB and EMAGUA to navigate delivery challenges related to Bolivia's legal and organizational framework for water.

Bolivia's current water law (i.e., Ley de Aguas) was established in 1906. It contains little detail on technical issues and how to determine what water rights adhere to whom. More recent laws have focused on specific water uses (e.g., irrigation, drinking water), the protection of water, regulation of water and sanitation services, and certain sectors (e.g., electricity, mining).²⁴ In rural areas water usage is guided by usos y costumbres (i.e., customary use agreements negotiated among users), which can introduce other challenges, including, at times, a lack of a clear framework to adjudicate competing claims to water. Effectively, upstream users gain significant advantages regarding water use. This required painstaking negotiations to overcome the stakeholder opposition discussed in section 3.1. The legal framework for water is also shaped by the fact that the Bolivian constitution declares water to be a fundamental right for all.²⁵ The Bolivian state is thus responsible for water management and for ensuring the realization of the right to water; but to do so it must contend with organizational shortfalls, including capacity gaps and a lack of intersectoral coordination.²⁶

Coordination issues among institutional stakeholders, including government entities, were particularly important, as communities requested different forms of compensation, many of which lay outside the project's and MMAyA's direct prerogatives. Since no pre-determined architecture existed to provide these compensatory benefits, their distribution depended on the creation of new agreements among government ministries and agencies. However, without an official, designated focal point to coordinate these efforts, government agencies and entities had to develop new forms of cooperation.



3.3. Delivery Challenge 3: Information Baselines and Technical Capacity

The project faced challenges related to availability of weather and environmental data, a long-standing challenge in Bolivia,²⁷ which necessitated measures to strengthen information collection and build technical capacity. Information weaknesses called for the update of models, as the availability of water was in some cases less than expected.²⁸ While analysis carried out for the SPCR in 2011 noted gaps in the availability and reliability of hydro-climatological information,²⁹ the persistence of this challenge gave rise to innovative solutions and new analysis of glaciers in the region (further discussed in section 5).

4. TRACING THE IMPLEMENTATION PROCESS

This section traces the implementation of the Multipropósito, examining the challenges encountered and the solutions developed to address them. The origins of the project go back to 2010, when the municipal government of El Alto began its search for new sources of water. By 2012, initial consultations and validation of the technical proposals were in progress; and in 2016, the formal agreement between the government of Bolivia and the IDB was signed, the first disbursements were issued, and the project started in earnest.

While the project undertook a deliberate approach, based on extensive, and often lengthy, stakeholder consultations to ascertain community needs and socialize the proposed interventions, it was also in these consultations that community opposition and disagreements became evident.

4.1. Laying the Groundwork for the Project and Initial Challenges

The Multipropósito underwent a long preparation phase, during which technical feasibility studies, social assessments, and social outreach were carried out, including examinations of the water basins near El Alto, social assessments in the surrounding areas, and extensive consultations with communities. During this period, inter-ministerial agreements were established to enable coordination, execution, and disbursement of funds. The heart of the story, however, lies in efforts to reach agreements with community members, whose position as upstream water users gave them significant leverage over downstream access and usage. Communities felt a strong sense of ownership over water resources and were acutely aware of water's critical role in sustaining their livelihoods. The salience of this issue has increased with the high risk faced by the water basin;

residents are aware of increasingly unpredictable weather and rainfall patterns and increasing water scarcity.³⁰ Thus, many community members feared for the impact on their livelihoods, believing that the project could lead to the transfer of "their" water to El Alto and leave them without sufficient water—even though that was not the intention of the project.

During project preparation, representatives of the Bolivian government, alongside the IDB's Environmental and Social Safeguards Unit, carried out consultations and negotiations with community members. By 2015, initial agreements on a watersharing formula had been reached, establishing that approximately 40 percent of the Jacha Jahuira and Khullu Cachi watersheds' stock could be used by El Alto, and 60 percent would be retained for use by Batallas and Pucarani. Meanwhile, the Multipropósito would provide additional irrigation and drinking water infrastructure in the communities of Batallas and Pucarani—an agreement that, together with the 40–60 formula, aimed to provide a framework for water-sharing.³¹

4.2. Addressing Delivery Challenge 1: Opposition and Lack of Consensus

As the project began implementation in 2016, it was clear that negotiations on water-sharing would remain ongoing, and that commitments and compensations might be subject to revision. Communities saw the project as an opportunity to negotiate with the state to secure needed benefits in exchange for their cooperation.³²

Moreover, community leaders had a strong incentive to put forward additional demands for compensatory benefits. In many Andean communities, authorities rotate each year. Stakeholders explained that these community heads and representatives typically feel pressure from their constituents to deliver some kind of benefit, and to present concrete improvements for the lives of community members.³³ Each new group of community authorities might, therefore, put forward new compensation claims and requests.

