Project Information Document (PID)

Appraisal Stage | Date Prepared/Updated: 12-Dec-2023 | Report No: PIDIA00328

BASIC INFORMATION

A. Basic Project Data

Project Beneficiary(ies)	Region	Operation ID	Operation Name
Bolivia	LATIN AMERICA AND CARIBBEAN	P178861	Bolivia Resilient Water Management for Community and Household Irrigation Project
Financing Instrument	**Estimated Appraisal Date**	**Estimated Approval Date**	**Practice Area (Lead)**
Investment Project Financing (IPF)	27-Nov-2023	20-Feb-2024	Water
Borrower(s)	**Implementing Agency**		
Plurinational State of Bolivia	Viceministerio de Recursos Hidricos y Riego (VRHyR), Ministerio de Medio Ambiente y Agua (MMAyA)		

Proposed Development Objective(s)

To improve integrated water resources management in water stressed basins and increase the resilience to climate variability of vulnerable rural families in selected micro basins.

Components

Component 1. Water resources planning and pre-investment studies.
Component 2. Climate resilient infrastructure investments.
Component 3: Capacity building for water governance and enhanced productivity.
Component 4. Project management.

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)?	No
Is this project Private Capital Enabling (PCE)?	No

SUMMARY

Total Operation Cost	**174.20**
Total Financing	**174.20**

of which IBRD/IDA	**150.00**
Financing Gap	**0.00**

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	150.00

Non-World Bank Group Financing

Counterpart Funding	24.20
Borrower/Recipient	24.20

Environmental And Social Risk Classification

Substantial

Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

B. Introduction and Context

Country Context

1. **Bolivia has made remarkable economic and social progress over the past twenty years.** Between 2006 and 2014, Bolivia's economy grew at an average rate of 5.1 percent per year in real terms due to a rapid increase in public investment and social spending.[1] Consequently, Bolivia experienced one of the region's largest reductions in poverty and inequality. Between 2002 and 2014, the national poverty rate declined from 63 percent to 39 percent, extreme poverty from 39 percent to 17 percent, and the Gini coefficient from 0.60 to 0.48, while the population increased from 8 to 11 million.[2] Economic and social progress continued from 2014 to 2018, albeit at a slower rate following the collapse of oil prices in

[1] Growth, unemployment, and inflation rates come from the National Statistics Institute.
[2] National poverty rates and Gini coefficients come from official figures from the National Statistics Institute, and population figures come from the World Development Indicators.

late 2014 and the end of the global commodities boom.[3] To sustain economic growth in a less favorable external context, Bolivia has maintained high levels of public investment and social spending in line with the Government's state-led development model, alongside measures to grow domestic credit. This spending was financed, partially, by increased public debt and a drawdown on fiscal savings and international reserves. Nevertheless, despite the strong record of social progress, Bolivia remains one of the poorest countries in the region, with a relevant number of poor households still to gain access to critical basic services such as affordable electricity, digital connectivity, and sewage services.

2. **The economy is gradually recovering from the 2020 COVID-induced recession.** The pandemic hit Bolivia hard; the economy contracted by 8.7 percent in 2020, and there was a temporary, increase in poverty and inequality and a more protracted increase in informality. Growth recovered to 6.1 percent in 2021 and 3.5 percent in 2022, thanks to improving external conditions, easing mobility restrictions, and a recovery in public investment. Annual inflation remained at a low of 1.7 percent in December 2022, contained by a fixed exchange rate, subsidized fuel prices, and other price controls. The Government has refinanced the bulk of bonds due in 2022 and 2023, reducing rollover risks in the short term. Yet, possible limited access to funding in increasingly constrained international markets, declining gas exports, and weak private investment could limit growth in the medium term.

3. **Although poverty has declined after the pandemic-induced peak, some population segments have not made up for the lost ground, and important service delivery gaps remain to be closed.** In 2021, poverty fell below its pre-pandemic levels, the middle class rebounded, and income inequality declined. Measured under the international poverty line of $6.85 a day (2017 PPP), the poverty rate, in 2021 was 15.2 percent, down from 17.3 percent in 2020 and 15.5 percent in 2019.[4] Still, poverty remains particularly high in rural areas (32 percent), among indigenous people (22 percent), and children under 14 years of age (23 percent). Urban unemployment also declined from a peak of 11.6 percent in July 2020 to pre-pandemic levels of 4.5 percent in December 2022, but there has been a rise in informality amidst slower employment growth and lower labor force participation. Higher food inflation following the end of pandemic-related emergency cash transfers has impacted households' purchasing power; it is estimated that monetary poverty could have increased to 16.9 percent in 2022.[5]

4. **The 2021-25 National Development Plan of Bolivia (PDES) reflects the Bolivian Government's current development priorities.** The PDES (framed in the context of Bolivia's ten-year Patriot Agenda 2015–2025) seeks to restore the economy through a Social Community Productive Economic model, which focuses on growth through internal demand facilitated by public investment. The PDES outlines policy objectives and indicators under ten strategic pillars (Figure 1).

[3] World Bank. 2021. Rebalancing Inclusive and Sustainable Growth to Continue Reducing Poverty in Bolivia: Systematic Country Diagnostic Update.
[4] Poverty figures estimates based on the international poverty lines come from the Socio-Economic Database for Latin America and the Caribbean.
[5] World Bank's staff estimates.

