



SUPPORTING JUST TRANSITIONS TO A SUSTAINABLE WATER SECTOR IN BOLIVIA

JUST TRANSITION CASE STUDY - MARCH 2023



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EXECUTIVE SUMMARY

Water is vital to Bolivia's national development and climate goals. Providing universal access to basic services, increasing food security, and decarbonizing the energy sector will all require significant water resources. Yet Bolivia is facing a water crisis, as it has limited water supplies, and demand keeps rising due to population growth and increased water use in agriculture, industry, and energy. The government plans to increase the share of hydropower in the electricity mix from 15 percent in 2019 to 70 percent by 2025 and increase irrigated land from about 520,000 hectares in 2020 to over 1 million by 2030. Plans to develop lithium mining may also require water for extraction and processing.

Meanwhile, climate change is further straining Bolivia's water supplies. In parts of the highlands, valleys, and El Chaco in southeastern Bolivia, water scarcity is a growing problem, as weather patterns are changing, droughts are more frequent, and glaciers are retreating. The lowlands in northeastern Bolivia, on the other hand, are increasingly prone to flooding.

Climate data show the Bolivian Andes are warming faster than the rest of the world, and models suggest the trend will continue and the glaciers will disappear, leaving the highlands without crucial sources of water. Water quality is also jeopardized by mining, deforestation, urbanization, and untreated wastewater.

Tackling these challenges requires broad and deep changes to achieve more sustainable and inclusive water resource management. Those changes could be very disruptive, so they need to be implemented carefully, and just transition planning is crucial to avoid negative impacts on individuals, communities, governments, and businesses. This is especially important given that a majority of the climate finance received by Bolivia is for adaptation, and the sector with the largest share of disbursements to date is water and sanitation.

Applying a just transition lens to sustainable water governance can provide important insights into how development, water, climate change mitigation,

and adaptation considerations can be integrated to overcome challenges and tap into opportunities. It is also a way to connect key concepts that have shaped water governance in Bolivia, including *buen vivir* (living well) and climate justice.

This case study, part of a series exploring how Climate Investment Funds (CIF) investments have contributed to—or interacted with—efforts to ensure just transitions, examines Bolivia’s water resource management challenge across three dimensions: 1) *social inclusion*, recognizing marginalized groups and engaging them in discussions and decision-making processes; 2) the *distributional impacts* of climate action, and whether the benefits and costs associated with transitions are allocated fairly; and 3) *transformational intent*—that is, the degree to which policies and measures transform the norms and structures that have created social and economic inequalities.

This study highlights significant conflicts and disparities in the current allocation of water that the transition will need to address. Many low-income households in urban peripheries and rural areas lack access to drinking water, many farmers cannot irrigate their crops, and water pollution is a serious problem. Furthermore, communities—especially marginalized and disadvantaged groups—have limited input in decisions about water resource management.

The case study then draws out lessons from CIF investments in Bolivia’s water sector, focusing on CIF-funded projects under the Pilot Program for Climate Resilience (PPCR). The projects examined in this study were not developed with an explicit focus on just transitions, so the analysis does not evaluate whether they achieved them. Instead, it applies a just transitions lens to learn from experience and inform future efforts by CIF and others to explicitly support just transitions in the water sector, in Bolivia and elsewhere.

The case study finds that water governance projects must engage with a broad range of stakeholders, but achieving sustained direct engagement can be challenging, and marginalized groups’ participation may vary. Water governance projects should incorporate local knowledge and strengthen local actors’ capacities, but they may encounter political challenges in negotiating water-sharing agreements among water users and defining future governance arrangements.

From a distributional equity perspective, the analysis shows that environmental and social safeguards are helpful to identify disadvantaged groups and target activities to them, but they have limitations. The complex political economy of water governance, including tensions between upstream and downstream water users, can also be a challenge. Access to high-quality hydrometeorological data and climate information is essential at all levels of government. Measuring distributional impacts is difficult, as standard project indicators are ill-suited to that purpose, and the impacts of governance outputs depend on implementation.

Looking at the extent to which water governance projects can contribute to transformational change, the analysis finds some of the greatest potential in subprojects tailored to the needs of marginalized groups. However, significant scaling-up would be needed to transform Bolivia’s water governance. In terms of changing norms and practices, the study shows that water governance projects can foster a strategic and integrated water management approach through the development of climate resilience guidelines and hydrometeorological information systems, but many challenges remain to operationalize integrated water management practices that are truly multisectoral and inclusive.

The study concludes with several recommendations for how to support just transitions in Bolivia and beyond:

- **Embrace an integrated, holistic approach to policy making across sectors and governance scales:** Increased coordination across sectors and scales would allow decision-makers to better tackle the structural drivers of water-related inequalities and balance trade-offs between water uses and users. CIF and multilateral development banks can support the establishment of multipurpose cross-sectoral governance arrangements and inclusive methodologies for elaborating water management plans.
- **Anticipate and address the distribution of risks, losses, and benefits of policies, projects, and investments:** Given how central this is to ensuring just transitions, it is important to incorporate robust procedures for assessing distributional effects upfront, with appropriate indicators for monitoring and evaluation during and after implementation. Existing safeguard policies and monitoring, evaluation, and learning frameworks can help, but they are not sufficient.
- **Identify and address fundamental inequalities and their drivers:** Internationally funded projects typically focus their equity efforts only on providing compensation to people affected by transition policies and projects. This fails to address underlying marginalization and vulnerabilities and may even exacerbate them. Projects should be designed with a clear understanding of the local political economy, including an analysis of the historical processes and institutional mechanisms of marginalization. This can serve as a foundation for more equitable, inclusive, and transformational benefit-sharing.
- **Build adaptive capacity through enhanced access to data and climate information:** Improving the quantity, quality, and transparency of hydrometeorological data and information systems, and making them more accessible, can help key institutions and communities make

better informed and more inclusive decisions that target the fair distribution of water resources.

- **Recognize and incorporate Indigenous and local knowledge:** Supporting just transitions requires recognizing and building on a broad range of knowledge sources, especially local communities and Indigenous Peoples. Drawing on local people's knowledge, interests, values, and aspirations is key for understanding just transition challenges and identifying appropriate responses. This requires moving beyond purely top-down approaches that tend to rely mainly on data and insights from experts and public officials.
- **Sustain stakeholder engagement, particularly by marginalized groups, through all stages of a project:** Stakeholders need to be able to participate meaningfully all along the project and policy processes, from framing the issues and priorities that need addressing, to policy and project design, to implementation, monitoring, and evaluation. Typically, engagement with marginalized groups is now limited to consultations at the start and during implementation of a project, and activities under safeguard policies. Encouraging a deeper and longer engagement with local communities, including beyond projects' typical time frame, has the potential to increase local ownership and the long-term sustainability of the projects.
- **Identify and tackle trade-offs between climate mitigation and adaptation measures:** A just transition requires a skillful assessment of the risks and opportunities for adaptation related to domestic and foreign mitigation strategies, to fairly distribute associated costs and benefits. This includes those associated with the anticipated increase in demand for minerals and other natural resources, including biofuels, which can put significant pressure on water systems as the low-carbon transition accelerates globally.



1. INTRODUCTION

Social and economic transformations are urgently needed to address climate change around the world, including major changes in how we use and govern natural resources. Careful management is needed, however, to avoid disproportionate impacts on vulnerable individuals and communities. Planning for just transitions has thus become a priority in climate action, to ensure that the resulting transformation is economically and socially fair and inclusive.

Just transitions research and policies to date have mainly focused on the shift away from fossil fuels. However, as the concept gains ground in the global South, it is increasingly recognized as highly relevant to climate change adaptation strategies, which can also have disparate impacts. A just transitions lens can help decision-makers understand how the benefits and burdens of those strategies will be distributed across society and over time, why, and how to achieve more equitable outcomes.

Some of the most significant impacts of climate change around the world will involve freshwater systems. The latest assessment by the Intergovernmental Panel on Climate Change (IPCC) projects an increase in the risks of large floods, a decrease in the availability of renewable water resources, and a reduction in raw water quality!¹ This situation is expected to intensify competition for water for different uses—agriculture, ecosystems, settlements, industry, and energy production—and thereby affect regional water, food, and energy security. It may also create tensions between countries over water governance.²

Bolivia is already facing a water crisis that threatens to leave millions of people without reliable supplies of safe drinking water, caused by the combined effects of glacial retreat in the Andes, droughts, growing demand for water, and governance challenges. New institutions, technologies, and strategies for water

governance are needed to address the crisis and enable sustainable and inclusive development. A just transition approach is crucial, as water access today is inequitable, and previous water-related transitions have not led to sustainable and inclusive outcomes.

This case study is part of a series by the Climate Investment Funds (CIF) exploring what it means to ensure just transitions as part of ambitious climate action.³ It starts from a recognition that there is no single definition of a just transition, nor a universally applicable blueprint for how to plan and implement one—the issues to address depend on the context. However, through in-depth case studies of activities financed by CIF in different places and sectors, the series provides insights for future efforts around the world.

This study focuses on the water sector in Bolivia, which has gone through significant changes over the past few decades. It explores how water governance—the political, social, economic, and administrative systems used to develop and manage water resources and deliver water services across sectors and locations—may hinder or enable just transitions. As climate change increasingly constrains water supplies in Bolivia, water governance will play a key role in determining how climate impacts, as well as the costs and benefits of climate action, are distributed across societies. The concept of just transitions has not yet received much attention in this sector, so this study addresses an important knowledge gap.

The analysis draws on insights from activities funded by CIF under the Pilot Program for Climate Resilience (PPCR), implemented in partnership with the International Bank for Reconstruction and Development (IBRD), which is part of the World Bank Group, and the Inter-American Development Bank (IDB). It is based on a review of project documents, reports, and peer-reviewed scientific studies, as well as interviews with stakeholders and experts involved in water governance in Bolivia and in these projects in particular.

The study follows a framework developed by the Just Transition Initiative that identifies two key concerns

that need to be addressed for a just transition: *social inclusion* (or procedural justice) and *distributional impacts* (both positive and negative), as well as a cross-cutting element: *intent*. As shown in Figure 1, depending on the intent, a range of actions may be taken to address social inclusion and distributional impacts, resulting in incremental reforms or transformative change.⁴

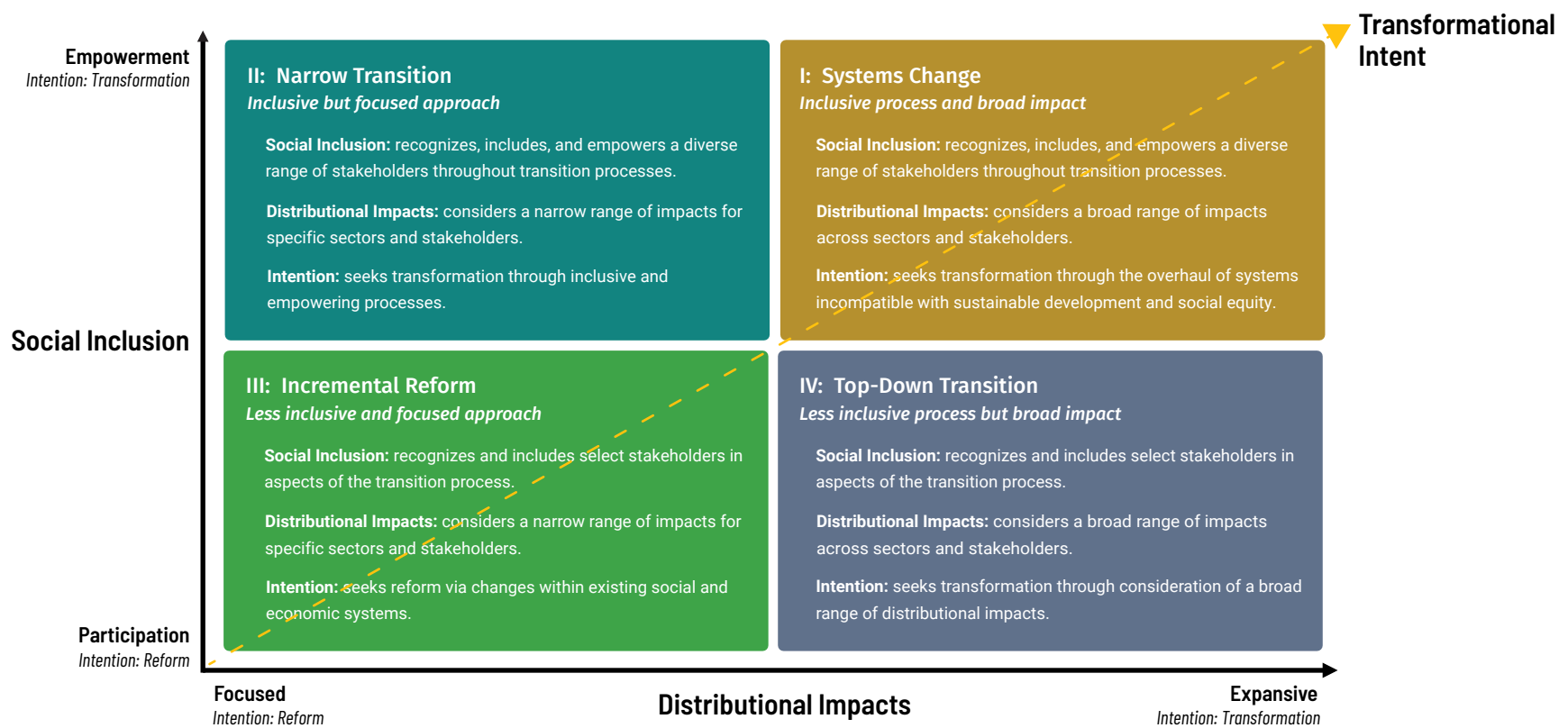
Social inclusion is important because the process through which a just transition is pursued should involve meaningful participation across society, including by those stakeholders who are most vulnerable or marginalized. An inclusive process is also likelier to be perceived as fair, and can thus create the buy-in and ownership needed to succeed. In fact, strong involvement by local communities can produce better outcomes, by ensuring that knowledge of the local context and culture and local visions for the future drive the transition.⁵ Recognition is an essential component of social inclusion—recognizing not only different groups and their concerns, but different customs and sources of knowledge. This is especially relevant in Bolivia, where reliable scaled-down scientific data on water and environmental issues are lacking, and traditional and Indigenous knowledge and approaches to decision-making and conflict resolution play important roles.

The **distribution of impacts and opportunities** is a central concern in a just transition. It is crucial to recognize how the both the costs (or harms) associated with economic, social, and environmental changes, and the new opportunities created, are distributed across society, and set up mechanisms to help distribute them fairly. It is particularly important to ensure that people who are already vulnerable are not harmed, and to provide them with appropriate support not only to help them get through the transition, but also to be able to reap the benefits.

Transformational intent is a key aspect of just transitions because creating just processes and achieving just outcomes often requires transforming the systems, norms, or structures that created social and economic inequalities—and often also environmental problems—in the first place.

In practice, many transitions proceed through incremental reforms, introducing technological or financial changes, but leaving the existing social and economic systems largely intact. More transformative approaches tackle systems, policies, and institutions that create or reinforce inequity, exclusion, or environmental harm.

Figure 1.
A FRAMEWORK FOR JUST TRANSITIONS



Applying this framework to the water sector in Bolivia, this study draws attention to key aspects of water governance that can enable just transitions, but pose challenges:

- Securing basic human rights, including the right to access sufficient potable water in both upstream and downstream areas;
- Implementing nature's water rights, as established under Bolivian law;
- National prioritization of water-intensive urban industrial activity, commercial irrigated agriculture, or extractive industries, for instance, over community needs;
- Ensuring that the water embedded in goods that enable global green economy transitions (such as lithium for batteries) is not prioritized over local access to clean water;

- Recognizing and including the people who are most vulnerable to changes in water governance practices in decision-making processes on water management;
- Moving beyond purely compensatory measures and addressing the underlying causes of communities' vulnerability.

