



Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS)

Concept Stage | Date Prepared/Updated: 17-May-2018 | Report No: PIDISDSC23395

**BASIC INFORMATION****A. Basic Project Data**

Country Bolivia	Project ID P165365	Parent Project ID (if any)	Project Name Sustainable Household Irrigation Project (P165365)
Region LATIN AMERICA AND CARIBBEAN	Estimated Appraisal Date Sep 03, 2019	Estimated Board Date Jan 09, 2020	Practice Area (Lead) Water
Financing Instrument Investment Project Financing	Borrower(s) Plurinational State of Bolivia	Implementing Agency Ministry of Environment and Water	

Proposed Development Objective(s)

The project development objective is to provide irrigation and promote improved agricultural technologies among poor rural households in selected areas.

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	92.40
Total Financing	92.40
of which IBRD/IDA	85.00
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	85.00
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Non-World Bank Group Financing

Counterpart Funding	7.40
Municipalities of Borrowing Country	1.00
LOCAL: BENEFICIARIES	6.40



Environmental Assessment Category

B - Partial Assessment

Concept Review Decision

Track I-The review did authorize the preparation to continue

Other Decision (as needed)

B. Introduction and Context

Country Context

- Bolivia made remarkable economic and social progress during the commodity boom.** Boosted by gas and mining exports and public investment, economic growth averaged 5 percent between 2004 and 2014. Strong economic growth and prudent macroeconomic management allowed for sizeable fiscal and current account surpluses that contributed to accumulating sizable macroeconomic buffers: international reserves and public savings at the Central Bank increased from 13 to 46 percent of GDP and from 8.6 to 24 percent respectively over this period. This improvement was especially pronounced for the bottom 40 percent as higher commodity prices and growing domestic demand favored rural economic activities and non-tradeable sectors. As a result, Bolivia experienced one of the largest reductions in poverty and inequality in the region. Between 2002 and 2014, the national poverty rate declined from 63 percent to 39 percent; extreme poverty fell from 39 percent to 17 percent, and the Gini coefficient dropped from 0.60 to 0.48.
- Although the authorities have managed to cushion the effect of lower commodity prices on economic growth, the new normal has resulted in sizable macroeconomic imbalances and a slowdown of poverty reduction. A less favorable external context has reduced GDP growth from a peak of 6.8 percent in 2013 to an estimate of 4.2 percent in 2017; however, the Government of Bolivia has cushioned the slowdown through expansionary fiscal and monetary policies. This policy stance has caused sizable current account and fiscal deficits, estimated at 6.3 and 7.4 percent of GDP in 2017 respectively, which have been financed by external debt, Central Bank financing to state owned enterprises, and the reduction of macroeconomic buffers. Public debt increased from 37 percent of GDP in 2014 to an estimate of 50 percent in 2017, Central Bank international reserves fell from 46 to an estimate of 29 percent, and public savings at the Central Bank declined from 20 to an estimated of 14 percent. In this context, poverty reduction lost momentum as labor income in sectors that employ the poor (agriculture, mining and construction) saw little or no growth. Poverty has stayed around 39 percent between 2013 and 2016, as the reduction of rural poverty (from 60 to 57 percent) was offset by an uptick of urban poverty (from 29 to 32 percent).
- Bolivia continues to face significant development challenges, especially in rural areas where 62 percent of the extreme poor live.** Rural dwellers in Bolivia, especially those from indigenous heritages continue to face chronic poverty, and are highly vulnerable to climate shocks and food insecurity and are lacking basic services and access to transport infrastructure. The level of undernourishment is 15.9 percent, the highest in South America (FAO, 2015)¹. Over the last ten years, stunting in children under 5 years of age has remained at 27 percent nationally and 37 percent in rural areas (WFP, 2016)².