Figure 1: Strategic Pillars of Bolivia's Economic and Social Development Plan, 2021–2025

5.Bolivia is experiencing greater climate variability and more extreme climatic events. The 2019 Global Climate Risk Index (CRI) ranks Bolivia 10th out of 178 countries in terms of the impacts of climate-related hazards. The most catastrophic disasters, including floods, droughts, and landslides, accounted for US$3.1 billion in damages over a 35-year period (1982–2016)—an average of US$91.1 million per year. These events, which are influenced by El Niño (the El Niño Southern Oscillation, ENSO), have been exacerbated by climate change, triggering increasingly intense rainfall, landslides, floods, and droughts over the last decade.[6] In the country's Amazonian lowlands, flooding has become more frequent and its effects increasingly widespread; from 2013 to 2014, floods caused estimated losses of US$450 million and affected 44,000 households in 113 municipalities (World Bank, 2017). In turn, Bolivia's Altiplano, inter-Andean Valleys and Chaco regions have experienced increasingly intense droughts. In 2016, Bolivia experienced one of its worst droughts, which affected almost half the country's municipalities, reaching seven different departments. Increasing temperatures have also reduced the presence of water-storing mountain glaciers. Throughout the last 50 years, the country has lost approximately half of its surface area of mountain glaciers. Projected increases in temperatures and rainfall during the rainy season will further expose the country to more prolonged dry periods and an increase in the frequency and magnitude of floods, landslides, and other weather-related events.[7]

Sectoral and Institutional Context

Sectoral Context

6. In addition to the impact of climatic events, territorial and seasonal disparities have brought water security issues to the forefront. Water plays a central and cross-cutting role in Bolivia's economic, social, and environmental development. Agriculture and hydropower are key to economic development, water supply and sanitation services (WSS) to health and social development, and the conservation of ecosystems and forests to environmental development. Although Bolivia boasts 29,000 m^3 of water per inhabitant/year, significantly above the world average of 19,248 m^3/inhabitant/year,[8] the temporal and geographic distribution of water resources throughout the country is highly uneven. Most of Bolivia's major urban areas and economic centers are located upstream along the macro-basin systems of the Del Plata and Amazon or in the endoreic basin of the Altiplano, and face increasing desertification.[9] Water stress is further amplified by: (i) the low quality of water due to untreated human, industrial and mining wastewater; (ii) deforestation in Bolivia's lowlands, which

[6] Cai et al., 2014
[7] World Bank 2013; WRI 2017
[8] FAO. 2016. AQUASTAT Database, Food and Agriculture Organization of the United Nations. Website accessed on: 02/12/2017. Note: Average estimate for Latin America includes all countries except the Caribbean.
[9] Around 77% of the Bolivia's population is living in degraded areas (IPCC, 2018).

has impacted water availability in the inter-Andean valleys; and (iii) land degradation in those valleys resulting from inadequate land-use and climate change. In addition, Bolivia faces extensive dry seasons between April and October, during which rainfall represents only about 0 to 15 percent of the annual total. Limited water management capacity has further aggravated water security issues across the country. Evapotranspiration accounts for the primary loss of precipitation inputs in key river basins, representing approximately 42 percent of losses in the Amazon, up to 75 percent in the Altiplano, and between 47 to 75 percent in the Del Plata. Consequently, annual runoff is estimated to be largest in the Amazon (679 mm), while it is much less in the Altiplano (70 mm) and variable in the Del Plata (70–414 mm) basin. For the three macro-basins, seasonal differences in runoff are evident, with more than 60 percent of runoff occurring during the wet season.[10]

7.Agriculture is an important sector in Bolivia, accounting for 12.9 percent of the Gross Development Product (GDP).[11] The agricultural sector, which includes forestry and fishing, had an annual growth of 5 percent between 2013 and 2018. The sector employs 31 percent of the active population. Irrigation is a determining factor for land productivity and poverty reduction in rural areas, stabilizing agricultural production, contributing to food security and climate resilience, increasing agricultural income, and generating employment.

8.Water availability is directly limiting agriculture, the principal economic activity in rural Bolivia. Farmers in the highlands and in the inter-Andean valleys rely on rainfed agriculture and utilize the short rainy season to produce crops, such as potatoes, maize, wheat, oat, beans, peas and onions, primarily for personal use and secondly for local markets. The highlands are most affected by climate variability and change, given the increasingly frequent occurrence of droughts that have negatively impacted crop yields. Although irrigation, which ensures production in the rainy season and, if conditions allow, for a second production cycle during the dry season, is a key method for coping with temporal rainfall variability, only 10 percent of cultivated land in Bolivia is under irrigation.[12] According to a 2010 dam inventory, Bolivia had 287 dams, 64 percent of which were categorized as small dams according to the International Commission of Large Dams (ICOLD) classification. The volume of total dammed water stands at roughly 596 million m^3. The majority of these dams (74 percent) provide water for irrigation. Some small and medium dams were built following a 2016 national drought with the main objective of ensuring drinking water for cities, such as the La Paz metropolitan region, while a few others are being constructed primarily to generate hydroelectric power and to support large irrigation schemes.