The next section provides an overview of water- and climate change-related challenges in Bolivia, as well as the water management landscape. Section 3 then delves into the main just transition challenges in water governance in Bolivia. Section 4 describes CIF's work in Bolivia and the key components of the PPCR. Section 5 examines the distributional, social inclusion, and transformational implications of the PPCR in Bolivia. Section 6 draws out key insights from the case study and identifies opportunities for planning, supporting, and implementing just transitions, and Section 7 presents some closing reflections.





2. CONTEXT: WATER GOVERNANCE AND CLIMATE CHANGE IN BOLIVIA

Significant efforts have been made in the past two decades to expand access to water in Bolivia. They include new legal and institutional arrangements, recognizing traditional water management practices, strengthening public participation in water governance, and improving infrastructure. At the same time, climate change has increasingly strained water systems across the country. Adaptation efforts will need to go hand in hand with ongoing socio-political and institutional changes in the water sector, aiming to ensure social inclusion in water governance as well as a fair allocation of burdens and benefits.

2.1 CLIMATE CHANGE AND WATER CHALLENGES

Bolivia faces growing water challenges that threaten to leave millions without access to water. Population growth is driving an increase in water demand, while glacial retreat in the Andes and warming temperatures due to climate change, combined with worsening droughts, are severely limiting water supply. Water quality is further threatened by pollution from mining, deforestation, and untreated wastewater released into lakes and rivers.

As of 2020, 84.7 percent of Bolivia's population had access to improved water sources, while 62.5 percent had access to improved sanitation services.⁶ The government has made great strides in the past decade in enhancing water services, but coverage remains unequal, and people in rural areas and in low-income urban neighborhoods are disproportionately affected by water-related problems, including lack of access to basic services (see Section 3.3).

Climate change is exacerbating Bolivia's water challenges. Bolivia's mean annual temperature has risen by 0.1°C per decade since 1939, driving rapid glacial retreat.⁷ For example, about half of the surface area and two-thirds of the volume of the Chacaltaya glacier has disappeared since the mid-1990s. Climate models suggest that by mid-century, temperatures across the country could rise by another 1–2°C from 1995–2014 levels.⁸ This has serious implications for what remains of Bolivia's glaciers, which could vanish entirely within decades, and for the country's water supplies: runoff from glaciers provides an estimated 12–40 percent of the potable water for La Paz, for instance.⁹

Climate change is also affecting precipitation patterns, bringing more heavy downpours during the rainy season and, with them, more frequent and severe flooding, especially in the lowlands in northeastern Bolivia.¹⁰ By 2030, the Government estimates that 24 percent of the country could be affected by frequent floods, even as 27 percent of the country is affected by persistent droughts.¹¹ The disaster risk analysis tool ThinkHazard! describes Bolivia as being at high risk of droughts, expected to occur, on average, every five years, with by far the greatest drought risks in the Andes. Bolivia is also considered to be at high risk of potentially damaging and life-threatening river floods, urban floods, and landslides.¹²

At the same time, droughts are becoming more common and severe, leading to more water crises. In 2016, Bolivia suffered its worst drought in 25 years. It affected 125,000 families and led to a state of emergency.¹³ While the extreme rainfall linked to seasonal flooding is intensifying in the lowlands, a slight decline in Bolivia's total rainfall has been observed, and an increase in droughts is expected, further exacerbating water stress as the runoff from Andean glaciers declines.¹⁴

In addition to drought, water supply and quality is also affected by environmental degradation in water ecosystems, especially in Bolivia's high-elevation wetlands, *bofedales*, which play a key role in water supply. Overgrazing, urbanization, construction of dams, and groundwater extractions for mining have all contributed to a decline in the health of *bofedales*.¹⁵

Even as Bolivia's water supplies dwindle, however, demand is increasing, partly due to urban expansion. Climate change plays a role here, too: Though poverty and the pursuit of economic, education, and health opportunities are the main drivers of rural–urban migration, rural livelihoods and infrastructure are also being affected by climate change and environmental degradation, and this influences people's decision to move to the cities.¹⁶

Overall, water demand in Bolivia is expected to be 15–36 percent higher in 2036 than it was in 2011.¹⁷ Already, in some parts of the country, it exceeds

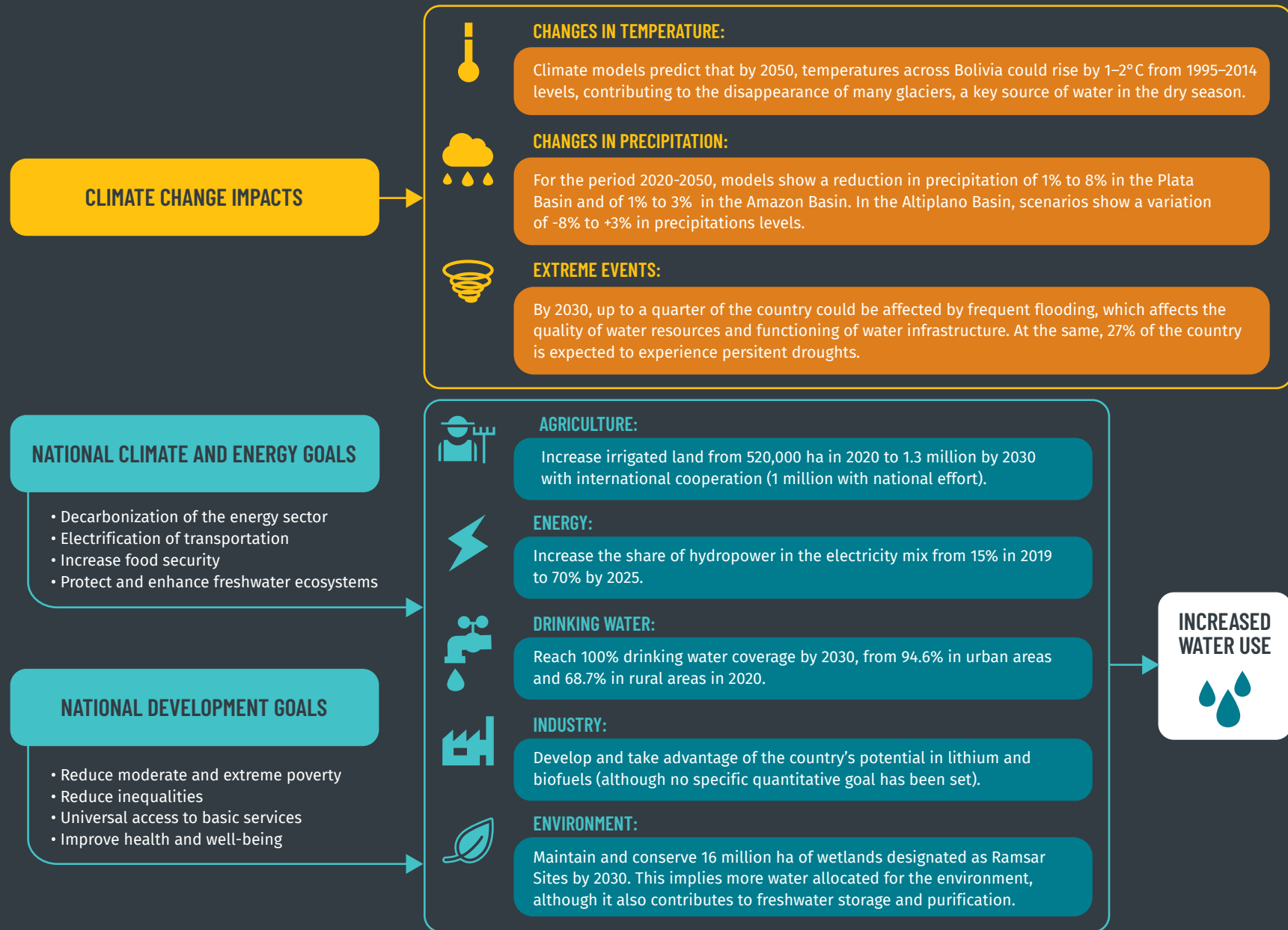
supply. In El Alto, demand first surpassed supply in 2009, and the gap is expected to grow, as the city's population is projected to at least double by 2050, to 2 to 2.5 million people.¹⁸ Per capita water use is also projected to rise: from 52 liters per person per day in 2013, to 77 liters by 2050, due to increased access to sanitation services.¹⁹

Agriculture and industrial activities are further increasing water demand. Agriculture in Bolivia uses about 4.48 million hectares of land²⁰ and accounts for 92 percent of freshwater withdrawals.²¹ Some of the top crops, such as soy and sugarcane, use large amounts of water. Development plans for the country include more than doubling the land under irrigation, which would require large quantities of water.²² Water is also allocated to industry and mines, which not only use significant amounts, but often contaminate water supplies.

Water is central to Bolivia's energy systems as well. As of 2019, Bolivia had 725 MW of installed hydropower capacity, but the National Electricity Plan 2025 aims to significantly increase the share of hydro, from 29 percent to 70 percent of the electricity mix, replacing natural gas.²³ Two planned hydropower projects, El Río Grande and El Bala, would increase capacity by an estimated 6,600 MW. As sectoral use of water continues to grow, there will be an increasing risk that water demand will exceed supply, making Bolivia more vulnerable to severe episodes of water crisis. In this context, an action that supports climate change mitigation, by replacing gas with hydro, could thus undermine climate resilience.

In short, while climate change is expected to affect water supply, development needs and climate action put additional pressures on the demand side. Bolivia's updated Nationally Determined Contribution (NDC) provides some indication of the expected increase in sectoral water use resulting from climate action in Bolivia and elsewhere (see Figure 2).²⁴ The scale is considerable, even when considering improvements in water use efficiency.

Figure 2.
CLIMATE-RELATED PRESSURES ON BOLIVIA'S WATER SYSTEMS



Note: the climate, energy and development goals featured have significant implications for the water sector. They are not a comprehensive summary of Bolivia's goals.

Source: Authors' own work, with climate projections from the World Bank's Climate Change Knowledge Portal.

Water scarcity in Bolivia already takes a significant toll. It has led to low agricultural productivity, food insecurity, and negative health impacts. The severe water droughts in 2016 affected 283,000 hectares of cropland,²⁵ affecting farmers' livelihoods and the supplies of food and animal feed. Due to persistent water scarcity, residents of the Huanuni Valley consume less than half the minimum water intake recommended by the World Health Organization (WHO), and they also endure low agricultural production and high levels of poverty and human and animal illness.²⁶ The droughts in the Bolivian Altiplano have been associated with a broad range of socioeconomic impacts, including hunger and malnutrition, migration, and local conflicts.²⁷ Climate change is also shifting seasonal patterns that communities have long followed to make decisions about when to plant and harvest crops, where to graze their livestock, and other key livelihood activities.²⁸ Households experiencing water insecurity, especially those led by women, have also been found to experience emotional distress.²⁹ As Bolivia becomes increasingly vulnerable to water crises, all these negative impacts may worsen in both intensity and frequency.

2.2 WATER GOVERNANCE IN BOLIVIA

Bolivians have a strong history of demanding rights to water and natural resources. This activism was especially prevalent in the 1990s and early 2000s, culminating in the “Water Wars” of 2000—a series of demonstrations sparked by water rate hikes after the privatization of Cochabamba’s water supply company.³⁰ The Water Wars were marked by a wave of large protests and unrest, followed by police violence and a state of emergency. Many protesters viewed the demonstrations not just as a fight against high water rates, but also as a fight by “the people” against foreign-led corporate globalization.³¹ Ultimately, the government reversed its decision to privatize the water utility. The social movements that arose in that period, which brought together urban workers, farmers, Indigenous groups, students, and others, led to significant changes in Bolivia’s legal and institutional water framework.

A new law on drinking water approved in 2000 (Law 2066) recognized disadvantaged communities as legitimate water users and exempted Indigenous Peoples, farming communities, and farming associations that follow customary practices (*usos y costumbres*; see below) from the water use fees paid by other consumers and by activities such as mining and industry.³² Similarly, a law on irrigation approved in 2004 (Law 2878) introduced a distinction between Indigenous and farmers’ organizations, which do not pay water fees, and agroindustry, cattle farmers, and forestry enterprises, which have to pay.

The recognition of traditional local water management practices is also noteworthy. Indigenous communities in the Andean highlands have unique customary laws and norms related to water,³³ including a belief that water and other resources are not owned by individuals, and that animals have rights to water as well.³⁴ Bolivia’s water laws recognize these customary rights in terms of access to water, rather than water “ownership” rights.³⁵

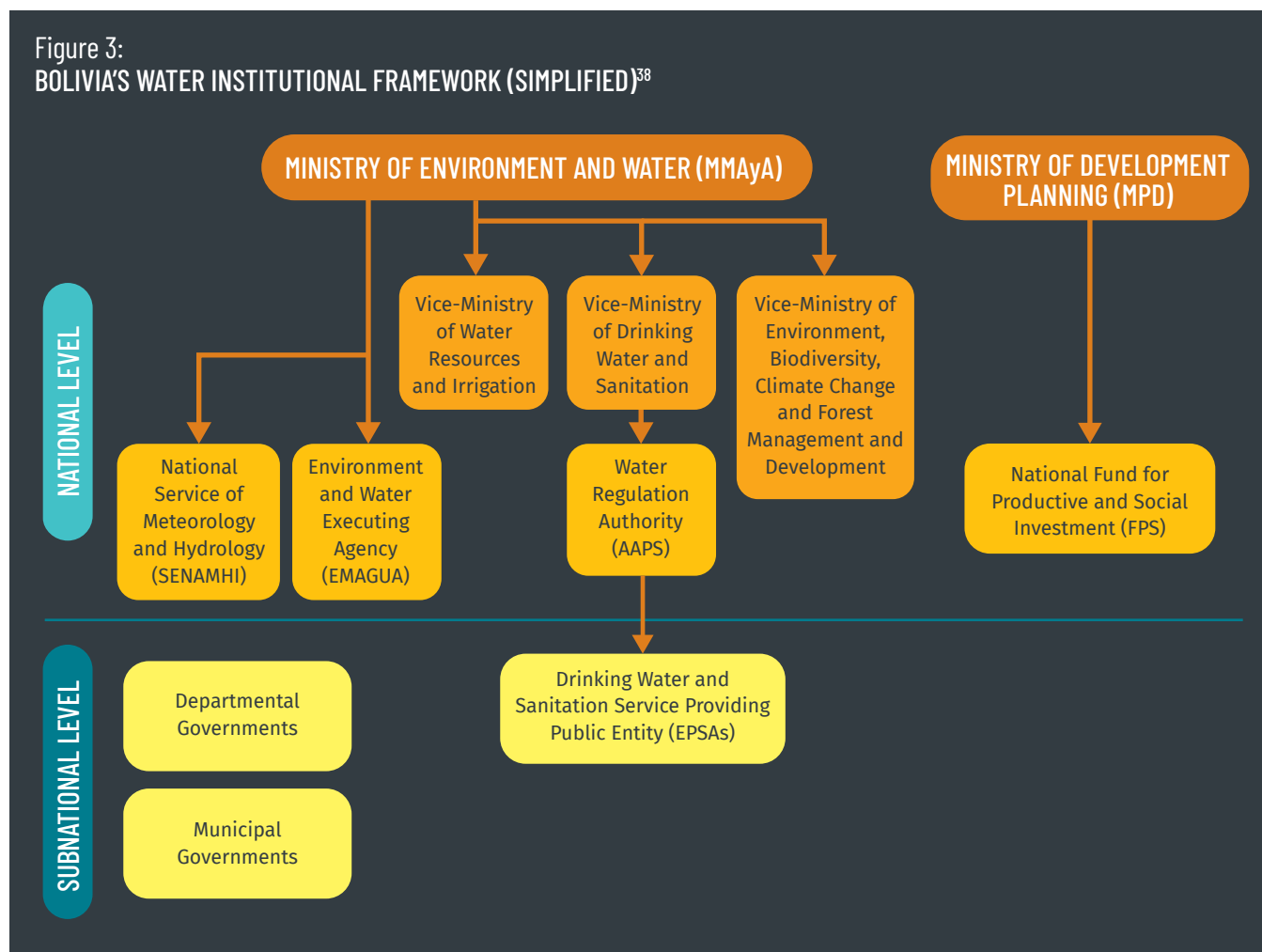
The changes in Bolivia’s laws were accompanied by changes in the institutional framework (see Figure 3), with the creation of the Ministry for Water in 2006, which became the Ministry of Environment and Water (MMAyA) in 2009. Bolivia also continued to decentralize its government—a process that had started in the 1990s and resulted in the Constitution of 2009, which introduced autonomous regimes for departments, regions, municipalities, and Indigenous Native Peasant Communities.³⁶ As a result, public competences related to water management are now spread across different governance levels (see Figure 3). This decentralization process also led to a new composition of public investments, with local governments prioritizing water, sanitation, and education over energy, fossil fuel production, and transport, which has historically dominated the central government’s investment approach.³⁷

The MMAyA, which is responsible for water policy at the national level, includes three vice-ministries: Drinking Water and Basic Sanitation; Water Resources and Irrigation; and Environment, Biodiversity, Climate Change, and Forest Management and Development.