¹ FAO (2015): The State of Food Insecurity in the world (SOFI), <http://www.fao.org/3/a-i4646e.pdf>

² World Food Program (2016): WFP Bolivia Country Brief, <https://www.wfp.org/countries/bolivia>



4. **Bolivia's geographical characteristics, socioeconomic particularities and weak institutional frameworks – both at central and decentralized levels – render it highly vulnerable to climate change, particularly in rural areas which are home to the most vulnerable population**³. The retreat of glaciers and more frequent and intense extreme weather events, such as the 2013 floods in Bolivia's lowlands, or the drought which hit seven of the country's nine departments in 2016 have severe impacts on the welfare of Bolivia's population and its economy, especially the agricultural sector which employ roughly 80 percent of the rural population and represents 10 percent of Bolivia's GDP⁴.

Sectoral and Institutional Context

5. **Agriculture is the principal economic activity in rural Bolivia.** Farmers in the highlands and in the inter-Andean valleys primarily use the shorter wet season to produce potatoes, basic crops (maize, quinoa, wheat and barley) and vegetables (carrots and onions) for their own consumption as they have no access to irrigation. In addition, most families hold limited numbers of livestock. Selling surplus production is often the only economic income of rural families and work migration to urban centers during the dry winter months is very common.

6. **Agricultural production in these regions is exposed to a large number of risks, in particular climatic risks.** Although Bolivia produces an estimated 52,913m³ of freshwater per capita per year rendering it a worldwide leader in terms of availability of renewable water resources, large parts of the country, the Altiplano and the inter-Andean valleys are arid and semi-arid with frequent periods of water scarcity. Climate in these regions is characterized by a very distinct wet season (November to March), followed by a longer dry season with annual precipitation between 300 and 700mm. Rainfall amounts, as well as, start and duration of the rainfall season is highly variable. Due to climate change, the high natural climate variability is increasing, further jeopardizing water availability. In the Andean Region, the risk of droughts will further grow, particularly during ENSO (El Niño – Southern Oscillation) periods⁵. Other climatic risks are frost and hail damage. Temperatures can drop well below zero during winter months in areas of higher altitudes (3000 meters above sea level and higher), reducing options to diversify agricultural production.

7. **To cope with the high temporal rainfall variability, irrigation plays an important role in Bolivian agricultural sector. According to the latest irrigation inventory (2012)**⁶, Bolivia has 5,669 irrigation systems between 2 and 500 hectares (ha), covering approximately 303,192 ha which represents approximately 10 percent of the total cultivated area. Most of the irrigation systems (5,601), located in the highlands and in the inter-Andean valleys are characterized as small-systems (2-10 hectares) and are intrinsically linked to food security. These systems often face difficulties to cover the requirements of water for agricultural production due to the low efficiency of uptake, transport, distribution and watering combined with the heavy dependence on rivers as seasonal water sources and the lack of storage and regulation structures.

8. **Due to topographic or hydrological conditions and due to the often-encountered high dispersion of farmers in the remote areas, that do not allow a cost-efficient construction of traditional irrigation systems with a large reservoir or a river intake serving a group of farmers in many parts of the highlands and the inter-Andean valleys of Bolivia, in recent years a growing numbers of micro-scale household based irrigation systems were installed.** There are a large number of micro-scale household irrigation solutions for areas below 2 hectares, that capture discharge from small springs or harvest surface runoff for multiple purposes such as irrigation of household gardens, livestock watering, laundry and

³ World Bank (2011): Strategic Program for Climate Resilience

⁴ World Bank (2017): *La Sequía 2016 en Bolivia y su repercusión en las ciudades de La Paz y El Alto. Reconstrucción del evento, evaluación de capacidades de gestión y recomendaciones hacia el futuro*

⁵ Seiler, C., R. Hutjes and P. Kabat. 2012. Climate Variability and Trends in Bolivia. *Journal of Applied Meteorology and Climatology*.

⁶ MMAyA (2012): *Inventario Nacional de Sistemas de Riego 2012*



human consumption. Such micro-scale irrigation solutions allow rural households to both increase the diversity of their agricultural products and decrease their vulnerability to high climate variability (including protracted periods of water scarcity and droughts) with resulting impacts on food security. Evaluations demonstrated important benefits, such as better productivity and diversification of production because the increased security in front of losses by climate threats, improved nutrition, reduction in women's workload because lower migration of men, as well as environmental benefits such as less erosion due to complementary soil management activities⁷.