When the construction of infrastructure required the use of private land, payments or other forms of compensation had to be made to the landowner(s). In cases where infrastructure passed through communally used land, compensation had to be negotiated with the community. Given the sensitivity of water-use rights and the leverage in negotiations held by organized communities, who could physically block or even damage infrastructure, it was imperative to sustain open communication among stakeholders and uphold the agreements made between the communities and project actors. If communities did not perceive concrete and direct benefits from the project, they would resist participation in it. Moreover, if benefits or compensation previously committed by the project were delayed, community members felt that seeking additional compensation for what was perceived as non-compliance with the original agreement was justified.

Negotiations could be difficult, as community members often distrusted government entities and were, therefore, uncertain about the benefits of the project for them. Some community members evinced a particular distrust toward EPSAS, which they perceived as serving only the interests of El Alto and offering no benefits for the rural communities. This distrust was important to reckon with, despite EPSAS personnel not intending to simply take water away from the communities. In fact, EPSAS personnel expressed the perception that their role was to offer a broadly beneficial service, as access to water is recognized as a right in Bolivia's constitution.³⁴ These perceptions and deficit in trust represented an important barrier that needed to be addressed. In particular, if community members felt or perceived that their needs were not being met, agreements were being broken, or trust was being abused, they had the capacity to block infrastructure construction or deny

access to the community altogether. In many cases, work had to stop because communities imposed a halt—a practice referred to as placing candados, the Spanish word for "padlock." The duration of the candado depended on how satisfied communities were with the answers they received regarding their demands, as well as the speed with which an agreement was reached. This dynamic between communities and the state halted the implementation of project works in several cases, leading to significant delays, which in turn frustrated water users in El Alto, who would benefit from the completion of new infrastructure to supply water to the city. Indeed, some social organizations in El Alto claimed that individuals or groups within rural communities were deliberately obstructing water access for their personal gain.³⁵

Efforts to navigate these currents of competing interests, rural micropolitics, and historical perception, and to construct a unifying consensus, shaped the Multipropósito, which pursued multiple strategies to engage communities and move the project forward.

4.2.1. Overcoming Challenges Through Social Strategies

By 2017, the project had started to gain greater momentum, with project documents from this period noting that initial work had begun on smaller projects that had been agreed upon with communities. Implementation, however, still needed to navigate certain community demands, which the communities viewed as necessary to protect and improve their access to water and development benefits, respectively. The implementation of the Multipropósito presented communities with opportunities to engage with the state and put forward claims to compensation for the water that would reach El Alto, the use of land, and perceived negative impacts on or disruption of the communities due to construction, noise, and dust, or even inadvertent offenses by contractors.

Meeting these claims required extensive processes of negotiation and discussion with communities, and considerable engagement to build trust. Strategies included responding to community requests and demands in a timely, but realistic, way; ensuring clear, respectful, and culturally appropriate communication; undertaking small-scale development projects to build trust and show the benefits of the project; managing coordination among all the actors that needed to participate in negotiating with communities and providing compensation and development benefits; and ensuring effective project management to implement the aforementioned strategies. The task of liaising with communities was taken on by EMAGUA, with a key role played by the Multipropósito's project manager. The project manager and other implementing staff needed to maintain constant communication with the communities, socialize the project to prevent the imposition of candados, negotiate the lifting of candados, and coordinate with state institutions to respond to compensation demands.

4.3. Addressing Delivery Challenge 2: Coordination Among Government Entities and Legal Framework Challenges

The compensation measures discussed in the previous sections took many forms, from providing houses to extending irrigation systems to the fields of community members. These initiatives necessitated the involvement of other ministries and government agencies, which had to be coordinated. In practice, coordinating functions were often undertaken by MMAyA officials, along with counterparts in other ministries, and by EMAGUA, which often signed interministerial agreements.