The Ministry also oversees the National Service of Meteorology and Hydrology (SENAMHI). Other key national institutions in the water sector are the Water Regulatory Authority (AAPS), the regulating entity, and the Environment and Water Executing Agency (EMAGUA), an autonomous public institution responsible for executing, monitoring, and evaluating water and sanitation projects. At the regional

level, the governments of the departments—the largest subnational units—are responsible for water management and conservation, including integrated water resources management, discussed further below. At the local level, water management is the responsibility of municipalities, which operate directly or through a Drinking Water and Sanitation Service Providing Public Entity (EPSA).

Figure 3:
BOLIVIA'S WATER INSTITUTIONAL FRAMEWORK (SIMPLIFIED)³⁸



Water policy follows goals and guidelines established in key national policy documents. For instance, the Economic and Social Development Plan (2021–2025) seeks to “strengthen the integrated management of both surface and underground water resources to achieve water security,” including through structural and non-structural measures that increase climate resilience in watersheds.³⁹ The Plurinational Plan of Water Resources (2021–2025) established three sectoral policies to achieve water sustainability, understood as a) efficient, effective, and participative water governance, b) knowledge, science, and technology management for water, and c) productive, resilient, and environmentally sustainable investments with a watershed focus.⁴⁰ Bolivia’s NDC also includes water-related goals by 2030, such as—with international cooperation—achieving 100 percent drinking water coverage with resilient service delivery systems; more than doubling the coverage of efficient irrigation systems from 2020 levels, to 1.3 million hectares; increasing water storage capacity to 1.4 billion cubic meters (m³), and expanding hydraulic control infrastructure to 900,000 kilometers to reduce vulnerability.⁴¹ The NDC also includes goals related to integrated watershed management and the environmental functions of water, as well as for increased renewable energy use (to reaching 36.75 percent hydropower by 2030 in the country’s installed power generation capacity).

2.2.1 INTEGRATED WATER RESOURCE MANAGEMENT IN BOLIVIA

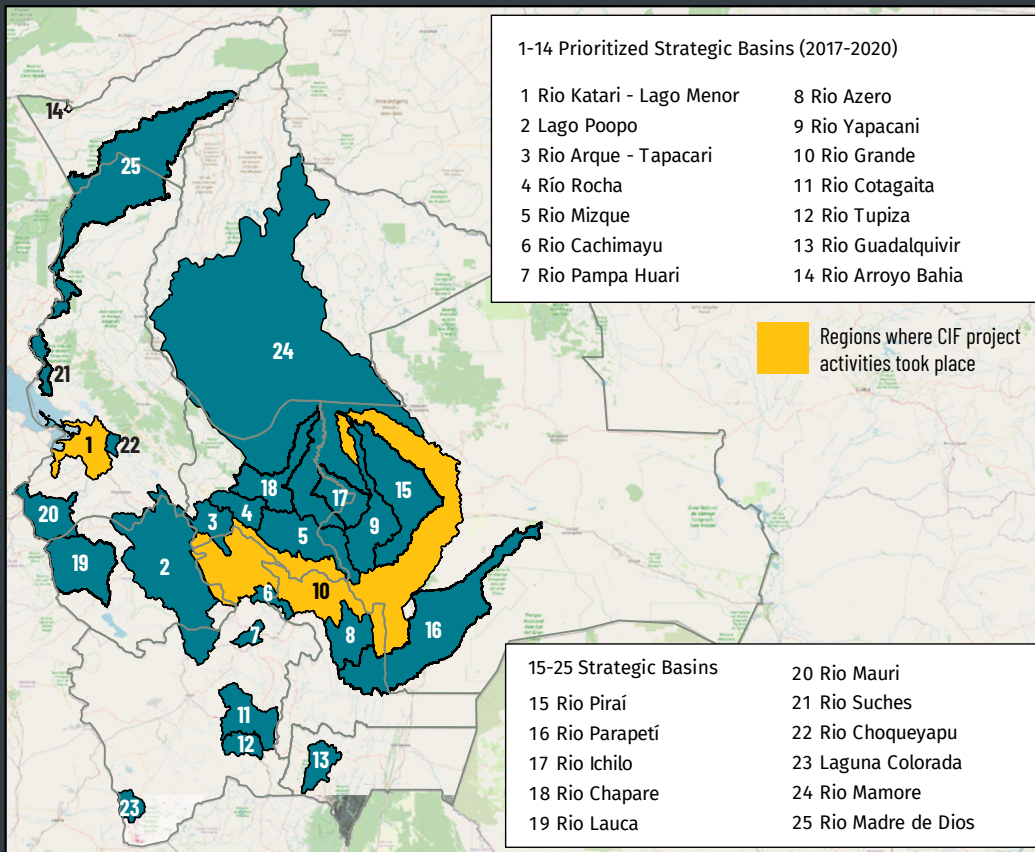
As the new governance framework was taking shape, the Bolivian government also adopted integrated water resource management (IWRM), a widely used approach to decision-making that promotes the coordinated development and management of water, land, and related resources across entire watersheds or river basins. Along with establishing water policies and laws at those scales, IWRM implementation typically includes the definition of water rights, water allocation, and pricing, as well as stakeholder participation in decision-making processes.⁴² Bolivia adapted IWRM to its national context, aiming to overcome conflicts over water by working at the river basin level.⁴³

Bolivia also adopted a complementary approach, integrated river basin management (IRBM), which focuses on the sustainable use of land and other natural resources in a watershed. IRBM typically focuses on more technical activities such as soil conservation, forest conservation, afforestation and reforestation, flood control, and civil infrastructure construction, while IWRM prioritizes social and institutional aspects of water management.⁴⁴ Under the prevailing policy framework, both IWRM and IRBM are considered key elements for reaching water security. As discussed in Section 4, CIF projects have adopted this dual approach in their design, which enables them to cover both the socioeconomic dimensions and natural resource conditions in a river basin.

The MMAyA developed national policies on IWRM and IRBM through the National Basins Plan (PNC), published in 2006. The PNC calls for addressing water challenges through interventions based on Watershed Master Plans (PDCs)—new instruments for coordination and articulation across government levels and sectors to develop water resource governance.⁴⁵ To implement this instrument, the MMAyA has prioritized 14 strategic basins⁴⁶ (see Figure 4). CIF projects included activities focusing on the Katari and Rio Grande river basins. This Plan has been updated on three occasions, for the 2013–2017 and 2017–2020 periods, and most recently for the 2021–2025 period (Plurinational Plan for Water Resources).



Figure 4.
WATERSHEDS PRIORITIZED IN THE NATIONAL BASINS PLAN FOR DEVELOPMENT OF WATERSHED PLANS⁴⁷





3. JUST TRANSITIONS, CLIMATE CHANGE ADAPTATION, AND WATER GOVERNANCE

3.1 JUST TRANSITIONS AND ADAPTATION

The concept of a “just transition” originated in the U.S. labor movement in the 1980s, as a way to highlight the need for workers’ needs and other social issues to be taken into account in addressing environmental concerns.⁴⁸ Over time, it was also adopted in broader environmental justice advocacy. In the past decade, especially after its inclusion in the preamble of the Paris Agreement, the concept has gained prominence as a way to highlight the equity dimensions of the transition away from high-carbon energy and industrial activities.⁴⁹ There are multiple interpretations of the term—in part reflecting different views about the need for fundamental changes in existing social and economic systems—but all emphasize that large socioeconomic shifts in response to climate change should be planned and implemented with careful consideration of equity, and allocate costs and benefits fairly.

Although the concept of just transitions was first applied to decarbonization efforts, it has gradually gained ground in discussions of equity issues around climate change adaptation.⁵⁰ Adaptation can also require deep and large-scale changes in infrastructure, production and consumption patterns, and resource management. Moreover, choices about whether and how to adapt create benefits and burdens that are distributed unequally across society and at different scales.⁵¹

The issue of social equity in climate adaptation has received considerable attention.⁵² Research shows that adaptation measures can reinforce vulnerability, redistribute it, and/or introduce new sources of vulnerability.⁵³ The policy and academic literature points not only to the outcomes of adaptation choices, but also to the decision-making processes themselves,⁵⁴ highlighting the need for procedural justice. For example, adaptation action is prone to elite capture, whereby the goals and priorities for adaptation are often set by relatively privileged

groups, resulting in the benefits of projects being mostly enjoyed by elites.⁵⁵ This has led to calls for redistribute or create new sources of vulnerability. Four mechanisms drive these maladaptive outcomes: (i) adaptation to go beyond avoiding or reducing harm, to transform systems so as to address the underlying causes of vulnerability, including poverty and inequality. As with mitigation measures, fairness is also seen as a key factor in the effectiveness of adaptation measures.⁵⁶

The same is true of adopting more sustainable water governance, a central aspect of adaptation in Bolivia and many countries. The transition will generate benefits (such as expanded access to water and resilience to climate change), as well as burdens (such as the obligation to share scarce water resources, which may require reduced consumption and the adoption of water conservation practices). The distribution of those benefits and burdens across society, between regions, and over time will determine how fair the transition is, with implications for its social and political feasibility. Past water transitions around the world, such as the privatization of water systems, have not always led to sustainable and inclusive outcomes.⁵⁷ Given the existing inequalities and sociopolitical tensions associated with water in Bolivia, as seen in the Water Wars (see Section 2.2), it is crucial that going forward, efforts to strengthen water governance in response to climate change are planned and implemented fairly and inclusively.



3.2 SOCIAL EQUITY AND JUSTICE ISSUES IN BOLIVIA'S WATER GOVERNANCE

The concept of just transitions has only recently started to be used in the Bolivian context,⁵⁸ but social equity and justice issues have been at the core of climate policy development in Bolivia. They have also been central to Bolivia's positions in international climate negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). Key concepts here are climate justice and *buen vivir* or *vivir bien* (living well).

The concept of climate justice has its roots in climate activism,⁵⁹ in recognition of the uneven distribution of the adverse impacts of climate change, with the people and countries that are least responsible for greenhouse gas emissions often suffering the most.⁶⁰ The climate justice approach also emphasizes that the climate crisis has resulted from the failures of an economic and political system that is fundamentally unjust,⁶¹ and calls for countries that have contributed most to emissions historically, and elites in both developed and developing countries, to reduce their emissions drastically. Social movements are promoting new forms of governance that emphasize place-based, environmentally sustainable approaches to resource management.⁶²

The idea of "living well" is closely linked to climate justice. It is rooted in Indigenous conceptions of the world and emphasizes the need to live differently, in harmony with Mother Earth, in "radical opposition to the neo-liberal consumerist, growth-without-limits paradigm, which for many years has promoted the exploitation of natural resources and of vulnerable people."⁶³ The concept originates from the term *suma qamaña* from the language of the Aymara, an Indigenous people from the Andean highlands of Bolivia, but other Indigenous groups throughout Latin America have similar concepts. *Buen vivir* rejects conventional Western ideas of development and progress that commodify nature and bring uneven economic benefits.

Many social movements in Bolivia, including during the Water Wars, have applied the concept in their

advocacy around resource management and climate policy.⁶⁴ The Constitution of 2009 commits to the protection of nature in the country, establishes *buen vivir* as one of its ethical and structural principles, enshrines the principles of multiculturalism and pluri-ethnicity, and recognizes and protects Indigenous rights, as well as some third-generation human rights, including the right to water.⁶⁵ These concepts were further embedded in Bolivia's institutional and legal framework through the 2010 Law of the Rights of Mother Earth, which recognizes nature as having rights of its own, and through the 2012 Framework Law of Mother Earth and Integral Development for Living Well, which reaffirms the rights of Indigenous Peoples and of nature. The latter also recognizes that all Bolivians should benefit equally from Mother Earth's resources, including water.⁶⁶ While this concept has been incorporated in policies and laws, its practical implementation has remained a challenge.⁶⁷

The 2012 Framework Law establishes IWRM as the main approach for water management in Bolivia,⁶⁸ following the principles of solidarity, complementarity, reciprocity, equity, diversity, and sustainability.⁶⁹ This is important from a just transitions perspective because it determines the scale at which water will be governed; the guiding principles; whose vision, rights, and knowledge are recognized; how decisions are made and conflicts are solved; and through all this, the outcomes of water governance.

3.3 ACHIEVING JUST TRANSITIONS IN WATER GOVERNANCE IN BOLIVIA

Bolivia's approach to water governance, including the underlying normative framework, have changed significantly since the Water Wars. Those changes have helped address some equity, productivity, and sustainability issues, but inequalities and challenges remain. Those include both longstanding issues inherited from past governance systems, and new ones that have resulted from the power dynamics created by the current system.

Over two-thirds of Bolivians live in major urban centers.⁷⁰ There are significant inequalities between urban and rural areas, especially in the highlands and valleys. As of 2017, the rate of multidimensional poverty was much lower in urban areas (26.2 percent) than in rural areas (40.5 percent). This is partly due to the decline of small-scale farming and a historical discrimination of rural populations with regards to access to health, education, employment, housing, and other public services.⁷¹ However, there are also differences within urban areas. Many rapidly growing cities have seen the expansion of peri-urban areas characterized by high levels of poverty and vulnerability.⁷² In rural areas, too, there are some differences, based on access to irrigation, ethnicity, and gender, among other factors.⁷³

Upstream rural communities are closer to water sources and, to some extent, can influence water supply downstream, but many rural people still lack drinking water, irrigation, and overall water infrastructure. As noted above, there have been numerous water-related conflicts over the past two decades in Bolivia—not only over the water itself, but also over the rules, rights, and discourses that shape its use.⁷⁴ Power imbalances across social groups and geographic areas are core components of these conflicts, as they help determine how water and environmental impacts are distributed.⁷⁵

As described in Section 2.1 and 3.1, climate change and climate action pose additional challenges for ensuring the equitable and sustainable use of water resources in Bolivia. By default, climate responses will be

designed and implemented within the existing water governance landscape, which have become more inclusive, but continue to have significant structural limitations and institutional gaps. Applying a just transitions lens can shed light on the challenges and reveal opportunities to build a more sustainable and inclusive water system in the context of climate change.

The rest of this section examines key water governance challenges in Bolivia, drawing on interviews as well as a literature review. The analysis follows the Just Transition Initiative’s framework, looking at social inclusion issues, distributional issues, and transformational intent.⁷⁶ Whether and how these issues are addressed will determine the extent to which Bolivia’s transition to sustainable water governance can be deemed just.

3.3.1 SOCIAL INCLUSION ISSUES

Structural limitations in participatory mechanisms

Bolivia’s Constitution and legal framework on water establish social participation as a priority in water governance. However, in practice, existing mechanisms have not ensured meaningful participation. For instance, a study of the regular public accountability hearings implemented in Cochabamba’s municipal water company (SEMAPA) shows that their form and composition impeded broad social inclusion and engagement with stakeholders.⁷⁷ The hearings merely provided people with information, rather than enabling the co-design of structural reforms that address the sources of water-related inequalities.