9.Recognizing the importance of irrigation for agricultural production, the Government of Bolivia (GoB) developed an ambitious plan, "Decade for Irrigation 2015-2025, Towards One Million Hectares Under Irrigation" to promote irrigation. From 2012 to 2017, the GoB invested roughly US$432 million (with its own funds and support from international partners) in irrigation, expanding coverage by an additional 83,236 hectares. However, most investments were targeted at traditional medium-sized irrigation systems. The average farm size in the highlands and inter-Andean regions, however, is less than three Ha, rendering traditional irrigation solutions impractical. Land fragmentation is most acute in the highlands, where 60 percent of farms span less than one Ha. Nevertheless, only 2 percent of investments made in the irrigation sector were directed towards household irrigation systems from 2012 to 2017. Despite limited investment,

[10] World Bank Group (WBG), Water and Climate Change in Bolivia - Background Paper to the Report on Economics of Climate Change Adaptation Bolivia. The World Bank, 2019.
[11] https://datos.bancomundial.org/indicator/NV.AGR.TOTL.ZS?locations=BO
[12] According to the latest irrigation inventory (2012), Bolivia has 5,669 irrigation systems, covering approximately 303,192 ha which represents approximately 10 percent of the total cultivated area.

small-scale household irrigation solutions have been successfully implemented in several rural development projects.[13] These solutions capture discharge from small springs or harvest surface runoff and are primarily used for supplementary irrigation of rainfed agriculture. Such small-scale interventions have allowed rural households to diversify their agricultural production and provide additional water for livestock and human consumption.[14]

Institutional Context

10.Bolivia's 2009 Political Constitution affirms the fundamental right to water (Article 373) and assigns the State a leading role in both the management of water resources (Article 374) and the provision of WSS services (Articles 298, 300, 302 and 304). The State must regulate, administer, and protect water resources to guarantee adequate and sustainable use of and access to water for all. The formulation of policies, planning and provision of basic services are established as exclusive responsibilities of the State at the different levels of government (national, departmental, and municipal). The Ministry of Environment and Water (MMAyA) is the lead governmental institution for environment and water in the country. The MMAyA's Vice Ministry of Water Resources and Irrigation (VRHR) is responsible for both policy formulation and providing guidelines for the regulation of irrigation and integrated basin management activities. The Ministry also encompasses decentralized entities, including the National Irrigation Service (*Servicio Nacional de Riego, SENARI*) and the Departmental Irrigation Services (*Servicios Departamentales de Riego, SEDERIs*), which are responsible for operating and updating the National Irrigation Information System, the National Register of Irrigation Systems, and the National Hydrological and Meteorological Service (*Servicio Nacional de Meteorología e Hidrología, SENAMHI*)**.** According to the Political Constitution there is a concurrent responsibility regarding irrigation and watershed protection between the national government and the autonomous territorial entities (ETA), which are the autonomous departmental governments and the autonomous municipal governments. This entails that the central level has the legislative responsibility, and the other levels have the regulatory and executive competencies.

11.There is a widespread consensus on the need for an updated legal framework for water management and service delivery in Bolivia.[15] Water legislation in Bolivia is based on numerous sectorial laws that assign different competencies to national and subnational institutions. Critical aspects for water security that are not adequately addressed under the current legal framework include: (i) unclear allocation of water resources among different users and lack of a competent authority to ensure equitable distribution, giving way to urban-rural conflicts over limited water resources as metropolitan areas grow and agriculture increasingly depends on irrigation; and (ii) the absence of operational basin management units (UGCs). A main pillar of Bolivia's strategy for water resources management is the development of Basin Master Plans for

[13] According to the inventory of irrigation systems of 2012, there are 1,618 micro-irrigation systems with less than 10 ha. irrigated, representing 28% of the total irrigation systems supporting livelihoods of 26,159 families (9% of the total families benefitting from irrigation).

[14] Studies to assess the impact of household irrigation were carried out by the Ministry of Environment and Water and the German Cooperation Agency (GIZ), which included: *Riego familiar en regiones secas de Bolivia: guía para su implementación (2016); Estudio de efectos diferenciados de los Proyectos Integrales de Cosecha de Agua (PICA) en la familia (2013); Evaluación de atajados en la Macroregión Valles (2012); and "Tres estudios de caso de Manejo Exitoso de Atajados en el Norte de Potosí y Sur de Cochabamba" (2010).*

[15] The current Water Law in Bolivia dates back to 1906. The Water Law includes provisions such as water as a public good and establish Bolivian government as main authority responsible for water management. The definition of water rights is vague, "the water passing through the land belongs to the landowner as long as it does not affect others." No provision is included for neither groundwater property rights nor water tariffs. The Water Law was minimally modified in 1945, to specify that "no water right includes the right to deny access to water to downstream water users."

prioritized river basins, which includes the creation of interinstitutional platforms as well as UGCs[16] to coordinate the development and implementation of the river basin plans and mediate between different, and frequently competing, user groups. These organizations are mainly consultative in nature and require additional legal power to enforce any norms; (iii) the high fragmentation of water service delivery, be it for human consumption or irrigation, which prevents taking advantage of economies of scale and hinders the work of the national regulator of water utilities to monitor service quality and provide technical assistance.[17] In the case of micro basins with areas of less than 250 km^2, the Basin Management Organizations (OGCs)[18] are created to represent the interest of water users. The OGCs are the key actors in the preparation and implementation of water infrastructure due to their ability to coordinate and mobilize the beneficiaries around a common objective, including compliance with counterpart commitments. The OGCs are usually created to implement an investment activity or subproject, but they are organized to work beyond a subproject's execution, ensuring the management of multiple uses of water and handling conflicts and complaints from different users and stakeholders.