A recurrent demand from the communities was for granting free or subsidized houses, to be constructed by the state housing agency (AVIVIENDA). This meant that the MMAyA needed to reach out to AVIVIENDA to enable the construction of these houses in targeted communities. In some cases, EPSAS also helped fund construction.



Demands were shaped by specific community needs and desires and varied widely. However, not all demands could fall under the scope of EMAGUA's capacity, and some claims required certain agreements to be signed by other agencies or ministries. While vice-ministries within MMAyA helped negotiate such agreements, without a set regulation in place to specify avenues for cooperation, this process was sometimes cumbersome.

BOX 2. COTEMU

One intended outcome of the Multipropósito is the creation of an operational technical commission, called the COTEMU (Comisión Técnica de la operación del Proyecto Multipropósito, or Technical Commission for the Operation of the Multi-Purpose Project). The COTEMU will manage the distribution of water for drinking, sanitation, and irrigation from the infrastructure that was created for the project. As this requires the creation of a legal framework to sustain and regulate the competencies of this commission, it is an opportunity to include regulations that enable cooperation between the government agencies and COTEMU, and to establish regulations regarding the compensation for water rights in similar projects.³⁶ However, despite ongoing efforts by EMAGUA, the COTEMU has not yet been formally established. This is partly due to difficulties in coordinating among a wide range of actors at different levels, as well as ongoing efforts to build trust among these jurisdictions.

4.3.1. Building Trust and Delivering on Agreements

Over time, the Multipropósito adopted strategies to address social issues and build trust with communities, including through delivering specific benefits requested by the communities. One such strategy aimed to leverage the many small-scale social projects enabled by Component III to deliver tangible benefits, thereby demonstrating the overall trustworthiness of the Multipropósito. These projects were among the first to demonstrate such tangible benefits, and were developed jointly with community members, enabling projects to be tailored to address the unique needs of each community. This customized approach was possible due to the flexibility of Component III, which could fund a wide range of activities to strengthen communities' resilience and preparedness, within the parameters of promoting watershed and land management as set out in municipal watershed management plans. Stakeholders highlighted this attribute as very useful, making Component III a key support (palanca) for the project as a whole.

The process of individual, piecemeal negotiations with each community, without a preestablished "offer" of what was available and possible to deliver, meant that the outputs of the third component varied widely. Initiatives and agreements with a community were planned and implemented depending on the identified needs and wishes of the community and in line with municipal watershed management plansan approach that helped to establish community ownership of the outputs. Stakeholders indicated that these community-level initiatives helped demonstrate engagement, trustworthiness, and long-term benefits of economic transformation in the project area. For example, the provision of livestock shelters was an important contribution, given that many people in the area keep native camelids (i.e., llamas and alpacas), sheep, and cattle as sources of wool, milk, and meat.³⁷ Trainings were also delivered on various economic activities, from the production of baked goods to marketing handicrafts, as well as on sustainable land, soil, and water management. These trainings helped to embed within communities the importance of working across multiple areas to build resilience.

Another activity incorporated reforestation projects using native plants, which helped to revitalize local nurseries that were run by local associations. The nurseries grew a variety of native herbs, shrubs, grasses, and trees, which could be sold to contractors and other buyers and planted in areas with ongoing infrastructure works. Nurseries also achieved synergies with other local enterprises and activities. For example, in one community, a nursery used blood from a local slaughterhouse as fertilizer for plants. This nursery project was identified as important for the project gaining acceptance in this area.³⁸



The combined impact of these activities, which were implemented under Component III, was crucial. Multiple stakeholders described how Component III activities enabled the advancement of other project areas, as the engagement under this component helped build trust by showing the tangible benefits delivered by the project.³⁹ Activities were also complemented by a robust communication strategy that ramped up as the project progressed. The strategy included brochures, mini-graphic novels, and a television documentary to further build knowledge and understanding about the project.

Benefits at local scale were also demonstrated by Component II, through the rehabilitation of irrigation canals and the installation of covered pipes to convey water. These works were complemented by technical support to improve irrigation practices, such as for terracing fields on steep hillsides that were not previously farmed, aspersion irrigation, and rainwater



harvesting systems. These innovations allowed for benefits such as the increased production of vegetables in household gardens.