Researchers have also found that environmental impact assessments have been deficient with regard to consultations with Indigenous Peoples.⁷⁸ Projects are required to obtain Indigenous Peoples’ free, prior, and informed consent, but communities can only provide such consent if they have access to the information needed to evaluate a project and the ability to make decisions collectively. In practice, projects have only been required to consult with community representatives, not entire communities,⁷⁹

and they have not provided adequate information on expected environmental impacts.⁸⁰

Moreover, participating in water governance can require resources and skills that poor and marginalized people often lack.⁸¹ For example, women in Bolivia tend to participate less in water governance than men. This is linked to many women’s lower levels of education as well as more limited knowledge of Spanish among Indigenous women; women often also have less experience with public speaking and participation.⁸² Social norms create further constraints, as public meetings are commonly seen as masculine spaces, and women’s domestic duties are often incompatible with the timing of meetings. All this makes it harder for women to get actively involved in participatory processes, such as meetings of associations of irrigators, local governments, water committees and cooperatives, and farmers’ unions, as well as in public consultations for new projects. Despite progress on various components of gender equality over the past decade, patriarchal values also continue to prevail in Bolivia, limiting women’s participation in decision-making.⁸³

However, this does not mean that women are not key actors in water governance in Bolivia. Some women participate in and play leadership roles in water committees and associations.⁸⁴ In rural areas, women are increasingly central in water distribution and consumption, including in tasks that were traditionally male, as seasonal migration from men to the cities has become more common.⁸⁵ There are organizations—such as the Syndical Confederation of Women Farmers “Bartolina Sisa”—that are giving a stronger voice and agency to women’s issues.⁸⁶ In the mining sector, which remains dominated by men, some women have organized to defend their interests (including access to drinking water in mining communities)—for instance, through the Network of Women in Mining. This indicates that there are existing avenues where women’s agency with regard to water can be strengthened.

While the principle of participation is present in legal and policy frameworks, there are gaps in terms of its implementation. Some groups remain marginalized

from water governance spaces, both because of institutional stakeholder engagement practices and because of structural conditions, such as patriarchal values and multidimensional poverty. A just transition in the water sector requires addressing the structural and normative obstacles to meaningful participation in decision-making about water resources.

Limited social inclusion in IWRM guidelines and implementation in Bolivia

The National Watersheds Plan (PNC) puts a strong emphasis on social participation and stakeholder engagement in the different components of watershed planning. It calls for interinstitutional participation in knowledge creation, sectoral inclusion in plan development, and community and women's participation in the social strategy. For each priority watershed identified in the PNC (see Figure 4), an interinstitutional platform has been set up to develop Watershed Master Plans (PDCs). This is a common approach in IWRM, which aims to avert and solve conflicts through multistakeholder engagement and collective discussions and decision-making about the allocation of water resources.⁸⁷ Such platforms have delivered PDCs in various watersheds, with the Katari and Rocha watersheds highlighted by the MMAyA as examples of best practices to be replicated in other watersheds.

However, the national guidance on river basin plans lacks a description of how exactly stakeholders should engage in assessing the implications of specific watershed and water management measures.⁸⁸ In addition, the approach requires the creation of new frameworks and institutional arrangements (e.g. watershed committees) to implement the PDCs and enable broad social participation. In practice, the levels of participation required, including national, departmental, and community-based, have yet to be reached, in part due to the lack of clear guidelines.⁸⁹ This situation is not unique to Bolivia. Research on water governance has identified several obstacles to inclusive and meaningful participation, including asymmetries of information and power, limiting institutional arrangements and process rules, a lack of resources to participate, and lack of motivation.⁹⁰

The new coordination mechanisms can also conflict with or create ambiguities with other governance mechanisms closer to stakeholder interests, such as irrigation associations or municipalities.⁹¹ Vertical and horizontal coordination across water and other sector institutions remains a challenge as well, and so are financial and institutional sustainability. As a result, not all PDC watershed committees are operational, which puts the implementation and sustainability of the plans in peril.

A key feature of just transitions is that they are based on a broad social dialogue to agree on a vision and measures to drive a shift to a low-carbon and climate-resilient society. As the main instruments for planning in Bolivia's water sector, PDCs can be developed and implemented with more participation, with adequate funding to enable the use of suitable collaborative planning tools and stakeholder engagement methods.

Political economy issues and disparate levels of influence

The Bolivian Constitution clearly states that water belongs to the people and gives the State the mandate to manage, regulate, protect, and plan for the sustainable use of water (Article 374). However, the right to access water is not guaranteed, and in practice, upstream rural communities' water rights prevail over water concerns in downstream cities.⁹² Some rural communities argue that under traditional water use practices (*usos y costumbres*), they cannot be denied access to water, nor can their water use be limited in any way. They use this as a bargaining strategy to influence political decisions within and outside the realm of water management.⁹³ This has enabled historically deprived areas to secure much-needed development improvements, such as investments in education, sanitation, and health infrastructure, as part of negotiated water agreements between upstream and downstream areas. However, it has kept other Bolivians who are not part of such agreements from meeting their basic water needs.

These asymmetries make local coordination, participation in water-related decision-making, and water resource management planning especially

challenging.⁹⁴ They have also led to (sometimes severe) conflicts between water users in upstream and downstream areas. In peri-urban areas, there have also been conflicts between different water uses, such as for agriculture versus domestic use.⁹⁵

These dynamics reveal tensions between the territorial approach to recognition of *usos y costumbres* and the Constitution's recognition of water as a common good.⁹⁶ As a result of those tensions, the allocation of water is subject to continuous political negotiations, with agreements and decisions revisited over and over. There have also been growing tensions among irrigators.⁹⁷ New arrangements are needed to address these tensions in a way that ensures meaningful inclusion of and constructive dialogue between all affected groups. Closing historical and structural development gaps in rural areas would also help ease water-related tensions.

3.3.2 DISTRIBUTIONAL ISSUES

Disparities in access to water

Between 2015 and 2020, the share of people in Bolivia with access to improved drinking water sources grew from 84.7 percent to 86.8 percent, with urban areas reaching 94.6 percent, and rural areas, 68.5 percent in 2020.⁹⁸ Still, although access has expanded, many marginalized communities in Bolivia rely on informal water distribution, such as vendors who sell water door to door, out of tanker trucks or other vehicles, which is generally costlier and less safe.⁹⁹ Rural areas need particular attention, as that is where the gaps in infrastructure and in basic services, and income inequalities, are the greatest.¹⁰⁰ However, there are also people in urban and peri-urban areas who suffer from discontinuities in the provision of water or lack access to municipal water services, and thus depend on water vendors, whose deliveries can be unreliable.¹⁰¹ Small private traders, network operators, community services such as cooperatives or associations, and neighbors who resell their water all contribute to filling gaps in public water service.¹⁰²



Increasing access to irrigation for farming is a key government priority to increase climate resilience and thus features among the water-related goals in the NDC. In 2020, about 11.5 percent of arable land had irrigation infrastructure.¹⁰³ Over the past decade, there have been significant public investments to expand access to water for farming, which have benefitted primarily small-scale, low-income farmers. Nevertheless, the technologies employed have had limited effectiveness, thus restricting opportunities for increased income, and failing to change the prevailing socio-economic conditions that result in seasonal migration of farmers to urban areas.¹⁰⁴ Moreover, even in areas where irrigation infrastructure exists, not all farmers may be able to access it. Factors such as the farm's location relative to the canal system, the water rights each farmer holds, and even gender influence access levels.¹⁰⁵

Some water uses have also received less attention and tend to be deprioritized in the allocation of scarce water resources, such as for small-scale fisheries, cultural uses, and ecosystem services. Indeed, water plays an essential role for social organization and cultural activities in various areas of Bolivia.¹⁰⁶ Environmental use of water is also essential, notably in *bofedales*, as these wetlands areas regulate soil and nutrient cycles of mountain watersheds and influence the water balance.

As climate change increases pressures on water systems, it is important to improve access to reliable and safe water, in order to increase communities' resilience. In this context, the type of collective water delivery systems installed to fill these gaps in access

to water (for instance, small-scale and community-managed, or large-scale and managed by public enterprises) and their location will determine how benefits and burdens will be distributed, and how much influence and power local populations will have related to water management decisions.

Worsening water quality and pollution from mining, industry, agriculture, and untreated wastewater

Water quality is a significant challenge in both rural and urban areas,¹⁰⁷ and it has tended to worsen as a result of degraded watersheds and deficiencies in the operation and maintenance of drinking water systems. Although the share of the population using safely managed sanitation services increased from 57.1 percent to 62.5 percent between 2015 and 2020, large differences remain between urban areas (70 percent) and rural areas (45 percent).¹⁰⁸ Moreover, only 30.5 percent of household and industrial wastewater was being treated as of 2020.¹⁰⁹ The poor management of wastewater from mining is of particular concern, given its impacts on human and environmental health and on productive activities downstream.¹¹⁰ Other extractive industries, such as gas production, have also been of concern at the local level.¹¹¹ Research indicates that Indigenous women are especially affected by this, because they heavily depend on subsistence farming and because they collect and handle significant amounts of water as part of their role as caregivers for children, the elderly, and sick and disabled persons.¹¹²

Universal access to clean water, prevention of further pollution, and the rehabilitation of polluted watersheds are all important for building climate resilience. At the same time, from a just transitions perspective, it is crucial that the development of industrial activities linked to national and global climate action is handled in an environmentally and socially sustainable way. A key principle in that context is that those responsible for polluting water should cover the costs of cleaning it and remediating any damage caused.

Limitations in water governance, including inability to solve conflicts

Bolivia has no recent overarching water law that regulates water use across all sectors in an integrated manner. Instead, it has various sectoral laws (for instance, on water for irrigation, or drinking water) and provisions in other sectoral regulatory frameworks (such as the mining law and electricity law). As a result, there are significant gaps, inconsistencies, and contradictions in the legal and institutional landscape.¹¹³ Moreover, the allocation of responsibilities is unclear, and there is limited interinstitutional coordination, both between national and subnational entities, and across sectors.¹¹⁴ The lack of a legal basis to make decisions about conflicts regarding water use across sectors, and the absence of a formal institution with a mandate to do so, is a key challenge from a just transitions perspective.

The resulting conflicts between water users are particularly visible in areas where there are multiple drivers of increased demand, such as urbanization and the expansion of commercial agriculture.¹¹⁵ Bolivia's plan to rapidly scale up hydropower production could also increase tensions.¹¹⁶ The use of water in mining is another key concern here: in practice, and despite the Constitution privileging water for life (Article 374), the current legislative framework privileges water use for mining, which limits other water uses and has generated conflicts.¹¹⁷ Mining cooperatives have considerable power in the Bolivian political system,¹¹⁸ and they have been able to use water associated with mining concessions without adequate environmental controls.¹¹⁹ The important role of extractive industries in the country's development strategy, and in particular the goal of "industrialization with sovereignty,"¹²⁰ also contributes to these tensions.¹²¹ Indeed, macroeconomic performance depends to a large extent on the extractive sector.¹²² Mining also employs a large workforce, most of which is informal: 137,000 direct jobs in 2016, and 684,240 indirect jobs, according to the Ministry of Mining and Metallurgy.¹²³

Climate change impacts on water systems will make meeting water demand from different sectors even

more difficult, increasing the risk of conflicts. There is thus a need for institutional and legal arrangements that enable a fair allocation of water among sectors and user groups, in accordance with the Constitution. This requires improvements in laws, licensing and concession processes, as well as information (such as hydrometeorological monitoring and projections) and technical assistance.¹²⁴ The manner in which these tensions are ultimately resolved will help determine how just the transition is.

Limited benefits for marginalized groups under the current governance system

While the institutionalization of *usos y costumbres* has provided some rural residents with more agency and control over water resources, it also hides inequalities within the Bolivian rural population,¹²⁵ as it mainly benefits farmers who already have access to irrigation. As noted above, as of 2020, only about 11.5 percent of Bolivia's arable land was equipped for irrigation. Farmers without irrigation are more vulnerable to droughts, frosts, and climate change impacts than those with irrigation.¹²⁶ Obtaining irrigation rights depends on the contributions that families can make to the implementation of irrigation projects, which can be in cash or labor, so poorer families and people with disabilities typically tend to be excluded.¹²⁷ Moreover, only communities and organizations that are able to record their water consumption through registries, can have their traditional uses recognized.¹²⁸

The concept of *usos y costumbres* also favors communities with primarily agriculture-based livelihoods, such as Quechua- and Aymara-speaking peoples in Bolivia's highlands and Andean valleys.¹²⁹ However, many Indigenous communities in the lowlands, for instance, do not farm as their main livelihood.¹³⁰

Women also tend to be underserved and underrepresented in the current water governance system, such as in the associations of irrigators.¹³¹ Land ownership, a precondition for obtaining irrigation rights, is predominantly male, and households led by single women are also often

among those who cannot afford to make the necessary contributions to obtain irrigation rights.¹³² Men also hold the majority of registered rights for drinking water systems.¹³³

Improving water access for those who are now left out is essential to building adaptive capacity across Bolivia, especially among the most vulnerable communities and households, who often lack the assets, access to natural resources, social networks, or education needed to adapt. That is particularly true of those who depend on surface water from glacial melt and rely on it for agricultural production—often small, low-income communities.¹³⁴ Achieving just transitions in the water sector requires that water governance rules and norms recognize and address these different types of inequalities.

Hydrometeorological data are limited and not accessible to all who need them

There has been considerable progress in building water-related data and information systems in Bolivia over the past decade. One example is the Bolivia National Surface Water Balance for the period between 1980 and 2016, which provides baseline information that can be used to generate knowledge and is serving in the drafting of local plans for water use.¹³⁵ Nevertheless, there are relatively few high-standard hydrometeorological stations, and data quality control has been inconsistent.¹³⁶ Data collection and treatment is also fragmented across institutions, internationally funded projects, and private actors.

The lack of reliable data on water and climate conditions is not only a barrier to building adaptive capacity and informing climate-resilient planning. It also creates the risk that more water licenses will be assigned than a given water system can support. That, in turn, can exacerbate water stress in some communities, especially as climate change makes supplies more variable.

Moreover, as environmental information underpins the identification of issues and the choice of governance solutions, it matters who controls

the production of the knowledge that is deemed relevant for decision-making. Lack of information—and difficulties in accessing it—is a key obstacle for effective societal participation. This limitation undermines existing participatory mechanisms in Latin America, such as prior consultations to obtain the free, prior, and informed consent of Indigenous Peoples about decisions that affect them; the environmental impact assessment process; and *actio popularis* (a mechanism that enables anyone to object to illegal acts in environmental matters without having to prove they are directly affected).¹³⁷

It is also important to note that other sources and types of information, such as traditional and local knowledge, can provide valuable complements to technological and scientific sources and inform water-related decision-making.¹³⁸ For example, in Bolivia, community members with deep territorial knowledge sometimes carry out inspections to assess and record, often meticulously and with samples, the potential social and environmental impacts of planned projects as part of the prior consultation process.¹³⁹ However, their contributions are often dismissed by public officials, who consider them inferior to the environmental impact assessments prepared by consultants.¹⁴⁰ Who gets access to and has control over hydrometeorological information informs decisions about water allocation, across sectors and geographies. From a just transitions perspective, it is crucial to improve access to detailed, reliable hydrometeorological information, and to recognize the knowledge of Indigenous Peoples and community members in decision-making.

3.3.3 TRANSFORMATIONAL INTENT

Most transitions work within existing social, economic, and political structures, making incremental reforms to obtain the desired results. However, when the existing structures are perpetuating poverty, inequality, or other injustices, achieving just transitions may require working to transform those structures to make them more compatible with sustainable development and equity. As discussed in the introduction, this is what the Just Transitions Framework refers to as transformational intent.



In the context of water governance in Bolivia, transformational intent might mean seeking to address multidimensional poverty, build local and institutional adaptive capacity, improve the water legislative framework, or redirect public investments towards rural areas, for instance. Other key elements include improving public access to high-quality hydrometeorological information, enabling meaningful participation by stakeholders—especially marginalized groups—in all phases of policy making and project design and implementation, and challenging the social norms that limit participation by women and other groups. The degree to which a plan or action is deemed as seeking transformation will also depend on whether the winners and losers are identified from a narrow perspective (focusing on direct and immediate impacts), or more broadly (including indirect and long-term impacts), and whether measures to support them are primarily compensatory or seek to reduce the underlying causes of their vulnerability.