12.Funding and management of minor irrigation systems. Municipal governments have exclusive jurisdiction in the implementation of micro-irrigation schemes, they can legislate, regulate, and implement them, However, the national government has the capacity of contracting loans to support the work of the municipal governments, develop investment policies and generate incentives for ETAs to implement these investments. To do so, each investment must have a co-financing agreement that sets forth the conditions of participation of each party. The operation and maintenance are the responsibility of community associations of users as minor irrigation systems are generally solutions for individual families or for small groups of families depending on the capacity of the water source. Technical assistance is usually provided to users associations in two phases: i) during the construction of the works to ensure that the beneficiaries carry out their counterpart activities in an appropriate manner and train the future users in the operation and maintenance of the schemes; and ii) during the commissioning and operation stage of the schemes with the aim of consolidating the users associations for the self-management and self-financing of the system, including the timing of water distribution, training for improving agricultural practices, alternative forms of association such as cooperatives, use of certified seeds, training on growing high-value products and ways to access markets, and the management of financial resources and their communal work for operation and maintenance. The training scope is defined based on variables such as the existing level of organization, climate, productive potential, access to markets, among others. The users' associations have a legal status and their water rights registered at the SEDERIs.

13.In June 2022, the MMAyA launched its new Plurinational Water Resources Management Plan 2021-2025, which

[16] Basin Management Unit (UGC) (*Unidad Gestora de Cuenca*). This is a technical body responsible to facilitate, articulate and technically coordinate the organizational units of the Basin Interinstitutional Platforms. These Platforms bring together public, private, and civil society stakeholders, to facilitate a participatory decision-making in the formulation, implementation, monitoring and evaluation of activities agreed within a basin water management plan. The Platforms are organized around three entities: political, social, and technical. The social entity is basically made up of the representatives of Basin Management Organizations (OGC), to ensure adequate and effective articulation between the strategic vision of the major basin and the visions of micro basins. The technical entity is the UGC, which is expected to provide technical advice to the stakeholders and receives financial support from Departmental Governments and international donors in some cases.

[17] Master Plans for Water Supply and Sanitation have been developed for the main cities but in most of the cases efforts for establishing a metropolitan entity have not been successful so far.

[18] Basin Management Organizations (OGC) (*Organismos de Gestión de Cuenca*). The OGCs are local, community bodies that identify and monitor the development of initiatives and local investments which are implemented within a basin water management plan. The OGCs are also active in following up the implementation of these initiatives as a means to developing management capacities at local level.

provides an integrated vision for the resilient and sustainable development of rural communities and includes: interventions in water management and related infrastructure; water governance at the national, macro, regional and micro-basins levels; irrigation; and risk management.[19] Furthermore, Bolivia's updated Nationally Determined Contribution (NDC)[20] identified water as a priority adaptation sector and highlighted the adoption of integrated water resources management (IWRM) in a multi sectoral and multilevel manner as official policy, recognizing watersheds as life systems and water management units. The National Plan for River Basins (*Plan Nacional de Cuencas – PNC*) served as Bolivia's main policy instrument for IWRM until 2020. While the focus of PNC I (2007-2012) centered on the protection of rural watersheds and agricultural water management, PNC II (2013-2020)[21] provided a more integrated approach by incorporating water quality, hydrological risks and climate change dimensions. While these policies represented important advances for IWRM, institutional and technical capacities as well as the legal framework for applying IWRM on the ground need to be further developed and strengthened.

14. Within the framework of this Plurinational Plan, the MMAyA has prepared the Bolivia Climate Smart and Resilient Program (*Programa por una Bolivia Climáticamente Inteligente y Resiliente*),[22] a comprehensive rural development program encompassing actions ranging from water conservation, irrigation and risk management investments to information, knowledge management and water governance activities. This national Program will support Bolivia's 2021-2025 National Development Plan (PDES), specifically Pillar 8, aimed at securing "a Sustainable and Balanced Environment in Harmony with Mother Earth," and Pillar 3, which focuses on "Food Security and Sovereignty, Value Added Export Promotion and Tourism Development." The GoB has requested World Bank support to implement the first phase of this Program through Investment Project Financing (IPF). The proposed US$174.2 million Project, which includes a counterpart contribution of US$24.2 million, will tackle water security challenges arising from climate change exacerbated flooding and droughts and build the resilience of families in vulnerable rural micro basins to the impacts of climate change.

C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

To improve integrated water resources management in water stressed basins and increase the resilience to climate variability of vulnerable rural families in selected micro basins.

Key Results

Achievement of the PDO will be measured through the following proposed indicators:

PDO 1: Improved integrated water resources management in water stressed basins

(a) Number of basins in water stressed regions with basin-level strategic integrated water plans (EPHIC) adopted.[23]

[19] MMAyA (2022): Plan Plurinacional para la Gestión Integral de Recursos Hídricos 2021-2025 (PPRH), issued on June 6, 2022.
[20] MMAyA (2022): Contribución Nacionalmente Determinada (CND) del Estado Plurinacional de Bolivia 2021-2030
[21] MMAyA (2017): Programa Plurianual de Gestión Integrada de Recursos Hídricos y Manejo Integral de Cuencas 2017-2020. https://www.mmaya.gob.bo/uploads/PNC-Programacio%CC%81nPlurianual2017-2020.pdf
[22] MMAyA/VRHR (2022): Programa por una Bolivia Climáticamente Inteligente y Resiliente. Program document.
[23] An approved EPHIC requires that a Basin Interinstitutional Platform has been established and a UGC has been set up with a Board of Directors and a Social Council appointed. Under the Project, it is expected that 9 EPHICs will be approved by the UGC's Board of

(b) Number of local water governance bodies (OGCs) operating[24] (disaggregating male/ female participation).