The implementation schedule of the three components also mattered. Without the small-scale implementation actions of Components II and III, which were able to show tangible benefits to communities and help establish trust, other implementation actions could have been completely stopped or significantly delayed. In fact, the ability to move forward expeditiously with Component III was a vital enabler for the rest of the project, opening the "padlocks" of community opposition and unmet claims.

BOX 3. Engaging Women in Activities of the Multipropósito

The community outreach activities conducted under Component II and Component III actively involved women, fostering opportunity for participation in the project. Women in Bolivia participate in some social and political activities at lower rates than men, as social norms and domestic labor responsibilities pose important barriers to participation.⁴⁰ Men are often seen as the natural representatives of the family or the community when discussing development projects, and women have been noted to take a less active role than men in water governance.⁴¹ By engaging women directly, stakeholders explained that the project could socialize its activities among women, but also, indirectly, among their spouses and male relatives. When women of the communities became familiar at first hand with the benefits of the Multipropósito, some were willing to advocate for the project in their families and communities. Their disposition in favor of the project helped support, in some cases, the lifting of the candados and the continuity of projectrelated work.42

One modality that engaged women in entrepreneurial activities was the creation of "artisan houses" for the production and sale of handicrafts, such as handwoven and knit woolen textiles. The project also provided training in how to prepare such handicrafts, complementing existing knowledge with additional techniques.⁴³ Another activity that engaged women specifically and directly was an initiative called *Uma Mamas*, which in the Aymara language means "mothers of water." This initiative provided women with training in leadership, in monitoring water use, and in using irrigation systems and plumbing, and promoted women's participation and agency in water management.

4.3.2. The Role of Project Management in Addressing Delivery Challenges 1 and 2: Building Consensus and Enabling Coordination

Shifts in project management approaches to focus more intensively on social aspects were also a key enabling factor in the implementation of the Multipropósito. The role of the third project manager, beginning in 2019, was instrumental, as this manager brought extensive experience working in and negotiating with communities in development projects. Critically, the project manager spoke Aymara, the first language of many community members, and his constant presence in the communities, together with other implementing staff, allowed the project to show a human face and add to it a personalized dimension—which was vital for gaining community members' trust.

In interviews, this manager described lengthy processes of discussion with communities.⁴⁴ First. he said, one must give the floor to community members, showing them respect and listening to their concerns. Only when their perspectives have been fully presented is it appropriate for the project representative(s) to present their own. Moreover, he explained, a key aspect to negotiating with communities that have specific demands is to establish clear communication about the kinds of claims that can and cannot be considered. Thus, it is important for project staff members to not raise expectations of benefits beyond the scope of the project's authority, as this would risk creating greater disappointment among communities and endangering relationships of trust if expected benefits were not delivered.

The project manager's role also helped to support the role of municipal authorities, who were responsible for overseeing some of the infrastructure installed. Mayoral authorities described working closely with the project manager on community outreach, staying up past midnight at community meetings, listening and discussing. These authorities described this close working relationship with project management in a tone of solidarity, as key to enabling the progress of the project.⁴⁵ This working relationship was also bolstered by training delivered to municipal authorities and other stakeholders in negotiation techniques and conflict management, enhancing their existing experience and complementing existing social knowledge.

Another challenge that project management worked to address was communication and coordination with the contractor of the large infrastructure works. For example, while the contractor had considerable expertise in the implementation of drinking water projects, it had less experience with irrigation systems. These gaps in the contractor's technical knowledge on the irrigation component led to delays. which generated distrust among beneficiaries of the irrigation system. Moreover, the contractor lacked specific understanding of the social context of local communities, and direct interactions with community members sometimes generated additional friction. The project management took on the role of the mediator between the contractor and communities. with the goal of preventing tension.

Another key enabling factor for successful negotiations lay in the realm of information management. By 2019, a database platform was in place to monitor implementation of the Multipropósito. The platform incorporated mapping tools to visualize physical progress of works and included updates on progress of disbursements and infrastructure construction, records of agreements between different levels of government, and, crucially, a database of agreements with communities. Up to this point, there had not been a central database to easily monitor progress and agreements. Consequently, it had been difficult to track that the conditions of the agreements were being met. Having a more easily accessible record of what agreements had been reached, and if agreements were being complied with, was a significant enabling factor for successful negotiations. Multiple stakeholders highlighted the introduction of this platform as a crucial turning point in enabling effective management of the program.