It is important to stress that the causes of inequalities and of environmental issues are not only domestic. Global trade dynamics and development norms are powerful drivers of inequalities and tension in Bolivia. Transformational intent may therefore imply focusing on global dynamics that are driving an expansion of polluting mining practices and are, more broadly, promoting water commodification for the benefit of the few, generating tensions within Bolivia, where water has traditionally been seen as a common good.

Table 1 summarizes insights from this section to provide an overview of the need for a just transition in the water sector in Bolivia, what it would entail, and the main challenges.

Table 1.
KEY JUST TRANSITION ISSUES IN BOLIVIA'S WATER RESOURCE GOVERNANCE

TRANSITION AREA	THE NEED FOR TRANSITION	THE JUST TRANSITION VISION	THE TRANSITION CHALLENGE
Access to water	<p>Climate change is reducing water supplies through changes in rainfall and glacier retreat.</p> <p>Many households in rural areas and urban peripheries lack access to drinking water.</p> <p>Most farmers have no irrigation.</p> <p>Some water uses, such as for ecosystem services, cultural use, and small-scale fish farming, are deprioritized in the allocation of increasingly scarce water resources.</p>	<p>All Bolivians have access to drinking water, whether they live at high elevations or in urban areas downstream.</p> <p>Farmers can boost their climate resilience through irrigation, with access to infrastructure, training, and technology.</p> <p>Sufficient water is secured for ecosystem services, cultural use, and the livelihoods of disadvantaged groups.</p>	<p>Water delivery systems are fragmented and disparate: from small-scale and community-managed systems, to large-scale and publicly managed ones. This makes it difficult to plan changes together.</p> <p>Disadvantaged groups often lack the assets, access to natural resources, social networks, or education needed to influence decisions, much less drive changes to boost their water security and climate resilience.</p> <p>There is an unmet need for high-quality hydrometeorological data.</p>
Water quality	<p>Pollution from mining, industry, agriculture, and untreated wastewater reduces water quality, with impacts on health, rural livelihoods, and the environment.</p> <p>There are risks that global decarbonization efforts—which are driving growth in lithium and other mining in Latin America—could undermine water security and exacerbate tensions.</p>	<p>Polluting activities, including those driven by clean technology value chains, are stopped, and watersheds are rehabilitated, increasing peoples' access to clean water and boosting their resilience to climate change.</p>	<p>The implementation and enforcement of environmental laws and regulations is limited.</p> <p>Extractive industries are major drivers of economic growth and sources of tax revenues.</p> <p>There is limited awareness of the environmental and social impacts of clean energy value chains, and ethical standards—domestic and international—are inadequate.</p>
Conflict over water resources	<p>Climate change impacts—current and projected—are reducing water supplies, which is likely to exacerbate competition and tension over water resources.</p> <p>Sectoral water use is expected to increase, especially in agriculture, industry, and energy.</p>	<p>Institutional and legal arrangements are in place that enable the fair allocation of water among sectors, user groups, and nature, including during episodes of water crisis.</p> <p>The underlying causes of communities' water and climate vulnerability are addressed, going well beyond purely compensatory approaches.</p>	<p>Bolivia has no recent overarching water law that regulates water use across all sectors in an integrated way.</p> <p>Institutional responsibilities need to be clarified, and better coordination is needed across institutions.</p> <p>Complex historical and structural development gaps in rural areas contribute to tensions over water allocation, requiring broad and deep reforms.</p> <p>Some rural communities use traditional water use customs as a bargaining strategy to influence political decisions within and outside the realm of water management. This makes dialogue and fair reform difficult.</p>
Social inclusion	<p>Community participation in decisions over water resource management is limited, hampering their abilities to make decisions that will strengthen their resilience to climate change.</p> <p>Some disadvantaged groups, such as (but not exclusively) poor families and women in rural areas, remain marginalized from water governance spaces.</p> <p>Communities' local and traditional knowledge is often not recognized in higher-level water decision-making processes.</p>	<p>Disadvantaged groups are included in all water governance spaces.</p> <p>Community organizations are meaningfully engaged in the development and implementation of Watershed Master Plans (PDCs), from defining issues and priorities to monitoring implementation.</p> <p>Local and traditional knowledge is integrated into water-related decision-making.</p>	<p>Structural conditions, such as patriarchal values and multidimensional poverty, pose real barriers to broadening and deepening participation in water governance.</p> <p>There can be overlaps or conflict between integrated water resource management (IWRM) coordination mechanisms and other local governance mechanisms, such as irrigation associations or municipalities.</p> <p>While the institutionalization of traditional water use practices has given some rural residents more agency and control over water resources, there are risks that it can hide inequalities within the Bolivian rural population, as these practices mainly benefit farmers who already have access to irrigation.</p> <p>Lack of climate data and information—and difficulties in accessing it—can hinder effective societal participation in water-related decision-making.</p>



4. THE CLIMATE INVESTMENT FUNDS IN BOLIVIA

This section describes CIF's work in Bolivia under its Pilot Program for Climate Resilience (PPCR). The PPCR projects are then analyzed in Section 5 in terms of their distributional, social inclusion, and transformational implications.

CIF's US\$1.2 billion PPCR aims to pilot and demonstrate approaches to integrate climate risk and resilience into core development planning and implementation.¹⁴¹ In the PPCR's first, preparatory phase, countries receive technical and financial support to develop an investment plan (known as a Strategic Program for Climate Resilience), based on an analysis of policies, strategies, and development plans that need to be updated to achieve climate resilience, combined with a mapping of key agencies and institutions. In its second phase, the PPCR provides financial support to countries to implement their Strategic Program for Climate Resilience.

In Bolivia, the priorities and activities to be supported by the PPCR were defined through a participatory

process that took place between September 2009 and September 2011. In accordance with CIF's programmatic approach,¹⁴² a series of national and regional workshops were organized with a wide range of societal actors, including national, departmental, and municipal public institutions; academic institutions; the private sector; non-governmental organizations; foundations; and social movements.¹⁴³ The process led the Bolivian government to decide to focus on strengthening the country's capacity to define and implement IWRM as a structural element for a climate resilience strategy at the central level and in prioritized sub-basins. With this focus on water governance, the aim for the PPCR has been to help achieve the water-related goals of the 2006–2011 National Development Plan and to support the implementation of the National Watershed Plan.

In order to draw lessons on just transitions in the context of water governance, this study focuses on the two largest CIF projects in Bolivia:¹⁴⁴ the IBRD's Climate Resilience–Integrated Basin Management Project

(hereafter called the Climate Resilience-IBM project), and the IDB's Multi Drinking Water and Irrigation Program for the municipalities of Batallas, Pucarani,

and El Alto (hereafter called the Multipurpose Project). Both are large projects with several components (Figure 5).

Figure 5.
KEY COMPONENTS OF THE PPCR PROJECTS IN BOLIVIA¹⁴⁵



Disclaimer: The description of the PPCR components above has been simplified. For a detailed picture, see the Strategic Program for Climate Resilience of Bolivia.¹⁴⁶

4.1 THE CLIMATE RESILIENCE-IBM PROJECT

The Climate Resilience-IBM project was implemented between 2013 and 2020, in collaboration with the MMAyA, the National Fund for Productive and Social Investment (FPS), and the Secretariat for River Basin Planning in Cochabamba (SDC). CIF funding totaled US\$36.79 million. At appraisal, the Government committed counterpart funding of US\$25.9 million, but it ultimately made no contribution at all, due to severe fiscal constraints. The project had three main components:

The **climate resilience component** aimed to strengthen the national government's capacity to integrate climate resilience into public planning, management, and investments. It included activities to improve the design, equipment, and software of the national climate and water information system, at both the national and subnational levels. Finally, it included an update of water planning methodologies and investment guidelines to include climate change considerations, as well as capacity building of government officials to use these new tools.¹⁴⁷

The **PDC component** aimed to strengthen adaptive capacity in the Rio Grande River Basin. Activities included building institutional capacity, strengthening institutions to enable greater stakeholder participation, improving water and climate information systems in three pilot sub-basins (Rocha, Mizque, and Arque-Tapacarí), and facilitating a participatory approach to the formulation of a climate-resilient integrated river basin management plan in each pilot sub-basin.

The third component, labeled as **“infrastructure and integrated watershed management”** (*manejo integral de cuencas*, or MICs) for the purpose of this study, consists of designing and implementing both infrastructure—such as building flood defenses and improving irrigation canals—and non-structural subprojects to increase climate resilience. The latter include land use and water protection measures such as soil and forest conservation and reforestation, referred to as IRBM measures in the Bolivian context (see Section 2.2.1).

The second and third components were implemented in three watersheds. Initially, these were the Rocha and Mizque watersheds in the Andean valleys, and the Piraí watershed in the lowlands. Piraí was later replaced by the Arque-Tapacarí watershed in the Andean valleys. Overall, these geographical areas are fairly representative of the challenges that Bolivia faces when it comes to water governance in the Andean valleys and highlands. In the valleys, the Rocha watershed is very polluted, particularly by household and industrial wastewater.¹⁴⁸ The Mizque watershed experiences many droughts and has a large farming population. Arque-Tapacarí watershed also faces severe droughts and has high levels of poverty and a significant Indigenous population.

4.2 THE MULTIPURPOSE PROJECT

The Multipurpose Project, which began in 2015 and is scheduled to end in 2023, has been implemented by the MMAyA through EMAGUA, with funding from CIF, IDB, and the Nordic Development Fund.¹⁴⁹ Expected project funding is US\$133 million, including US\$42.50 million from CIF, US\$62 million from IDB, US\$4.37 million from the Nordic Development Fund, and US\$24.15 million from local governments. The aim is to improve water access, accounting for climate resilience considerations, in three highland municipalities: El Alto, which includes the fast-growing city and surrounding communities, and Pucarani and Batallas, which are adjacent to each other and encompass multiple small settlements on the Cordillera Real.

In El Alto Municipality, the project will improve water service, enabling more than 750,000 people to have reliable access to drinking water. The targeted communities are among the poorest in the city. In the municipalities of Pucarani and Batallas, the project is expected to bring potable water to 13 communities, benefitting nearly 1,800 Indigenous households; provide 6,600 farmers with access to improved irrigation services; train local residents to improve their resilience through sustainable soil management, restoration of degraded areas, and water conservation, among others; and build local capacities for settling disputes and for supporting

decision-making for sustainable and resilient management of the water supply. The project includes three components:

The **drinking water component** aims to increase the availability of drinking water in El Alto city and 13 communities in El Alto and Batallas municipalities by building, updating, and expanding water systems from two dams and several river catchments. It also consists of social management measures—that is, activities to identify and address the impacts of involuntary resettlement and economic displacement, including through health promotion, as well as a communication and community relations program, training for conflict resolution, and a plan for community management of efficient water use. Activities to strengthen institutions are included as well, to support the sustainable management of water services. In addition, this project component includes a program to empower women in Batallas Municipality, added to help address issues raised by the environmental and social impact assessment.

The **irrigation component** aims to improve and expand irrigation systems in Batallas and Pucarani municipalities. It includes expanding and improving the irrigation infrastructure, as well as providing technical assistance to increase the efficiency of water use and agricultural productivity in the context of climate change at the community level. There are plans to create a Multipurpose Technical Commission (COTEMU) to administrate water distribution for drinking water and irrigation through the infrastructure created by the project, which requires the coordination of efforts by different actors and institutional levels.

Finally, the **MICs component** supports the development and implementation of IRBM measures in communities within Batallas and Pucarani municipalities, which were identified using a comprehensive diagnostic and prioritization process with the communities in the project area. It also includes the development of a system for hydrological monitoring and observation of the watershed and measures to strengthen institutional capacity

to manage climate change at the municipal and community levels.

4.3 THE PPCR AND THE WIDER CLIMATE FINANCE LANDSCAPE IN BOLIVIA

CIF and other international donors are deeply engaged in supporting adaptation and the transition to sustainable water management in Bolivia. Between 2008 and 2018, two-thirds of climate finance destined to Bolivia targeted adaptation. In this period, almost half of disbursed climate finance went to the water and sanitation sector, followed by agriculture, forestry, and fisheries (20.6 percent) and general environmental protection (10.3 percent).¹⁵⁰ Funders worldwide disbursed US\$1.01 billion in development finance to Bolivia for water supply and sanitation project, with the IDB, the European Union (not counting the European Investment Bank), France, and Germany being the biggest funders. About two-thirds of these resources went into key areas for the PPCR: water sector policy and administrative management (22.9 percent), river basin development (20.4 percent), and large systems of water supply and sanitation (22.7 percent).

Several funders have supported the development of IWRM plans, as they provide high-value output, benefit large numbers of people, and allow for the disbursement of large amounts of resources because of the nature of the activities involved.¹⁵¹ In this context, coordination and consistency are essential. The PPCR has coordinated with the Funds Basket for the National Watershed Plan. This funding mechanism brings together institutions and international cooperation agencies active in the water sector (currently including Sweden's, Switzerland's, and Germany's) to coordinate and increase the effectiveness of their support to implement the National Watershed Plan in Bolivia. It provides a platform for dialogue on sectoral policies, strategic objectives, and implementation, monitoring, and evaluation strategies.



5. INSIGHTS FROM CIF'S ACTIVITIES IN BOLIVIA

The activities of both the Climate Resilience–IBM project and the Multipurpose Project are highly relevant to achieving just transitions in water governance in Bolivia, though neither was designed specifically with a just transitions framing. This section thus applies a just transitions lens to the two projects not as an evaluation of their performance, but in order to draw lessons about how to address the social inclusion, distributional impacts and transformational intent issues described in Section 3.3 in future project planning and implementation.

5.1 SOCIAL INCLUSION ISSUES

5.1.1 SUSTAINING ENGAGEMENT WITH COMMUNITY ORGANIZATIONS

The PPCR projects have engaged with a diverse set of organizations—such as associations of irrigators, farmers, livestock producers, and fish farmers, as well as women’s organizations and neighborhood councils. The approach has been to interact with representatives selected by each organization, who relayed information, requests, and concerns between the communities and the project. During the environmental and social impact assessment (ESIA) consultations, calls for meetings were promoted through farmers’ and irrigators’ organizations as well as through municipal governments, in order to reach a wider audience.

KEY INSIGHTS

- **Broad and sustained stakeholder engagement:** Besides municipal governments, the PPCR projects have engaged with a broad set of representatives of stakeholder groups, including farmer, livestock producer, and farmer irrigator organizations; women's organizations; and neighborhood councils, especially at the beginning of the projects. They highlight the challenges and opportunities associated with achieving direct and sustained engagement with more members of these groups, in order to expand the range of perspectives while ensuring accountability and social acceptance throughout projects.
- **Engaging marginalized groups:** The PPCR projects highlight challenges in involving marginalized groups in project activities. Women's participation has depended both on their social and economic roles in different communities, and on how the spaces for participation were set up. Formal and informal power structures within communities affect whose voices are heard and whose priorities prevail in decision-making. Resource constraints can also exclude marginalized groups.
- **Intersectoral collaboration:** The PPCR projects' main counterparts at the national and subnational levels were the institutions in charge of water and environmental policy. In practice, during the implementation other sectoral ministries and agencies were involved to facilitate agreements between different water users. Some kind of interministerial coordination mechanism would have enhanced project implementation. This highlights the need for intersectoral collaboration beyond the water and environment sectors to plan and implement IWRM and just transition measures.
- **Local knowledge:** The PPCR projects incorporated local knowledge in different ways, and this helped shape activities to make them more relevant to the beneficiaries and avoid unintended consequences. Through this, local actors' capacities and ability to engage in water governance has also been enhanced.
- **Enabling water sharing agreements:** There have been political challenges in negotiating water-sharing agreements among water users and defining future water infrastructure governance arrangements. These challenges draw attention to the need to fill development gaps in rural areas to enable water-sharing agreements between upstream and downstream water users across Bolivia. They also highlight the importance of socially inclusive negotiation and coordination mechanisms for water management.