The first indicator can be regarded as a climate indicator for adaptation given that IWRM planning and risk management in water stressed basins will lessen the impacts of droughts and floods on residents.

PDO 2: Increased resilience to climate variability of vulnerable rural families in selected micro basins

(c) Area (ha) provided with new or improved irrigation or drainage services -corporate results indicator- (number).

(d) Area (ha) with integrated basin management (MHIC) interventions implemented and area (ha) protected with flood risk management interventions (number).

(e) Vulnerable families benefitting from climate resilience infrastructure interventions (number).

These indicators can also be regarded as climate indicators for adaptation and mitigation given that by investing in controlled irrigation systems and capacity building, farmers will avoid significant decreases in crop yields due to climate change and variability.

D. Project Description

15.The Project will have a strong focus on adaptation strategies for tackling the impacts of climate change on water security as well as developing resilience to climate change exacerbated flood and drought risks for Bolivia's poorest communities. The Project will adopt an integrated approach, from basin to micro-basin planning, and will include investments for water management at the micro-basin level, investments for hydrological risk management, as well as investments to secure adequate water for irrigation of rain-fed crops, increasing farmers' ability to improve food security and reducing their vulnerability to the increasing, climate change-induced rainfall variability.

16.Project design will consider some basic principles:

- A comprehensive analysis of needs at the basin level. Activities or subprojects to secure the availability and sustainable use of water resources for target areas will be identified through a comprehensive analysis of the needs of 15 targeted basins with areas between 2,000 to 20,000 km^2 and the development of EPHIC - formerly known as Basin Master Plans. These basins are managed by a UGC.

- Micro-basins as the basic geographic unit. Project interventions will target micro-basins spanning less than around 250 km^2 (operational hydrographic units), whose management units are OGCs. These micro-basins form part of larger basins managed by UGCs. Most of the micro-basins are located within the territory of one or a few autonomous municipal governments, thus facilitating coordination with the OGCs. In turn, larger basins that are managed by UGCs oftentimes extend beyond the boundaries of a single department and require the involvement of and closer coordination with the autonomous departmental governments and the MMAyA/VRHR. For activities under the VRHR's responsibilities and that are eligible for Project funding, pre-feasibility studies (Technical Reports on Preconditions, ITCPs) and detailed technical designs (Pre-investment Technical Design Studies, EDTPs) will be

Directors, and at least 6 will be approved through a legal instrument (either a Departmental Law or Ministerial Resolution issued by MMAyA).

[24] An operational local water governance body is defined as an OGC that is organized, has developed and is implementing a Local Management Plan. Being a community organization the OGCs don't receive external financial support and relay on the support of their communities.

prepared. In the case of activities that are not under the VRHR's responsibilities or are not eligible for financing under the Project, subproject profiles will be prepared to help stakeholders - municipal governments and community organizations such as OGCs - look for other funding sources.

- A bottom-up approach. The activities or subprojects will be identified and prioritized by the communities with the active participation of the municipal governments and the OGCs. A bottom-up approach will also be used for data collection in the field to build ownership and ensure that the communities are aware of the results of their work.

17.The Project will target micro-basins located in the departments of Chuquisaca, Cochabamba, La Paz, Oruro, Potosí, Santa Cruz and Tarija, which are mostly in the highlands and inter-Andean valleys. The geographic area comprises 197 municipal governments. Eligibility criteria for the selection of these basins included: (i) high aridity index, (ii) high levels of poverty, (iii) high population density, and (iv) potential areas of intervention under sub-components (2.1), (2.2) and (2.3) (see maps in Annex 3). The Project will sequence activities to focus initially on micro-basins that present high levels of need and high levels of readiness for implementation, tackling 'low-hanging fruit' quickly to demonstrate early successes in the first phase of the Bolivia Climate Smart and Resilient Program and inform the design of the following phases.

Project Components. The Project will comprise the following four components.

18.Component 1. Water resources planning and pre-investment studies (US$12.7 million financed by the IBRD). This component would fund activities that seek to address, respond to, and build capacity on present and anticipated impacts of climate change on water resources. The studies would have two objectives: (i) development of basin-level strategic integrated water plans (EPHIC) that follow both IWRM and integrated basin water management (MHIC) approaches. This task will involve the identification and analysis of the main challenges the basins face from a territorial and sectoral perspective, and the development of a strategic vision based on the sustainable use of water resources; and (ii) preparation of pre-investment studies and detailed engineering designs addressing climate change impacts for subprojects to be implemented in micro-basins, which will be related to water conservation, irrigation, and risk management infrastructure.

19.Component 2. Climate resilience infrastructure investments (US$146.0 million, of which US$121.8 million financed by the IBRD). This component will fund works and the supervision of investments related to water conservation, soil and land management, irrigation, and risk management to adapt to the impacts of and to build resilience against climate change exacerbated floods and droughts. The component will be divided into three sub-components.

- Subcomponent 2.1. Investments in integrated basin water management (MHIC). Investments will include activities to protect water sources, water planting and harvesting, soil improvement, protection of water recharge areas, forestation and recovery of forest areas, in drought prone areas. These investments will aim to reduce the vulnerability of watersheds facing degradation and desertification from floods and droughts, and to increase water availability and local storage capacity. The investments will also enhance soil and crop carbon stock hence mitigating climate change.
- Subcomponent 2.2: Community and household irrigation systems for improved sustainability and climate

resilience. Investments in household irrigation systems will include infrastructure for water capture (harvesting of surface runoff, capture of small spring water and other alternative water sources), installation of low energy family storage solutions, the conveyance of water to the field, and equipment necessary for water distribution on the plots. Investments in community irrigation systems will focus on the rehabilitation of existing minor irrigation systems to reduce water losses and energy intensity.