BOX 4. Experiences of Two Dams

A key aspect of the Multipropósito was to increase the capacity of dams at two mountain lakes: Taypichaka, which sits in the Khullu Cachi watershed, and Khotia Khota, which belongs to the Jacha Jahuira system. These dams existed prior to the project, which aimed to expand them to capture more rainwater and glacial runoff, thereby increasing water storage.

Initially, both projects faced community skepticism and were slowed by social opposition and mobilization, but dam works at Taypichaka proceeded with little interruption beginning in 2019. The dam at Khotia Khota, however, made little progress between 2019 and 2023, with construction restarting in late 2023. The divergent paths of these works shed light on the range of challenges that similar projects may encounter.

The challenges specific to Khotia Khota included contractors' inadvertent intrusion on an area of stones revered by local community members, leading to community mobilization and demands for compensation. Following the resolution of this issue, another challenge arose related to compensation for a community member whose lands would be affected by the expansion of the dam and its associated lagoon. In this case, the initial compensation that was identified was not feasible as a payment, meaning that compensation had to be negotiated yet again. During this time, which spanned approximately three to four years, work on the dam was "paralyzed."⁴⁶

In contrast, construction at the Taypichaka dam proceeded with fewer interruptions. Directly downstream from Taypichaka lies a large bofedal, or cushion bog, an ecosystem vital to the watershed. Bofedales provide natural filtration and help absorb runoff in the watersheds of the altiplano. Because of the importance of this ecosystem, the project carried out extensive studies to ensure that it would not be negatively affected. Moreover, a small number of households near the lake had to be relocated and received compensation. In the absence of the risks that hindered its counterpart at Khotia Khota, the Taypichaka dam works progressed more smoothly.



4.4. Addressing Delivery Challenge 3: Information Baselines and Technical Capacity

The project faced gaps in information that hindered the construction of accurate climate models. Shortfalls in accurate and sufficient information on climate and water has presented a challenge in Bolivia for decades.⁴⁷ Moreover, given the methodological sophistication needed to generate and update models, some stakeholders in the IDB and in government found it difficult to commission additional analysis when needed.

4.4.1. Strengthening Capacity, Coordination, and Knowledge

These gaps would need to be addressed through innovative data-collection methods in collaboration with local academics, and through extended capacitybuilding exercises for municipal governments and EMAGUA. This technical capacity building, including for the operation of specific equipment, such as drones, was seen as critical for the project's longterm sustainability. Therefore, the project worked with researchers and academics in Bolivia to gather information and develop more accurate and up-todate models. It established a network of partnerships with universities and research centers to enable more robust and consistent data collection, which could, in turn, enhance project implementation while also contributing to long-term capacity building. The generated knowledge could inform updated models, helping to gauge project impact and inform resilience-building and preparedness efforts. For example, the project partnered with local academics, universities, and researchers to study local glaciers, which are crucial to water supply. To successfully gather information, the team deployed a drone that helped capture measurements of the extent of the glaciers. Researchers also installed metal barrels with sensors close to the glaciers, an innovation for remote glacial valleys in which it would be difficult to maintain and safeguard more delicate and expensive equipment.

Complementing these efforts to build knowledge and capacity, the Multipropósito invested in an environmental education outreach program for school-age children. This program was implemented in schools around the project area, with the aim of teaching children about the unique tropical glaciers, some of which they can see from their schoolyards thereby promoting a culture of water preservation, and environmental conservation more generally.

The project also invested in setting up the COTEMU as a coordinating body that could ensure project sustainability. However, this proved a slow and difficult process. By 2024, the COTEMU was not yet fully functioning, but efforts to constitute it continued (see box 2).

5. RESULTS

While the Multipropósito faced challenges and delays across the project's lifespan, progress steadily ramped up over time. By April 2024, approximately 82 percent of the total infrastructure works had been completed, including 51 percent progress toward completion on the Taypichaka dam. Moreover, with the restarting of work on the Kotia Khota dam in 2023. the dam had reached 17 percent progress toward completion. Improved drinking water systems had been set up in 13 communities that lacked these systems prior to the project, and irrigation systems were largely in place. Of the water pipes that would carry water to the treatment plant in El Alto, 42 kilometers (km) had been laid down, and only 6 km remained incomplete due to ongoing negotiations with the communities through which they would pass. Over 550 women had been trained in a variety of activities, including income generation, as well as water management under the Uma Mamas (i.e., Mothers of Water) program.