Both projects have had dedicated external and local consultants hired to ensure continuous communication with community stakeholders. The safeguard process and planning activities required engagement with a wide range of stakeholders, and the projects were initially successful in that regard. However, over the course of the Climate Resilience-IBM implementation, the role of social organizations decreased in some of its components—and, with it, engagement with communities. The PDC process in particular has had limited involvement and communication with affected stakeholders, in part due to a combination of administrative and resource constraints and the pandemic. Bolivian authorities, who are leading implementation, have been inclined to communicate more with technical officers from relevant institutions and municipal governments, which tend to engage more actively in project activities, as they provide co-funding and are therefore likelier to have more resources to support their continued involvement.

From a just transitions perspective, it is important to ensure that a broad range of stakeholders, including vulnerable and marginalized groups, remain engaged throughout the duration of projects. Otherwise, there is a risk that the project's benefits become concentrated in the hands of a few stakeholders and therefore, public support for the project could be lost.

A related concern raised in the adaptation literature is that working with local organizations does not necessarily ensure just outcomes, as the organizations may not always be representative of the broader community—especially the most vulnerable.¹⁵² Direct engagement of vulnerable groups may also be constrained by community-agreed channels for communication with project implementers. Having a diversity of participation spaces (see Section 5.1.2) and collaborating with diverse organizations can help reduce—although not completely address—this challenge.

5.1.2 CREATING INCLUSIVE SPACES FOR PARTICIPATION

Community stakeholders have been involved in the PPCR projects in three main ways: through consultations as part of the ESIA, during the development of PDCs and IRBM measures (MIC projects), and through capacity-building activities.

ESIA consultations

Both projects triggered a series of safeguards and thus required public consultations (see Section 5.2). Responsibility for the ESIA consultations lay with the project implementer: in the Multipurpose Project, the MMAyA, which hired a consultancy firm to do the work, and in the Climate Resilience–IBM project, the Secretariat for River Basin Planning in Cochabamba (SDC) or the National Fund for Productive and Social Investment (FPS), depending on the type of measures/investments being assessed.

In both projects, the ESIA consultations were mainly informational and directed to community leaders. In the Multipurpose Project, for instance, the consultations targeted local authorities and leaders of farmers' and irrigators' associations, including local chapters of women farmers' group Central Agraria Bartolina Sisa. Most who attended were people with some type of democratic authority¹⁵³ in the community, although others also participated. The sessions involved a presentation describing the project, its possible social and environmental impacts, and suggested mitigation measures, and participants were then able to ask questions and share their concerns and demands. The consultations were conducted in the Aymara language and adhered to the assembly procedures established by the communities.¹⁵⁴

PDC development

Until 2006, PDCs were developed by experts and planners. However, since then, there have been considerable efforts to develop a more strategic and participatory approach. According to national guidelines, the development of PDCs must involve an interinstitutional platform, composed of a technical council and a social council. The technical council typically includes departmental water public institutions, municipalities, public and social water and sanitation enterprises (EPSAs), academic experts, and, when the process is supported by international cooperation, funders' representatives. The social council, meanwhile, includes representatives of various social sectors, including farmers' and irrigators' associations. The development of PDCs thus provides important spaces for stakeholders to contribute to shaping water resource management at the watershed level.

Three PDCs were developed under the Climate Resilience–IBM project: for the Mizque, Rocha, and Arque–Tapacarí watersheds. The approaches taken varied, but neither the Rocha nor the Arque–Tapacarí PDC processes involved their respective social councils, due to the COVID-19 pandemic as well as political hurdles that delayed their establishment and kept them from meeting. In the Rocha watershed (see Box 1), some additional stakeholders were involved at the beginning, in the identification of issues and their prioritization, although further activities were conducted with the technical council only. In the Arque–Tapacarí watershed, consultations with communities were organized beforehand, but the development of the PDC involved only technical experts and municipal councilors. This could affect local ownership of the PDC and thus pose risks for its implementation. It also likely limits the ability of the PDC development processes to identify and tackle structural inequalities. Time and resource limitations also thwarted a plan to consider climate change scenarios in developing the PDC for the Arque–Tapacarí watershed. This means that the measures and investments included in the plan risk not being climate-resilient.

Another challenge with the PDCs is maintaining meaningful stakeholder engagement in the long term. Community organizations and municipalities have limited financial resources or staff to organize and participate in the meetings, and transportation can also be a challenge. In the case of Arque-Tapacarí for instance, the SDC (at the departmental level) hired a technical consultant to support PDC implementation at the local level. Once PDCs are developed, a Watershed Management Unit needs to be set up to

implement the PDC across the watershed according to Bolivia's institutional framework for water. This is a complex process due to resources limitations and local politics. It is also not always clear how this and other watershed management participation mechanisms fit in with existing local water governance mechanisms. PDC implementation in the Katari and Rocha has received additional international cooperation support.

Box 1.

DEVELOPING A CLIMATE-RESILIENT PDC IN THE ROCHA WATERSHED

The development of the Rocha PDC was led by the Stockholm Environment Institute, which has developed an approach, called "Robust Decision Support" (RDS),¹⁵⁵ that enables stakeholders to evaluate the potential benefits and drawbacks of different water management options in the context of external factors such as climate change, population growth, and economic development.

The Rocha PDC was developed through iterative stakeholder engagement, supported by capacity building, to identify potential adaptation measures and water-relevant uncertainties in the watershed.¹⁵⁶ More than 100 stakeholders were identified through an initial mapping exercise, based on their participation in water governance from a political, social, environmental, or economic perspective. The relationships among those stakeholders were also assessed. The exercise highlighted political tensions around water management in the watershed and stressed the need for improving social equity and environmental sustainability in water management. It also informed the design of the interinstitutional platform for the Rocha watershed.

The RDS approach allowed for a broad range of stakeholders (broadly those identified in the mapping exercise) in defining and prioritizing the issues to be addressed in the PDC. After this first stage, the departmental government and the Vice Ministry of Water Resources and Irrigation (VRHR) created the interinstitutional platform for the watershed to distinguish and discuss the positive and negative interactions between water management decisions related to the system's performance, the management of hydrological risks, and ecosystem functions maintenance, taking into account climate impacts. For this subsequent phase, only the technical committee was involved, which includes water academic experts, ESPAs, the SDC, and representatives of municipalities and municipality associations.

The process assumed universal water access and identified and quantified the need for compensation for those who might be negatively affected by measures included in the plan, which facilitated decision-making. The resulting PDC includes a wide range of measures, covering everything from flood control to a plan for financing implementation. The substantial stakeholder engagement ensured strong ownership and also helped strengthen technical capacities at the subnational level.

However, the Rocha watershed is under such stress that it cannot support universal water access without risking conflicts, so the PDC process concluded that some water would need to be brought in from neighboring watersheds. A separate project funded through bilateral Swedish aid, Bolivia WATCH,¹⁵⁷ is examining the implications for ecosystems and people in those watersheds. The Rocha PDC process could not do so because of Bolivia's watershed-based approach to planning and because such an analysis would require integrating all relevant measures from other territorial plans. For future PDCs, being able to incorporate them at the outset would reduce trade-offs among planning instruments and potential conflicts between water uses that may emerge during the implementation phase.

IRBM measures (MIC projects)

Both the Multipurpose Project and the Climate Resilience–IBM project have supported the development of IRBM plans and measures (MIC projects) and their implementation. In the Multipurpose Project, MIC projects were developed by consultants hired by the MMAyA, who developed a diagnostic and a draft plan that was then presented to and negotiated with beneficiaries.

In the Climate Resilience–IBM project, the initial intent was for the choice of infrastructure measures to be participatory, but because of delays in implementation, public institutions selected some “no-regrets” projects that were considered necessary and helpful in reducing vulnerability. For the MIC (non-infrastructure) projects, social and community leaders were approached for input first, then beneficiaries, and then projects were submitted for approval by the municipalities. In the process, adjustments to the MIC projects were sometimes made in response to local stakeholders’ preferences and knowledge. For instance, reforestation projects focused not only on native species, but also on fruit tree species that could produce income more rapidly. In the Arque–Tapacarí watershed, at the request of municipal councilors, experts conducted their diagnostic using a more detailed spatial subdivision (more hydrographic units) than initially planned. The project also supported the creation of grassroots-level water management organizations. These sought to actively involve women and played a key role in engaging families in local projects such as communal reforestation measures.

Other spaces for participation

The PPCR projects both implemented communication and engagement strategies. For instance, in the Multipurpose Project, there have been continuous discussions and negotiations with stakeholders, focused mainly on addressing new compensation demands from local people. Additional meetings have been organized throughout the project, such as at the start of new phases of implementation, when key local authorities have changed, or when disagreements

have emerged. However, ad-hoc meetings have not always been helpful, as participation was hindered by transport constraints and other issues. Instead, the project implementer, EMAGUA, has agreed with local authorities to attend monthly community meetings (both in municipal centers and in other parts of the municipalities) that are open to all residents and are conducted in the Aymara language. The time devoted to the project at these meetings can be limited, but they provide a better sense of local issues and community members’ development priorities. Local people have used the meetings to convey demands and complaints about the project. The project has also opened local offices in the municipalities where it operates, where facilitators were hired to address requests and concerns.

5.1.3 INCLUSION OF MARGINALIZED GROUPS

Women were identified from the start as an often marginalized and especially climate-vulnerable group. Women are key water users in Bolivia, mostly by collecting it for domestic use, but they are rarely involved in decision-making. Priorities for water infrastructure and service improvements notably vary by gender, with women most concerned about sanitation solutions, while men tend to prioritize irrigation infrastructure. Because of men’s greater influence, irrigation tends to prevail.¹⁵⁸

Women’s participation in the PPCR projects has varied across components and activities. A key factor is the social and economic roles played by women in each place. For instance, there is an area with significant flower production where women have been more involved in the definition of IRBM measures than is typical. In this case, their expertise and views were better represented because men generally perceive flower production as a feminine activity. The degree to which women are organized also affects their participation. In the ESIA for the Multipurpose Project, the Bartolina Sisa women farmers’ organization was very active and raised intergenerational equity concerns, among others.¹⁵⁹ Still, on average, women made up less than a third of participants in the ESIA public consultations.

The way in which participatory spaces are designed and managed also matters. When the spaces are created specifically for a project (for instance, interinstitutional platforms, Watershed Management Organizations, or ESIA public consultations), experience with the PPCR shows that women's engagement can be increased through targeted invitations, economic or other types of support, the choice of an accessible location, and scheduling around women's availability (taking into consideration both their social and economic roles). Skillful facilitation can help engage women as well. Within existing community discussion and decision-making spaces, however, it is more difficult to overcome social structures that limit participation.

When implementing the Indigenous Peoples Safeguard, the Climate Resilience-IBM project found that in the Rocha watershed, the Indigenous population is not formally organized, whereas in the Mizque watershed, there is one Native Communal Land, Raqaypampa.¹⁶⁰ This suggests that it might be easier to consult Indigenous people in Raqaypampa and involve them in project activities. However, in practice, barriers remain that contribute to keeping them on the sidelines and limit how they may benefit from the project. For example, although the leaders of Raqaypampa said the community was interested in participating in the project and developing MIC projects, they were not able to meet the co-funding requirement (municipalities were asked to contribute 20 percent of the budget for the implementation of MIC projects) and thus could not benefit from this project component.

The practice of requiring co-funding was considered key for ensuring local ownership and commitment. However, as with Raqaypampa, it can impede participation of the poorest and most marginalized municipalities and Indigenous territorial organizations. Nonfinancial alternatives are sometimes considered, but such arrangements have made it difficult to keep project schedules, as progress is dependent on beneficiaries' time availability.

The PPCR projects have sought to include a diverse range of voices in public consultations and other types of activities. However, the power structures within communities influence who participates and how. Resource constraints can also keep marginalized groups, such as Indigenous communities, from being able to participate and share in the benefits from projects.

5.1.4 GOVERNMENT INVOLVEMENT

The PPCR projects have engaged with a broad range of public stakeholders, including municipal governments as well as national and departmental environment and water institutions, such as the MMAyA, the SENAMHI, EMAGUA, the SDC, and the FPS. The Ministry of Planning and Development was also involved, especially during the project design stage. In addition, the Multipurpose Project also works with public and social water and sanitation enterprises (EPSAs). The collaboration with subnational institutions has been an important aspect of the program and required special efforts to set up, given that all funding goes through the national government.

The PPCR collaborated mainly with environmental and water institutions. However, in the Multipurpose Project, the negotiations with communities in the Batallas and Pucarani communities included demands beyond the scope of the project or the mandate of the MMAyA, requiring the involvement of other ministries and agencies. Having an interinstitutional mechanism as part of a project's organization could help raise the profile of the project among other institutions and facilitate the negotiations.

5.1.5 COMMUNITY INFLUENCE ON WATER GOVERNANCE

As described previously, community stakeholders have participated through various channels to raise their concerns and make demands within the context of the projects. As a result, they have helped shape IWRM and IRBM plans and measures. Under the Multipurpose Project, they have also negotiated additional compensation beyond water-related measures, and they contributed to defining the content of the women's empowerment subproject.



In addition, community members have influenced project design and implementation by sharing their knowledge. For example, in the Climate Resilience–IBM project, for the design of IRBM measures, local residents were hired to provide information on the area, such as where there have been landslides or where the main sites of water intake are located. During consultations, community members also proposed adjustments to IRBM measures based on their local expertise. For instance, in Rinconada, when presented with reforestation measures, community members highlighted the risks of insect infestation associated with certain tree species, and alternative species were picked instead.

Project implementers highlighted in interviews that the projects have also helped empower community members to engage with water management issues, by increasing their knowledge of the relevant institutions and of existing communication channels and institutional mechanisms. As a result, they said, community members are now better able to draw public officials’ attention to certain issues, make demands and suggestions with regard to water management, and hold them accountable.

In the Multipurpose Project, efforts are ongoing to create a coordinating mechanism, the Operation Technical Commission (COTEMU), which would bring together key stakeholders from the El Alto, Batallas and Pucarani municipalities, such as irrigators and farmers’ associations, municipal governments, women’s associations, and other groups. The COTEMU is meant to be institutionalized under the MMAyA and to become responsible for the administration,

operation, and maintenance of the systems built by the project. It would institutionalize agreements that have been negotiated in the project with regard to sharing water among different areas and sectors (e.g. water for irrigation or for human consumption).

The process of creating the COTEMU has been challenging, as territorial disagreements, factional politics, and historical distrust among stakeholders have slowed down the process. The wide disparities in living conditions and access to basic services between urban and rural areas play an important role in water politics (see Section 3.3). The Multipurpose Project thus illustrates how crucial it is to address underlying inequalities to improve water governance. Institutionalizing the COTEMU is an important step to ensure the long-term sustainability of the new infrastructure. Without an inclusive governance mechanism, water sharing agreements between El Alto and upstream communities will be more difficult to maintain or reach in the future, especially in times of drought, or may end up being negotiated between a few powerful actors only, leaving behind the rest of those affected.

Indeed, the COTEMU’s composition and way of operating may determine the long-term distributional impacts of the project and help shape social inclusion practices going forward. It will likely have broader implications for water governance in Bolivia, given that there are other large multipurpose projects being planned or implemented in the country, and their institutional arrangements are likely to be informed by the outcomes of the Multipurpose Project.

5.2 DISTRIBUTIONAL ISSUES

KEY INSIGHTS

- **Environmental and social safeguards:** Environmental and social safeguards tend to focus on the direct impacts of infrastructure development, making it difficult to identify risks associated with governance outputs (such as watershed plans), which extend across larger geographical or temporal scales, or to avoid maladaptation. However, the safeguards process has served to identify disadvantaged groups and target activities to them.
- **Political economy:** Addressing the complex political economy of water governance, including tensions between upstream and downstream water users, is crucial for projects' feasibility and sustainability. CIF's experience in the country highlights the importance of ensuring that projects recognize the influence that different actors have on decision making and the importance of including both influential groups and disadvantaged groups as direct beneficiaries. Disadvantaged groups should be involved in planning and decision-making, not just as compensation recipients. Another area that needs more attention is the potential for tensions between global decarbonization—which is driving growth in lithium and other mining in Bolivia—and communities' need for climate resilience.
- **Access to information:** Access to high-quality hydrometeorological data and climate information is essential to ensuring a fair allocation of water resources. The PPCR projects helped to improve data collection and built institutional capacities to interpret and use the data, but mainly at the national and departmental levels, though some municipalities have also benefited. A helpful next step would be to support the creation of climate services to make hydrometeorological data and climate information more accessible and useful to community members, and to further enhance capacity building at the municipal and community levels.
- **Project indicators:** Standard project indicators are ill-suited to assessing distributional impacts, as they typically focus too narrowly on quantifying the results of project activities within the project area. Assessing progress from a just transitions perspective requires a broader set of indicators to reflect both benefits and losses, disaggregated and also applied to groups beyond the project's immediate area of influence.