- Subcomponent 2.3: Risk management infrastructure to improve resilience. This subcomponent will support infrastructure to boost resilience to climate change impacts, protect land and communities against extreme hydrological events, including flooding, and to conserve, restore and manage soil degraded by erosion. Supported infrastructure would be designed in line with the Resilient Design Brief[25] against floods, droughts, and high winds where applicable in an energy-efficient and resource-efficient manner.

20.While works implemented under Component 2 should ideally be generated from subprojects developed under Component 1, the VRHR already has a portfolio of pre-investment studies and detailed technical designs that reflect the social demands of communities or municipalities located in the Project's target areas. A comprehensive approach has been agreed upon with the VRHR to screen these studies and designs, validate the demand from communities and municipal governments, and confirm their eligibility for funding under the Project. Irrigation investments could be accompanied by MHIC investments to secure the water balance. Hence, initial investment lots that consider technical design, economic viability and environmental and social aspects are already ready for implementation.

21.Component 3: Capacity building for water governance and enhanced productivity (US$10.7 million financed by the IBRD). This component will fund technical assistance (TA) and capacity building activities to enhance water governance at the national, macro, regional and basin levels including climate change education and awareness. The component will include the following activities*:* (i) the development of the School of Water Culture for Life; and (ii) TA and training for UGCs, OGCs, municipal governments, and farmers.

22.School of Water Culture for Life. The Project will finance the curricular design of this virtual school, including a course management platform and the structure of the curricula for the different target audiences. A diagnostic of capacities and identification of synergies with other institutions, including ongoing programs under the leadership of the Ministry of Education and national universities, will be undertaken.

23.TA and training. The component will finance TA and training for UGCs, OGCs, municipal staff and farmers aimed at strengthening local capacity on planning, implementation, and operation and maintenance (O&M) of the Project's infrastructure investments and improving and diversifying irrigated agricultural production. TA and training will be provided through consulting services. The VRHR has developed two TA and training programs, which will be implemented along the subprojects' implementation cycle, namely:

- Organizational Strengthening and Technical Assistance at the Basin Level (*Fortalecimiento Organizacional y Asistencia Técnica en Cuenca*, FORATC). To be carried out during the construction and operational phases of the infrastructure.
- Organizational Strengthening and Productive Technical Assistance (*Fortalecimiento Organizacional y Asistencia*

[25] https://openknowledge.worldbank.org/handle/10986/34448

Técnica Productiva, FORATP). This is a TA and training program on household and community irrigation systems and includes training on agricultural production. It will be provided to farmers for two years, spanning at least two complete production cycles, and will support farmers during the construction and operation of the irrigation infrastructure. The TA and training will include advice on agricultural production, efficient use of water, implementation of irrigation management plans, and a business plan for production, marketing and strengthening of producer associations.

24.Information and knowledge on climate, water resources and hydrological risks is limited and one of the main deficiencies undermining effective water resources management and proactive risk management in Bolivia.[26] [27] In parallel to the proposed Project, the Bank will provide TA through a recently approved Advisory Services and Analytics (ASA)[28] product funded mainly by the Global Water Security and Sanitation Partnership (GWSP), to support the development of tools to improve hydrometeorological monitoring.

25.Component 4. Project management (US$4.8 million financed by the IBRD). This component will fund activities to support Project administration and management, including procurement, financial, environmental, social, and technical management as well as audits and monitoring and evaluation (M&E).

26.Project Cost, Duration, and Financing. The estimated total Project cost is US$174.2 million, of which US$150 million will be financed with an IBRD loan. The Borrower will be the Plurinational State of Bolivia. The latter will be responsible for counterpart financing to cover the remaining US$24.2 million, which will be generated from cash or in-kind contributions from communities, municipalities, and departmental governments. The proposed lending instrument is an IPF to be implemented over a six-year period. The IPF was selected due to the instrument's flexibility and suitability to incorporate financing for infrastructure investments, studies, and capacity building. Project costs by component and

[26] The World Bank's analysis of the 2016 drought in Bolivia identified the lack of information on drought risks and a missing drought monitor and early warning systems as main reasons for the country's high drought vulnerability (World Bank, 2019).
[27] The MMAyA with SENAMHI, implemented several projects to strengthen the country's capacity in hydrological monitoring, including the development of a National Climate and Water Information System (*SNICA* for its acronyms in Spanish) which was supported by the World Bank within its Pilot Project on Climate Resilience (P129640).
[28] Mainstreaming climate resilience and promoting sustainable management of water resources and services in Bolivia, P179020.

financing arrangements are presented in Table 1.