To conclude the project in a sustainable manner, the IDB and its partners needed more time to wrap up operations and evaluate results, finalizing the construction of ongoing works and monitoring at least one full hydrological cycle to assess the capacity of the dams at Taypichaka and Kotia Khota. Also, more time was needed to make more progress in setting up the COTEMU to ensure institutional continuity. The project requested an extension in April 2024, and Components I and II were extended to August 2025, while Component III was extended to December 2024.⁴⁸

The many smaller projects that can be observed across the municipalities of Batallas and Pucarani provide another lens on the project's impact—one in which a web of small-scale activities helps to support rural economies and livelihoods. Implementers described ambitious plans to further fortify these



agricultural economies. In a nursery, members of the association that was formed to oversee plantings mentioned ongoing plans to scale up. More potential productive activities were under discussion, including starting a milk cooperative, and leveraging newly irrigated fields to grow winter garlic and onions key ingredients in local cuisine that are currently imported from Peru.

Rural communities are also seeing qualitative improvements in certain markers of improved livelihoods. Some stakeholders asserted that some rural communities were gaining population, with more young people and adolescents in schools that previously had few pupils enrolled.⁴⁹ Intertwining water security and local economic activity, in other words, presented a sense of possibility and hope for communities.

6. CONCLUSIONS AND LESSONS

The experience of the Multipropósito has generated lessons about addressing implementation challenges in complex social contexts, characterized by a high level of social contestation and institutional gaps. These delivery challenges required significant time for project implementation, due to complex coordination with many institutions, (re)negotiation of agreements with communities, and frequent adjustments to establish and maintain trust. This situation is an example of the kinds of challenges confronted by many projects in countries that are disproportionately affected by extreme weather events (including many across the PPCR portfolio). As one stakeholder noted, recounting several years of experience with the Multipropósito, "This project has been a school" (una escuela).⁵⁰

LESSON 1: Investing in communication and socialization is crucial to enable implementation in a socially complex project.

Communication is essential in programs with many stakeholders, especially when one or more parties hold the power to halt or delay the execution of implementation activities. To foster support for the program's implementation among beneficiaries, it is important that all stakeholders are informed on its objectives and benefits from the beginning. This can facilitate smoother progress in carrying out implementation activities. However, socialization often requires significant time, particularly in contexts with historical legacies of distrust among stakeholders. Implementers should be aware of this challenge and plan accordingly. Overall, investing in effective, persuasive, and mutual communication that can help implementers and project participants/beneficiaries reach agreement and consensus pays dividends.



LESSON 2: Implementing robust mechanisms for interministerial coordination is key to projects that require inputs from many ministries or governmental agencies.

The Multipropósito involved a wide range of governmental actors, many of whom were only occasionally engaged in the project to help resolve requests for compensation. The degree and the timing of their involvement depended on many factors. Some stakeholders felt that a more formal platform for interministerial coordination would have provided a faster, more coordinated, and more efficient response, which could help to consolidate requests and claims from communities and coordinate budgetary measures. In the future, the COTEMU could play this role. However, while the COTEMU is being institutionalized, many coordination measures use relatively informal mechanisms, which can slow down the processes of responding to particular demands.

LESSON 3: In programs with a high degree of technical and social complexity, the role of the contractor is critical, and should be carefully managed.

The role of the contractor that implemented the infrastructure was critical, and, at times, technical and social challenges arose from the technical and social management capacity of this actor. In the early stages of the implementation, communication between the communities and the contractor was direct. without intermediaries. Also, language barriers were exacerbated by misunderstandings and disagreements about how to overcome implementation challenges. This led to the observation from some stakeholders. that if a contractor does not have an accurate and nuanced understanding of the local context in which they operate, they should not engage directly with communities. Moreover, stakeholders highlighted that contractors implementing such projects may benefit from strong social and technical support. This can also be informed by feedback received during the project from communities and communicated to the project management. The continuous collection of this feedback can also serve to inform project management, enabling managers to refine the mechanisms of communication and adjust implementation actions as needed.