5.2.1 WHAT INSTITUTIONAL SAFEGUARDS CAN AND CANNOT ADDRESS

A key aspect of just transitions is to address not only the direct effects of climate change and climate action, but also the broader drivers of vulnerability—that is, the conditions that have resulted in people and communities being marginalized and disadvantaged in the first place. The PPCR projects provide important insights on how well institutional safeguards can address those underlying conditions.

The Multipurpose Project was categorized as a Category A project, and thus required an Environment and Social Impact Assessment (ESIA) as well as safeguards on access to information, the rights of Indigenous Peoples, and gender equality. For the ESIA alone, there were multiple consultations with beneficiaries and potential affected groups (see also Section 5.1).

Along with noise, air pollution, and other construction-related impacts, the ESIA found the projects would cause landscape changes, disturb soils, and alter sensitive ecosystems such as *bofedales*,¹⁶¹ also affecting fauna as a result. It also found that infrastructure work and the increase in the water level in reservoirs would cause both temporary and permanent impacts on private grazing lands (depending on the location) and electrified fences. The livestock producers and herders who are the main users of the area were thus identified as the most directly affected.¹⁶² In line with the project's environmental and social management plan, they are being compensated, monetarily or in kind.

The ESIA also determined which groups were generally most vulnerable in the project's area of influence: women, the elderly, and children in rural areas.¹⁶³ Based on that analysis, a subproject targeting working-age women was included under the drinking water component. It entails providing new infrastructure and machinery (greenhouse tents with irrigation systems and milk collection centers), supporting women's productive activities (such as growing and using vegetables, producing dairy products, designing and making clothes), and

capacity-building in basic accounting as well as leadership and public speaking. The greenhouse tents provide new jobs for women, and new local chapters of the women's farmers organization, the Central Agraria Bartolina Sisa, are also being established. In addition, adjustments were made to the environmental and social management plan to improve the distribution of the project's benefits. For instance, regarding the creation of temporary jobs, planting and reforestation activities will be contracted to women through local women's organizations.¹⁶⁴

The Multipurpose Project also has provided additional, indirect benefits to communities in Batallas and Pucarani municipalities, aiming to help address social inequalities in housing. During stakeholder negotiations over water resources, communities sought investments and measures that were beyond the scope of the project or even beyond the mandate of the MMAyA, such as investments in housing. The MMAyA has negotiated with other ministries and agencies to fulfill those community demands.

The Climate Resilience–IBM project also triggered institutional safeguards, including on natural habitats, forests, dam safety, physical cultural resources, pest management, and Indigenous Peoples. In anticipation of the development of IRBM plans and infrastructure investments, the World Bank developed an Indigenous Peoples Framework for its PPCR-related activities in Bolivia.¹⁶⁵ The framework provided guidelines to ensure that Indigenous Peoples were involved in planning activities and in subprojects. It highlighted potential benefits of subprojects, such as increased climate resilience and more equal participation in local governance, as well as potential negative impacts on food production or on Indigenous Peoples' spiritual connection to the land. The framework also established requirements for registering and addressing complaints, disseminating information, and carrying out consultations.

The World Bank also drafted guidelines on environmental and social impact assessment requirements for different types of infrastructure and measures to be financed by the Climate Resilience–IBM project.¹⁶⁶ A significant gap, however, is that the

scope and methodology of safeguards fail to capture the potential for maladaptation on a wider social scale. Maladaptation is a response to climate change that actually increases climate risks by shifting vulnerability to another place, time, or social group.¹⁶⁷ For example, building flood defenses may lead to worse disasters if it encourages the development of more infrastructure and buildings behind those structures without making adequate provisions for the possibility that the defenses might fail.¹⁶⁸ Similarly, creating embankments upstream may create greater risks downstream,¹⁶⁹ and expanding irrigation may decrease water availability for other purposes.¹⁷⁰ Building hard infrastructure can also limit the range of future adaptation options. A just transitions lens requires anticipating, monitoring, and minimizing maladaptation risks.

5.2.2 ADJUSTING PROJECT DESIGN TO THE POLITICAL ECONOMY CONTEXT

As described in Section 3.3, there are significant tensions among water users in Bolivia, in particular between upstream and downstream communities. The Multipurpose Project has taken into account the political economy of water in Bolivia. Expanding water access downstream in the El Alto area implies diverting water from other watersheds, and has thus required engaging with those watersheds' powerful associations of irrigators. The project thus included activities that directly benefit these associations. Recognizing that these activities would only benefit part of the population in the upstream municipalities—mainly farmers who own the land that is/will be irrigated—the project also included activities and investments targeting other (more vulnerable) groups, such as women, other farmers, livestock producers, and fish farmers. This design (see Figure 4) is essential for the project's political feasibility and differs from past approaches in the areas around El Alto and La Paz, in which water was redirected without compensation for impacts on upstream communities.

At the same time, the Multipurpose Project took a sectoral approach, starting from the objective to increase El Alto's water supply, then adding elements

to address to the political economy of water. As a result, even though communities have had some influence on the activities implemented (see Section 5.1.1), they have been involved primarily as beneficiaries of compensatory measures.

Another example of how the PPCR has incorporated key political economy issues relates to the development of the Rocha PDC in the Climate Resilience–IBM project. The process highlighted the high dependence on areas of “water reserves”—areas with a good level of ecosystem conservation and where there is currently no other water use. Recognizing their critical role for water supply in the watershed, the PDC suggests a proactive approach to avoid future conflicts over water use in these areas.

As noted in Section 3.3, the mining sector also has considerable influence on water governance in Bolivia. During the development of the PPCR, Bolivia’s Planning Ministry suggested the Pilcomayo watershed as one of the areas for the program to focus on. Pilcomayo has a lot of informal mining activity and significant water pollution from mining. However, the complex political economy around those activities led CIF to prioritize other watersheds for its pilots under the PPCR.¹⁷¹ That is understandable, but going forward it is crucial to address the relationship between mining and water governance. Mining-related water pollution increases downstream water users’ vulnerability by further limiting the clean water supply.

Mining requires particular attention in Bolivia because the global low-carbon transition is driving rapid growth in demand for minerals used in key technologies.¹⁷² Bolivia has the largest identified lithium resources in the world, about 21 million tonnes out of a global total of 89 million.¹⁷³ About three-quarters of global lithium production is used for batteries, and with the shift to electric vehicles, consumption is rising very quickly, reaching 93,000 tonnes in 2021, up by 33 percent from 2020 levels. Credit Suisse has projected that global demand could triple between 2020 and 2025.¹⁷⁴ Because more than half the world’s lithium is concentrated in the high Andes, where water is already scarce, and lithium mining is a very water-intensive process, supporting

global decarbonization could directly affect the water security of millions of vulnerable people.¹⁷⁵

5.2.3 BUILDING ADAPTIVE CAPACITY FROM THE LOCAL TO THE NATIONAL LEVEL THROUGH HIGH-QUALITY DATA AND INFORMATION

Reliable hydrometeorological data and climate information are crucial for fair and effective decision-making, as they provide clarity on current and future water availability, as well as water needs from people, nature, and economic activities. From a just transitions perspective, it is essential to improve the amount and quality of information available, and people’s capacity to use it, across all levels of government and within communities. Transparent and accessible climate-related information is also important for effective public participation and for holding decision-makers accountable (see Section 3.3).

The Climate Resilience–IBM project’s climate resilience component emphasized institutional capacity building. Its focus on the role of information systems, monitoring, and early warning systems has contributed substantially to improving Bolivian institutions’ adaptive capacity.¹⁷⁶ However, high turnover in those institutions has limited the long-term benefits of training public officials.

Although the main focus was on national and department-level institutions, the project has also improved capacities for hydrometeorological data collection and use at the municipal and community levels. For example, during the implementation of project, the SENAMHI, which is responsible for installing and operating hydrometeorological stations, encountered difficulties with the maintenance of some stations. In exchange for having municipalities maintain the stations, the SENAMHI agreed to provide them with technical assistance and hydrometeorological information.

In addition, through their MIC components, both the Multipurpose and Climate Resilience–IBM projects have implemented capacity-building programs to strengthen communities’ knowledge. They have also provided tools to enable them to better manage and



conserve the watersheds in the long term, taking into account the foreseen impacts of climate change. The Multipurpose Project includes capacity-building seminars on water conservation, soil protection, agriculture practices, irrigation systems maintenance, and ecosystem health monitoring, for instance. The goal is to improve communities' ability to interpret and use climate data and information, and thus enable more resilient planning and project design in the future.¹⁷⁷ Going forward, PPCR efforts to improve hydrometeorological information systems could be expanded to facilitate the development of climate services¹⁷⁸ that make climate data and scientific information accessible, easy to understand, and useful to local decision-makers and community members especially for the most vulnerable populations. Addressing this gap would contribute to strengthening adaptive capacity.¹⁷⁹

5.2.4 ASSESSING THE DISTRIBUTIONAL IMPACTS OF GOVERNANCE OUTPUTS

The PPCR projects have supported the development of water governance guidelines, plans, and communication and coordination mechanisms. They have also built institutional and community capacities and reinforced IWRM norms (see Section 2.2.1). A just transitions approach requires assessing the distributional impacts of those governance outputs and outcomes—and that can be challenging.

For guidelines, PDCs, and IRBM plans in particular, the distributional impacts depend to a great extent

on how they are implemented. While projects are designed to support the delivery of such plans, challenges can arise in implementation requiring adaptive measures that can affect the distribution of gains. For example, in the Climate Resilience–IBM project, reallocated resources away from the non-structural measures envisioned towards physical infrastructure¹⁸⁰ in response to concerns about security (for example, controlling water flows through structures such as dikes and walls to avoid floods, rather than improving vegetation cover) and income generation.

Another key issue is that the standard indicators used in monitoring and evaluation systems for projects such as those funded by the PPCR do not enable a detailed analysis of distributional impacts.¹⁸¹ For example, the key indicators for the Multipurpose Project are the number of households with better access to potable water, including the number of Indigenous households in the Batallas and Pucarani municipalities, and the number of farmers with access to better irrigation services. These are valid but, as is the case with most development projects, focus narrowly on the project's main objectives and target groups, even though some benefits actually extend beyond project boundaries.

In order to better assess projects' contributions to just transitions, a broader set of indicators, with further disaggregation by affected groups, could help better capture benefits and losses generated both within and beyond the project's immediate area of influence.

5.3 TRANSFORMATIONAL INTENT

KEY INSIGHTS

- **Targeting underlying inequalities and barriers to social inclusion:** Achieving just transitions requires not only compensating those who are affected directly by transition policies and projects, but also addressing structural inequalities that perpetuate poverty, marginalization, and vulnerability. Tailoring subprojects to the needs of vulnerable groups, such as the women’s empowerment project under the Multipurpose project, may contribute to transformational change if they tackle not only unequal outcomes, but also their drivers (for instance, by strengthening women’s capacity to organize and participate in decision-making spaces). However, significant scaling up would be needed to transform Bolivia’s water governance.
- **New norms and practices:** Shifting from a sectoral to an integrated approach in water management is one of the key challenges in Bolivia. The PPCR projects have fostered a strategic and integrated water management approach through the development of climate resilience guidelines and hydrometeorological information systems. Many challenges remain to operationalize integrated water management practices that are truly multisectoral and inclusive.

As discussed in Section 3.3, most transitions work within existing structures, making only incremental changes, but transformation will often require targeting the underlying structures to tackle the root causes of vulnerability and environmental degradation.¹⁸² The challenges encountered by the PPCR projects have highlighted how closely the disparities in water access, the precarity of rural livelihoods, and the political economy of water allocation are tied to poverty, inequality, and marginalization. In the context of the PPCR projects, we asked three questions:

- 1 | How is the transition window being used to address existing inequality, vulnerability, and marginalization, and to transform underlying environmental, social, and economic systems?
- 2 | How do the PPCR projects challenge the structural barriers to social inclusion in water-related decision-making?
- 3 | How are PPCR projects setting up new norms and practices that strengthen climate resilience and integrated water management?

5.3.1 ADDRESSING THE ROOT CAUSES OF INEQUALITY AND VULNERABILITY

The PPCR projects are directly contributing to addressing inequalities in the outcomes of water governance. The Multipurpose Project is expanding access to drinking water in El Alto and in rural communities in the Batallas municipality; reducing the vulnerability of rural populations whose livelihoods depend on rainfed agriculture; and improving food security and income opportunities for women in four communities. The Climate Resilience–IBM Project is also benefiting low-income communities, having near-term impacts mainly through its infrastructure and MIC components, which are contributing to improving livelihoods and productive opportunities in three watersheds of the Rio Grande Basin.

The PPCR projects’ emphasis on improving the livelihoods of vulnerable groups helps reduce outcome inequalities, but it was not designed to directly address the structural causes of those inequalities. However, other aspects of the PPCR projects have helped reduce information gaps and asymmetries that had contributed to perpetuating inequalities. For instance, they have improved hydrometeorological information systems and strengthened capacities to use that information, not only at the national level, but also at the local

government level and, to some extent, within communities. This is an important first step to avoid unjust water management decisions due to information gaps.

As highlighted by the water challenges around mining, however, the dynamics of water governance within Bolivia are inextricably linked to influences beyond its borders. While the individual projects can contribute to transformation on a smaller scale, through project-level demonstration and scaling up of new solutions, broader changes in national and international norms, policies, and regulations are needed.

5.3.2 CHALLENGING STRUCTURAL BARRIERS TO SOCIAL INCLUSION

The PPCR projects have the potential to help reduce structural barriers in water-related decision-making—for instance, by building community members’ capacities to use existing and new participation channels. For example, the inclusion of activities to strengthen a local chapter of the Bartolina Sisa association in the Multipurpose Project holds potential to empower women politically and strengthen their voice in resource governance. While there have been obstacles to the full implementation of participatory methods for PDC development in the Climate Resilience–IBM project, the methodological design shows the potential for more inclusive water governance processes. The PPCR projects are pilots, so these elements would require considerable scaling up to have a transformational impact on Bolivia’s water governance processes.

5.3.3 SETTING UP NEW NORMS AND PRACTICES

Shifting from a sectoral to an integrated approach in water management is one of the key challenges in Bolivia. To ensure that water resources are shared equitably and not overexploited, there is a need for inclusive spaces and proposals for improving access to quality water that account for the diversity of water users (including the environment itself) and the potential impacts of climate change and climate action on the water cycle.

The PPCR projects have fostered a strategic and integrated water management approach through the development of climate resilience guidelines and hydrometeorological information systems. They have also helped key stakeholders, from the local to the national level, achieve a shared vision for each watershed. And they have supported the development of institutional arrangements and tools that enable multi-level learning processes (such as planning platforms and guidelines, as well as hydrometeorological information systems), a key element of transformational change and adaptive capacity.¹⁸³

The programmatic approach has also enabled the involvement of a wide range of societal actors, from government leaders and public officials at the national and subnational levels, to civil society, Indigenous Peoples, and local communities. It helped to identify non-water factors that affect water demand and vulnerability around water scarcity, and to start addressing them by bringing in other government agencies to address basic rural development needs, or by supporting rural livelihoods diversification. Nevertheless, many challenges remain to operationalize integrated water management practices that are truly multisectoral and inclusive, such as overlapping, conflicting, or missing institutional arrangements, and resource limitations within institutions as well as in communities.



6. INSIGHTS AND OPPORTUNITIES

The PPCR projects provide valuable insights about the challenges and opportunities that arise in water sector transitions. This section distills those insights and provides recommendations for CIF, the multilateral development banks (MDBs), and other development partners aiming to support just transitions to sustainable water governance in a changing climate, in Bolivia and beyond:

Embrace an integrated, holistic approach to policy making across sectors and governance scales.