Table 1. Project Costs and Source of Financing (amounts in US$ thousands)

Component	Project cost	IBRD Loan	Counterpart funding
Component 1. Water resources planning and pre-investment studies	12.7	12.7	0.0
Component 2. Climate resilient infrastructure investments	146.0	121.8	24.2
Component 3. Capacity building for water governance and enhanced productivity	10.7	10.7	0.0
Component 4. Project management	4.8	4.8	0.0
Total	174.20	150.0	24.2

Project Beneficiaries

27.The Project will directly benefit 70 organized rural communities or OGCs and 15 UGCs. At least 24,600 families in 82 micro-basins will benefit from water management and conservation interventions through the recovery of degraded areas, soil improvement, protection of water recharge areas, and recovery of forest areas (these activities will reach a total area of approximately 20,000 km^2). An estimated 10,500 small-scale subsistence farmers will benefit from the development of household and minor irrigation systems spanning a total area of approximately 5,625 ha. By adopting and improving sustainable irrigation schemes, subsistence farmers will be able to increase their productivity through irrigation systems that are more resilient to climate impacts. Furthermore, 5,250 families will benefit from the structural and non-structural works for the regulation and management of potential impacts caused by floods in 3,750 ha. In summary, the Project will benefit 40,350 families or 201,750 inhabitants. Staff from targeted municipal governments also stand to benefit from TA provided by the Project to strengthen their skills in monitoring subprojects throughout the full implementation cycle, including the post-construction phase.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Area OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

28.The Project's environmental risk is considered Moderate. During the due diligence of Project preparation, the VRHR had a technical, environmental, and social team from the UCP-PPCR and the UCEP-Mi Riego with whom the Bank team maintained continuous communication for the preparation of the draft Environmental and Social Management Framework (ESMF), the analysis of subprojects under the first portfolio that have technical designs, and the definition of

eligibility criteria and exclusion list for the second portfolio based on the scope of the first portfolio. Hence, the geographic area, the ecoregions of intervention, and the potential environmental and social risks and impacts were identified in general terms. As described earlier, Component 2 includes investments in MHIC, community and household irrigation systems, and risk management infrastructure with activities such as water source protection, water planting and harvesting, soil improvement, protection of water recharge areas and recovery of forested areas, infrastructure for water capture (harvesting of surface runoff, capture of small spring water and other alternative water sources), installation of family storage solutions, the conveyance of water to the field, and equipment necessary for water distribution on the plots. These activities will contribute to the conservation and improvement of ecosystems and productive systems. Due to the small to medium scale and location of civil works anticipated for each subproject, most risks and impacts are expected to be predictable, temporary, reversible, of low magnitude, site-specific, and with a low probability of major adverse human, health, or environmental effects.

29.The risks related to the construction of the infrastructure are: (i) risks related to water consumption and management during construction; (ii) risks of improper handling of waste and hazardous waste during construction; (iii) risks of contamination, atmospheric emissions, and noise during construction; (iv) risks of damage to archaeological remains due to excavations; (v) occupational health and safety risks; (vi) temporary or permanent river channel alteration and erosion processes. For these risks, the draft ESMF has considered the preparation of Environmental Management Plans (EMPs), which will be implemented in both the first and second subproject portfolios. For environmental risks related to the operation and maintenance of subprojects that could have impacts on natural habitats or modified habitats or population such as: (i) use of invasive species that are related to the impact on the ecosystem or natural habitat in reforestation activities; (ii) use of pesticides with high toxicity to the environment or population; and (iii) introduction of exotic crops to the detriment of native crops; (iv) reduced water availability in downstream communities; (v) reduced ecological flow; and (vi) risks related to the construction of small reservoirs (atajados or small dams), which may include changes in surface hydrology and reservoir safety considerations, the draft ESMF has defined criteria for environmental and social eligibility as well as a list of subproject exclusions to avoid any risk with significant impact. Although the draft ESMF does not have a cumulative impact assessment, the VRHR has indicated that only a few subprojects per municipality will be financed, thus reducing the risk of cumulative impacts from the implementation of more than one subproject in the micro-basins. For water resources planning and pre-investment studies under Component 1, the ESMF considered the terms of reference (ToR) and review of studies for both: (i) the EPHIC plans; and (ii) the development of pre-investment studies and detailed engineering designs for subprojects to be implemented in micro-basins, which will be related to water conservation, irrigation, and risk management infrastructure, to comply with the ESS of the Environmental and Social Framework (ESF). The final ESMF will be adopted and disclosed no later than 60 days after the Project effectiveness date.

30. The Project's social risk is considered Substantial. Based on the Social Assessment (SA), the Project's potential social risks include: (i) risk of elite capture and potential exclusion of vulnerable populations and groups, such as indigenous women, elders, youth, persons with disabilities, and sexual and gender minorities, whose interests could be under-represented from Project benefits if targeted strategies to ensure their engagement are not incorporated in the preparation and implementation of the Project. This is particularly important in an institutional context with limited level of coordination between the multiple entities expected to be involved, including the implementing agencies, UCEP-Mi Riego (Components 2 and 4) and UCP-PPCR (Components 1, 3 and 4) and the decentralized offices of both entities, the different water users organizations, subnational governments, and local intersectoral agencies; (ii) risk of conflict between communities over the benefits of irrigation systems. This has been identified in other projects where communities located in the upper basin and because the water sources are in their territories, tend to minimize or exclude the participation of communities located in the lower basin. (iii) risk that the negative impacts of the subprojects will fall disproportionately

on individuals or groups that, given their particular circumstances, may be vulnerable or disadvantaged; (iv) potential loss of the indigenous agricultural and biodiversity management knowledge of the mainly Quechua and Aymara population in the Project area, mainly as a result of agricultural TA and increased involvement in the market economy if cultural pertinence measures are not properly taken into account; (v) minor labor influx risks associated with the civil works, especially if codes of conduct are not followed, even though Project efforts will focus on promoting local hiring of community workers; (vi) potential increase or intensification of underlying local tensions (intra-or-inter-community) and even of conflicts if stakeholder engagement processes are not properly carried out in rural agricultural areas with water scarcity; (vii) social conflicts due to the potential reduced availability of water in downstream communities related to small reservoirs construction (atajados); (viii) use of areas with potential economic or social alternative uses, particularly agriculture, to build the community irrigation infrastructure works, creating an opportunity cost for the local population; (ix) increased expectations and demands of the local population for employment and income; (x) risk of reproducing structural gaps of gender inequity; and (xi) impact on women's traditional productive, reproductive and community roles. These risks could be more pronounced due to the sensitive context associated with the high level of migration in the Project area of young people over 19 years of age, which leaves part of the productive agricultural work in the hands of vulnerable groups such as women, children, and the elderly.