LESSON 4: Multi-component projects should be carefully structured to ensure that components support one another effectively.

The Multipropósito has a complex design with multiple components, which was essential for implementation in a socially complex context, where diverse stakeholders need to achieve consensus about long-term challenges. All three components were necessary for the project's success in its broad objectives. Nearly all stakeholders mentioned the critical role of Component III in enabling organizational strengthening and implementing small-scale, community-focused projects that helped build trust with the communities. Ultimately, the Multipropósito's social dimension was indispensable for the success of its engineering aspects.

LESSON 5: Adaptive project management enabled increased attention to social factors and played a critical role in driving project successes.

At the beginning of the Multipropósito implementation, the project faced significant constraints related to issues of trust between the communities and the project, as its benefits were not clearly perceived and water basin management activities had not yet started. Moreover, project management turnover impeded efforts to build trust with communities. This situation improved with the appointment of the third project manager, who served as an effective link for all stakeholders and communicated with the communities in Aymara, facilitating communication and signaling goodwill. It is important to have project managers and personnel who can be the face of the project by undertaking problem-solving in real time and encouraging project participants to engage. This model, however, entails a great deal of time commitment from a project manager, who in this case spent his days driving from one community to another, attending meetings and discussions to promote the project, delivering social benefits, listening to concerns, and resolving disagreements—always troubleshooting and keeping up with the pulse of the project.

This speaks to a final point: a project about piping, valves, canals, and a range of other infrastructure has ultimately been shaped more by social dynamics than by engineering challenges. In projects where social dynamics and the need to balance a wide range of human and environmental needs, interests, and priorities prevail, a socially driven approach that emphasizes dialogue and engagement is crucial to enable all stakeholders to move fairly toward a sustainable future that benefits both people and the environment.

ENDNOTES

CLICK ON ANY NOTE TO GO BACK TO THE REFERENCED PAGE

- → 1 In Bolivia, departments are a main subnational unit of territory, analogous to a state or province.
- → 2 See CIF, 2023, "Supporting Just Transitions to a Sustainable Water Sector in Bolivia," Just Transitions Case Study. <u>https://www.cif.org/resource-collections/just-transition/supporting-just-transitions-sustainable-water-sector-bolivia</u>.
- \rightarrow 3 Ibid.
- → 4 Stockholm Environment Institute, Water scarcity, climate change and Bolivia: Planning for climate uncertainties, (2013), <u>https://</u> www.sei.org/mediamanager/ documents/Publications/SEI-DiscussionBrief-Escobar-Spanish-BoliviaWaterClimate.pdf.
- → 5 CIF, 2023.
- → 6 See Perreault, T. 2008. "Custom and Contradiction: Rural Water Governance and the Politics of Usos y Costumbres in Bolivia's Irrigators' Movement." Annals of the Association of American Geographers 98 (4): 834–54. doi:10.1080/00045600802013502.
- → 7 See CIF, Strategic Program for Climate Resilience for Bolivia (SPCR), (2011), <u>https://www.cif.org/sites/cif_enc/files/ppcr_5_bolivia_spcr_0.pdf</u>.
- → 8 Interviews with stakeholders, April 2024; communication with stakeholders, September 2024.

- 9 See, for example, Building transformative institutional adaptive capacity: assessing potential contribution of PPCR to build a climate-resilient water governance framework in Bolivia, 2020, Simon Allen, Javier Gonzales Iwanciw, Lina Rodriguez, Markus Stoffel, Alfred Grünwaldt, Federico Brusa, and Maria Julia Bocco, Inter-American Development Bank.
- → 10 CIF, 2023.
- → 11 The term campesino can encompass multiple layers of meaning, and in many Latin American countries carries important connotations of identity, beyond mere economic activities. The identification of individuals or groups as campesinos can also overlap with, or be pitched in contrast with, Indigenous identities.
- → 12 Perreault, T., 2008.
- → 13 Based on projections from the population data analyzed 2001-2012. Source: INE. CPV 2001; CNPV. 2012.
- → 14 Interamerican Development Bank (IDB), 2014, "Operation Development Proposal. Multipurpose Drinking Water Supply and Irrigation Project for the Municipalities of Pucarani, Batallas, and El Alto."
- \rightarrow 15 Ibid.
- → 16 Stakeholders described changes in weather patterns, including in 2023, which saw extended drought followed by very heavy rains at the end of the year. See also discussions of awareness of changing weather patterns cited in SPCR (2013).