Effective water resource management requires understanding and addressing trade-offs among water uses and users and tackling the structural drivers of water-related inequalities. That is only possible by working across sectors and levels of governance. Such coordination is especially important as irrigation expands to improve agricultural resilience and productivity, and demand increases for domestic water consumption, mining, energy, and other uses—

even as climate change makes water supplies less reliable. Moreover, taking an integrated approach is not only important at the planning stage, but also during the implementation. Here, the typical length of MIC projects makes it difficult to do it effectively.

An essential input for integrated water policy making is having a better picture of the cumulative implications of increased water demand resulting from national sectoral policies, in particular from agriculture, drinking water, energy, industry and environmental sectors and how such demand can be met in a changing climate. The development of PDCs and past subnational modelling exercises provide some initial indications on this,¹⁸⁴ but as highlighted in the National Development Plan, it is necessary to develop assessments of long-term water management for integrated development planning.¹⁸⁵

At the watershed level, water authorities need to bring together a wide range of stakeholders in watershed management planning and ensure that the results are

reflected in relevant sectoral, subnational, and local plans. In Bolivia, that means incorporating measures from the IRBM plans and PDCs into local development plans (*Planes Territoriales de Desarrollo Integral*) to ensure their implementation. At the national level, ensuring just transitions requires better coordination across line ministries and other sectoral agencies and a more integrated approach to water-related development strategies. Such an approach would help decision-makers understand the broader implications of potential policies and investments in any one sector—from expanding irrigation, to developing new mines, to significantly scaling up hydropower.

Another key aspect of a holistic approach is to adopt legal and institutional reforms to operationalize water rights. The Bolivian Constitution asserts the people’s right to access water, the people’s right to nature, and nature’s right to water, and prioritizes water for life. Putting those principles into practice would enable Bolivia to achieve a healthy and thriving environment and ensure universal access to water and its fair distribution. Legal and institutional arrangements are needed to establish how to allocate water equitably among sectors and how to ensure meaningful societal participation in allocation decisions.

Anticipate and address the distributional impacts of policies, projects, and investments, including internationally funded projects.

A just transition relies on understanding how risks, losses, and benefits will be spread across society, geographically, and over time. This is true even for actions that are meant to reduce climate risks, as without careful design, they could unintentionally worsen or redistribute risks, or even create new sources of vulnerability.¹⁸⁶ It is thus important to incorporate robust procedures to anticipate and address distributional effects upfront, with appropriate indicators for monitoring and evaluation during and after implementation. Existing safeguard procedures and monitoring, evaluation, and learning frameworks do not provide sufficient tools to reflect critically on projects’ distributional impacts.

Project indicators tend to relate to outputs (e.g. in the PPCR, number of new water connections, or of farmers trained in irrigation use) and focus only on direct beneficiaries. This means they do not typically shed light on broader societal impacts, or on how benefits and burdens are allocated among societal groups, or across geographies and time. Safeguards, meanwhile, tend to focus on identifying and compensating for direct negative impacts of infrastructure development (even if, through engagement and consultation processes, they gather a broader range of information). Different indicators and broader impact assessment procedures to identify or address the distributional implications of governance outputs, such as new policy guidelines, plans, and institutional arrangements, are needed for all projects that seek to support just transitions.

The case of the Rocha PDC also highlights some limitations with the PDC approach, which focuses entirely on individual watersheds. Although watershed-scale resource management is considered good practice, it does not enable an analysis of the implications of large water transfers between watersheds. In Bolivia, that leaves a significant gap if the watershed(s) from which transfers are being considered have not been prioritized in the PNC. From a just transitions perspective, it is crucial that the implications of such transfers are identified and that those affected participate in decision-making.

Identify and address fundamental inequalities and their drivers.

Achieving just transitions requires not only compensating those who are affected directly by transition policies and projects, but also addressing structural inequalities that perpetuate poverty, marginalization, and vulnerability. A holistic, cross-sectoral approach is a key part of that; the Multipurpose Project showed, for example, that gaining community support for a sustainable water governance agreement may depend on whether development gaps unrelated to water are addressed in marginalized areas.

Here, MIC projects under the Multipurpose Project have enabled the project to provide benefits to the population that does not benefit from drinking water and irrigation-related activities. Tailoring subprojects to the needs of vulnerable groups, such as the women’s empowerment project under the Multipurpose Project, may contribute to transformational change if they tackle not only unequal outcomes, but also their drivers (for instance, by strengthening women’s capacity to organize and participate in decision-making spaces). However, to enable just transitions, projects need to address the underlying drivers of marginalization more systematically.

It is important that climate adaptation projects (including internationally funded projects) be selected and designed with a clear understanding of the local political economy, including an analysis of the historical processes and institutional mechanisms of marginalization. This means not only identifying and acknowledging which groups are marginalized (for instance, women or Indigenous Peoples), but also how and why those groups are marginalized and take concrete steps to address the historical legacy of inequalities and marginalization.

At the same time, projects need to take care not to unintentionally reinforce systemic inequalities. This means removing administrative obstacles to working with and specifically benefiting marginalized groups, such as co-funding requirements (as illustrated by the Climate Resilience–IBM project) or funders’ preference for sites that have a high capacity for capital absorption, are relatively easy to access, and have hosted aid activities before.¹⁸⁷

Build adaptive capacity through enhanced access to data and climate information.

Improving hydrometeorological data and climate information systems—and ensuring good access to them at all levels, from the national government to local institutions and communities—can contribute to better and more equitable decision-making about the allocation of water resources. It is also crucial for enabling more meaningful community participation in water governance. The PPCR projects have included capacity building within national and subnational institutions (and, to a lesser extent, at the community level). This has already increased public officials’ capacity to produce, interpret, and use hydrometeorological information, although strategies are needed to reduce high staff turnover.

Transparency is crucial, too, as it broadens access to necessary information to contribute to water-related decision-making and can thus encourage more inclusive and participatory water governance.¹⁸⁸ It is also an important tool for holding governments, companies, and other actors accountable. A potential area for future improvement is to invest in the development of climate services tailored to the needs of farmers and other vulnerable community members, both to empower them in the context of water governance, and to increase their resilience to climate change impacts on water supplies.

Recognize and incorporate Indigenous and local knowledge.

Just transition challenges vary greatly across and within countries. Projects that aim to support just transitions therefore need to draw on local knowledge to understand the social, economic, cultural, and political context and to empower people to help shape plans in accordance with their interests, values, and aspirations. This means learning from municipal government officials, leaders of local organizations, and, crucially, from members of marginalized groups whose voices may not be heard unless they are sought out. Not only can they help projects develop more effective solutions, but they have important

insights to share on the potential benefits and costs of a transition, and how to mitigate or avoid negative impacts.

The people of the Andes know the land well and are keenly aware of changes in the climate and in water availability. They also know how those changes affect their lives and livelihoods, and they may have well-tested strategies for adapting to or coping with adverse conditions. Moreover, they can help fill information gaps, such as when there are not enough hydrometeorological stations to collect relevant data. However, top-down planning and decision-making processes tend to rely mainly, if not exclusively, on data and the insights of experts and public officials. Supporting just transitions requires recognizing and building on a much broader range of knowledge sources. Going forward, it is important to find creative and robust ways to combine climate data and traditional and local knowledge. The field of climate services can be instructive in this regard, as there are widely used participatory approaches that incorporate scientific research and hydrometeorological and climate models with local and Indigenous knowledge.¹⁸⁹ Developing climate early warning systems and diffusing climate information through alternative channels could contribute here as well.

Decisions about water governance and climate adaptation are inherently political,¹⁹⁰ and the choice of information used to shape those decisions can reproduce or worsen existing inequalities. Knowledge relevant to water and climate adaptation governance also exists at different scales.¹⁹¹ For instance, municipal officials are likely to know far more about local dynamics regarding water demand, and farmers may know best when different crops need the most water, or which varieties are most resilient. Rather than a purely top-down and technocratic approach, supporting just transitions thus requires creating inclusive spaces where different kinds of information and knowledge are recognized, and where actors with distinct interests and perspectives can then negotiate and reach agreement.¹⁹²

Sustain stakeholder engagement, particularly by marginalized groups, through all stages of a project.

As the PPCR projects illustrate, there can be a wide range of spaces and channels for societal participation at different stages of projects and policy processes. From a just transitions perspective, it is important that stakeholders be able to participate meaningfully all along the process, from framing the issues and priorities that need addressing, to policy and project design, to implementation, monitoring, and evaluation. This means going well beyond typical approach of having consultations at the outset of a project, and/or through institutional safeguards (which themselves have clear limitations regarding social inclusion, as discussed in Section 5.1.2), to create spaces for sustained engagement. This may also require providing extra resources to enable marginalized groups to keep participating along the project.

In the Climate Resilience–IBM project, the pandemic and other barriers limited the participation of the social councils in the development of watershed plans. Going forward, ensuring the engagement of the social councils will be an important step to support just transitions. If formal spaces do not allow for meaningful social participation, there will be more risks that such participation moves to informal spaces, such as protests and blockades, thus generating resistance and delays.

In parallel to improving participation spaces and channels, enhancing the participation of marginalized groups also requires capacity building (including access to data and information and training on how to use them, as noted above). Other measures may also be needed, such as transportation assistance, to support the continued involvement of marginalized groups and enable them to be vocal and hold authorities accountable. At the same time, there is a need for participation processes to recognize, consider, and learn from the experience and expertise that such groups bring to the table.

Empowering local communities can also reduce the risk that interventions will be captured by national elites, or that top-down policies and projects will hinder local efforts to adapt to climate change¹⁹³ and to adjust to socioeconomic shifts.¹⁹⁴ In the Bolivian context, strengthening capacities at the subnational levels is also key for fully implementing the decentralization process enshrined in the Constitution. Nevertheless, local organizations can pose their own elite capture risks and do not necessarily speak for all people.

Projects aiming to support just transitions thus need to ensure that local communities are front and center in identifying and framing issues and proposing responses—and then support them in the implementation of such responses. (This does not mean, of course, that the broader context should be ignored—it is important to consider the full implications of choices in one location, or even within a watershed, to avoid generating trade-offs elsewhere.) Local communities will also play a key role in implementing just transition plans and projects, so building local ownership is crucial. Such an approach implies a deeper and longer engagement than is typical of internationally funded projects, but it also has the potential to increase their long-term sustainability.

Identify and tackle trade-offs between climate mitigation and adaptation measures.

The case of water governance in Bolivia illustrates how the choices about energy systems and decarbonization made in Bolivia—most notably, the shift from gas-fired power plants to hydropower—and globally, driving up demand for lithium and other materials, can affect access to clean water in parts of the country. For example, Bolivia’s NDC mentions plans to develop and take advantage of the country’s potential in lithium and biofuels.¹⁹⁵ The extractive industries sector plays a key role in generating revenues and in funding social programs in Bolivia, so it has become a core pillar of its development strategy. However, the sector is also a key contributor to water inequalities in Bolivia.

A just transitions approach will require greater efforts to assess and skillfully handle the risks and opportunities associated with the anticipated increase in demand for minerals and other natural resources (such as biofuels), and to distribute fairly the associated benefits and costs. This entails much stronger institutions and norms to protect the environment, as well as workers and communities’ safety, health, participation, and human and labor rights.¹⁹⁶ New mining technologies (such as direct lithium extraction¹⁹⁷) may also help reduce water use, but this alone is insufficient to address the sector’s social and environmental issues.

At the same time, there are also synergies to harness between climate mitigation and adaptation. Using solar-powered irrigation systems, for instance, could support expanding irrigated agriculture in remote areas without increasing greenhouse gas emissions. Finding and taking advantage of the synergies, while also identifying and mitigating trade-offs, is essential for just transitions.



7. CONCLUSION

Climate change mitigation and adaptation both require shifts in how we use and govern water and other natural resources. Those shifts will bring benefits, but also impose costs, and both need to be distributed fairly in order for the transition to be morally legitimate and politically feasible. Adopting a just transitions approach in climate and sustainable development projects can help ensure that future investments produce more just outcomes, supported by more socially inclusive governance processes.

This case study highlights some of the challenges and opportunities that arise from climate adaptation and water management processes. Over the past decades, Bolivia has undertaken a process of transformation of its water governance by promoting a more integrated and socially inclusive approach to water management. It has also taken a more proactive approach to anticipate and mitigate water-related conflicts. Nevertheless, water remains highly politicized, and water-related conflicts are still widespread. Historical social inequalities and incomplete legal and institutional frameworks are two key factors behind the current situation.

Against this background, supporting just transitions requires tackling several issues as the country implements new water policies and programs,

including addressing disparities in access to water for agriculture and household use, and strengthening the participation of marginalized groups in water governance. Moreover, as the case study highlights, it is essential to identify and address trade-offs between climate mitigation and adaptation measures. For example, global low-carbon transitions can put strong pressures on local water systems through growing demand for minerals and crops. Here, resource efficiency improvements and stronger social and environmental protections could help avoid unjust outcomes at the local level.

At the same time, significant opportunities exist to address these challenges. For instance, the Bolivian Constitution and the 2012 Framework Law of Mother Earth and Integral Development for Living Well recognize third-generation human rights and Indigenous rights and establish the basis for more sustainable management of resources from an environmental and social perspective. Leveraging these opportunities will require further developing legal and institutional arrangements to put those principles into practice, and designing future climate and development projects to explicitly address distributional impacts, promote social inclusion, and support further transformational change to ensure just transitions.

ACRONYMS AND ABBREVIATIONS

COTEMU	Multipurpose Project Technical Commission (<i>Comisión Técnica del Proyecto Multipropósito</i>)
EMAGUA	Environment and Water Executing Agency (<i>Entidad Ejecutora de Medio Ambiente y Agua</i>)
EPSA	Drinking Water and Sanitation Service Providing Public Entity (<i>Entidad Prestadora de Servicios de Agua Potable y Alcantarillado Sanitario</i>)
ESIA	Environmental and social impact assessment
FPS	National Fund for Productive and Social Investment (<i>Fondo Nacional de Inversión Productiva y Social</i>)
IDB	Inter-American Development Bank
IRBM	Integrated river basin management
IWRM	Integrated water resources management
MMAyA	Ministry of Environment and Water (<i>Ministerio de Medio Ambiente y Agua</i>)
MIC	(Non-structural) integrated water basin management projects (<i>Proyectos de Manejo Integral de Cuenca</i>)
NDC	Nationally determined contribution
PDC	Watershed Master Plan (<i>Plan Director de Cuencas</i>)
PNC	National Watersheds Plan (<i>Plan Nacional de Cuencas</i>)
PPCR	Pilot Program for Climate Resilience
SDC	Secretariat for River Basin Planning in Cochabamba (<i>Servicio Departamental de Cuencas</i>)
SENAMHI	National Service of Meteorology and Hydrology (<i>Servicio Nacional de Meteorología e Hidrología</i>)

ENDNOTES

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- 8 See climate projections for 2040–2059 under different climate scenarios (CMIP6) on the World Bank's Climate Change Knowledge Portal: <https://climateknowledgeportal.worldbank.org/country/bolivia/climate-data-projections>. Note that these are averages across models; it is also important to note that historical data are limited, and so are detailed projections for Bolivia. A widely cited study using older modeling data found that by the 2050s, temperatures in the Bolivian Andes could be 2.7–3.2°C warmer than the 1950–2000 mean. See Rangecroft, S. et al. 2016. "Future Climate Warming and Changes to Mountain Permafrost in the Bolivian Andes." *Climatic Change* 137 (1): 231–43. doi:10.1007/s10584-016-1655-8. For a more recent analysis (considering results from CMIP3 and CMIP5 model runs), see Pabón-Caicedo, J.D. et al. 2020. "Observed and Projected Hydroclimate Changes in the Andes." *Frontiers in Earth Science* 8. <https://www.frontiersin.org/articles/10.3389/feart.2020.00061>.
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THE CLIMATE INVESTMENT FUNDS

c/o The World Bank Group
1818 H Street NW, Washington, D.C. 20433 USA

Telephone: +1 (202) 458-1801
Internet: www.climateinvestmentfunds.org



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