31.The Final ESMF will provide information about: (i) the potential direct, indirect and cumulative environmental and social (E&S) risks and impacts from the proposed investments based on the typology of activities and location; (ii) characterization of potential contextual E&S risks and issues which may be present in different beneficiary locations, including potential sexual exploitation and abuse/sexual harassment (SEA/SH) risks, risk of child labor, and potential intensification of social conflicts over the proposed water usage measures; (iii) identification of applicable national legislation, relevant WB Environmental and Social Standards, and any other applicable international requirements, and gaps to achieve consistency with the ESF; (iv) management and mitigation measures for potential E&S risks and impacts identified, both during construction and operation and maintenance; (v) identification of vulnerable groups and specific measures to prevent adverse impacts on them and improve their opportunities for inclusion; (vi) cultural pertinence measures and protocols to implement Project activities with indigenous peoples (IP) and Afro-descendants (AD) populations; (vii) a protocol to ensure that Project beneficiaries receive adequate information about the voluntary nature of any donation of land for irrigation works and prevent forms of coercion; (viii) a social assessment (SA); (ix) details of the requirements for site-specific Environmental and Social Management Plans (ESMPs) and checklists; and (x) implementation arrangements, capacity building measures, and budget for E&S management. It also includes subprojects exclusion list and guidelines for the Environmental Assessment of the subprojects in the EDTPs and for the ESMPs.

E. Implementation

Institutional and Implementation Arrangements

32.The MMAyA through its VRHR will serve as the implementing agency of the Project. Two existing Project Implementation Units (PIUs) located within the MMAyA will be responsible for Project implementation; these PIUs have been proposed by MMAyA due to their expertise in the different components of the Project. Their responsibilities are as follows:

- **The Coordination Unit of the Climate Resilience Program (UCP-PPCR) will implement activities related to water resources planning, pre-investment studies and TA that correspond to Components 1, 3 and part of Component 4.** The UCP-PPCR will maintain overall responsibility for all fiduciary aspects of the Project and the contracting of Project audits. The UCP-PPCR will also coordinate activities with the departmental and municipal

governments, UGCs and OGCs, disseminate information on the Project, and contract consulting services for water resources planning and pre-investment studies, as well as consulting services for TA during and after construction.

- **The Coordination and Implementation Unit of the Mi Riego Projects (UCEP-Mi Riego) will be responsible for the implementation of infrastructure investments that correspond to Component 2 and part of Component 4**. The UCEP-Mi Riego will be responsible for contracting out works and their supervision services. The UCEP-Mi Riego has regional offices in seven departments, La Paz, Oruro, Potosi, Chuquisaca, Tarija, and Cochabamba/Santa Cruz, which will be a critical element for Project implementation given its geographic scope and scale.

33. A Technical Coordination Committee will be set up to coordinate and monitor Project implementation. The chair of the Committee will be the Viceminister of Water Resources and Irrigation; the General Directors of Water Resources and Basins, and Irrigation, and the heads of both PIUs will also participate. Monthly coordination and monitoring meetings will be held with the participation of the WB. The UCP-PPCR has experience in projects financed by the WB, and the UCEP-Mi Riego has experience in projects financed by the Latin America Development Bank (CAF) and the Inter-American Development Bank (IDB). The Bank team carried out a detailed assessment of the PIUs' capacities to determine the resources and budget necessary to support them; additional resources will be considered and budgeted to support the PIUs during implementation as needed.

34.The municipal governments where the target communities and household are located will be actively involved in Components 1 and 3 of the Project, specifically in the identification of communities, the implementation of subprojects and the provision of back-up support to the participating communities. The extent of the scope of the municipal governments' functions and responsibilities will be described in the POM.

CONTACT POINT

World Bank

Luis Alfonso Alvestegui Justiniano
Senior Water Supply and Sanitation Specialist

Martin Benedikt Albrecht
Senior Water Resources Management Specialist

Griselle Felicita Vega
Senior Agriculture Specialist

Borrower/Client/Recipient

Plurinational State of Bolivia

Implementing Agencies

Viceministerio de Recursos Hidricos y Riego (VRHyR)
Eduardo Toromayo, Viceministro de Recursos Hídricos y Riego, eduardo.toromayo@mmaya.gob.bo
Clemente Quispe, Director General de Riego, clemente.quispe@mmaya.gob.bo

Ministerio de Medio Ambiente y Agua (MMAyA)
Ruben Mendez, Ministro de Medio Ambiente y Agua, ruben.mendez@mmaya.gob.bo

FOR MORE INFORMATION CONTACT

The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 473-1000
Web: http://www.worldbank.org/projects

APPROVAL

Task Team Leader(s):	Luis Alfonso Alvestegui Justiniano, Martin Benedikt Albrecht, Griselle Felicita Vega	

Approved By

Practice Manager/Manager:		
Country Director:	Pilar Maisterra	27-Nov-2023