- → 17 These crops include staples, such as potatoes, as well as garden vegetables.
- → 18 Canedo Rosso, C. (2019). Addressing water scarcity in the Bolivian Altiplano for sustainable water management.
- → Water Resources Engineering, Lund University.
- → 19 Allen et al., 2020.
- \rightarrow 20 bid.
- → 21 CIF, 2023.
- → 22 IDB, 2014.
- → 23 This term refers to the nontechnical barriers that hindered the implementation process or threatened to impede it.
- → 24 See CIF, 2023. Perreault (2008) refers to the 1906 law as "little more than a legal anachronism."
- → 25 See articles 16 and 20, Constitución Política del Estado, Bolivia. <u>https://www.oas.org/dil/</u> esp/constitucion_bolivia.pdf.
- \rightarrow 26 Allen et al., 2020.
- → 27 Stakeholder communication, October 2024.
- \rightarrow 28 Interviews, March and April 2024.
- → 29 CIF, 2018, "CIF Evaluation Report: IV Forum – Workshop: Resilience and Adaptation to Climate Change," p. 35, <u>https://www.cif. org/sites/cif_enc/files/meetingdocuments/bolivia-2017_ppcr_ rr_-annex.pdf.</u>
- → 30 Interviews, April 2024. See also discussions of awareness of changing weather patterns cited in SPCR.

- → 31 Steven Collins, "How a High Risk Project in Bolivia Found a Pathway to Success and Sustainability," IDB Blog, 2016, <u>https://blogs.</u> iadb.org/sostenibilidad/en/howa-high-risk-project-in-boliviafound-a-pathway-to-success-andsustainability/.
- \rightarrow 32 In the discourse of abandonment that is often used in rural communities of the Andes. opportunities for engagement with the state are crucial to achieve access to development gains that are often seen as having been absent (for example, functioning improved water systems), and to gain recognition from the state. This perception is often articulated in Andean communities as a narrative of "abandonment" by the state. Yet this does not equate to a literal lack of state presence. Rather, it represents an attempt to establish a political discourse that makes demands of the state to provide more benefits, to live up to expectations, or to fulfill its end of a social compact-even framing these ties as quasifamilial in nature, as in the idiom of being "orphaned" by the state. See Mattias Borg Rasmussen, "Tactics of the governed: figures of abandonment in Andean Peru." Journal of Latin American Studies 49.2 (2017): 327-353.
- \rightarrow 33 Interviews, April 2024.
- \rightarrow 34 Interview, April 2024.
- → 35 Agencia Boliviana de Información, February 8, 2024, <u>https://abi.bo/index.php/</u> <u>sociedad2/47003-comunidades-</u> <u>exigen-demandas-que-rebasan-</u> <u>la-capacidad-economica-y-</u> <u>demoran-proyecto-de-agua-para-</u> <u>el-alto-batallas-y-pucarani.</u>
- → 36 CIF, 2023.
- → 37 Interview with IDB stakeholder, March 2024.
- → 38 Interview with municipal officials, April 2024.
- \rightarrow 39 Interviews, April 2024.
- → 40 World Bank (2015), Bolivia: Challenges and Constraints to Gender Equality and Women's Empowerment. Washington, DC: World Bank. See also CIF, 2023.
- → 41 See World Bank, 2015; CIF, 2023.
- → 42 Interviews with stakeholders, La Paz, April 2024.
- → 43 One stakeholder noted that many women in the altiplano communities weave or knit constantly, even while walking from place to place. By way of explanation, she pointed out a woman, dressed in the traditional skirt (i.e., the "pollera") worn by Aymara women, who was at that moment standing at a fork in the road, knitting a thick brown garment.

- → 44 Interviews, Project Manager and local officials, April 2024.
- → 45 Interview, local officials, April 2024.
- → 46 According to project documentation and interviews with stakeholders, April 2024.
- → 47 Personal communication, October 2024.
- → 48 Personal communication, August 2024.
- → 49 The described improvements in well-being depicted a complex process of change, with multiple motivations. For example, during the COVID-19 pandemic, people of working age left the cities for rural communities.
- \rightarrow 50 Interviews, April 2024.



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