9. **The GoB recognizes the importance of irrigation for agricultural production and laid out an ambitious plan to further promote irrigation with the “Decade for Irrigation 2015-2025” Strategy⁸ in line with the 2025 Patriotic Agenda, the national development strategy⁹.** Bolivia was able to make significant investment in recent years. In the period 2012 to 2017, with own funds and through the support from international cooperation as BID or CAF it invested around US\$ 432 million, putting an additional 83.236 ha under irrigation¹⁰. Despite the successful experiences made with these small-scale irrigation projects, so far main investments are still directed to the construction of traditional irrigation systems with multiple users. In the period 2012-2017 it is estimated that only 2 percent of all investments made in the irrigation sector were inverted in household irrigation systems.

10. **At the national level, the MMAyA and its Vice Ministry of Water Resources and Irrigation (*Viceministerio de Recursos Hídricos y Riego del Ministerio de Medio Ambiente y Agua-VRHR*) are in charge of developing (i) specific sectoral policies; and (ii) government programs to strengthen water resources management (WRM) and to improve access to water for irrigation.** The installation of small-scale household irrigation solutions, although so far not included in any major investment program of the GoB, is a prioritized measure within the Bolivia's principal WRM policy, the *Plan Nacional de Cuencas*¹¹, and has been an integral part of many watershed management projects. The interest of rural municipalities in this type of household solutions is high and many rural development projects, also donor financed programs, include the installation of household irrigation systems. Since 2012, MMAyA reports on the installation of systems for 2,177 families irrigating an additional 1,613 ha in the six departments of Inter-Andean valleys and highlands of Bolivia¹². PROAGRO, the program for sustainable agricultural development, financed through Sweden and Germany, and implemented through the German Agency for International Cooperation (GIZ) has been constructing these systems since 2008¹³, but also other donors, such as the Belgian Cooperation and Government Programs, such as the mentioned *Plan Nacional de Cuencas* financed a number of household irrigation systems. The VRHR with the support of GIZ, carefully analyzed these experiences and elaborated guidelines underlying the planning and implementation of household irrigation projects. The comprehensive book on the implementation of household irrigation systems in the dry areas of Bolivia (MMAyA, 2016)¹⁴ and the technical guidelines for the elaboration of household irrigation projects (MMAyA, 2015)¹⁵ systematize lessons learned and guide future planning and implementation, as well as the integration of these productive activities in a broader WRM strategy. Several municipalities in the highlands and inter-Andean valleys, with the support of MMAyA and GIZ, have already applied these guidelines to prepare new household irrigation subprojects totaling

⁷ Soriano, R (2013): *Estudio de efectos diferenciados de los Proyectos Integrales de Cosecha de Agua (PICA) en la familia, Norte Potosí, sur de Cochabamba y La Paz*

⁸ GoB (2015): *Ley de la Década de Riego 2015-2025*, approved by Law N. 745, October 15, 2015

⁹ GoB (2015): *Agenda Patriótica del Bicentenario 2025*, approved by Law N. 650, January 19, 2015

¹⁰ MMAyA (2017): *Plan Sectorial de Desarrollo Integral del MMAyA*

¹¹ MMAyA (2013): *Plan Nacional de Cuencas, Programa Plurianual de Gestión Integrada de Recursos Hídricos y Manejo Integral de Cuencas 2013-2017*

¹² MMAyA (2016): *Base de datos del VRHR*, date April 2016.

¹³ From 2008-2013 PROAGRO constructed 1,157 systems in North of Potosi and South of Cochabamba

¹⁴ MMAyA, PROAGRO (2016): *Riego familiar en regiones secas de Bolivia: guía para su implementación*

¹⁵ MMAyA (2015): *Guía para la elaboración de proyectos de riego familiares*



roughly US\$ 6 million to benefit families in the most remote and poor communities where traditional irrigation solutions are not considered feasible.

11. **With these successful experiences, the extensive knowledge on potential benefits, the large number of well-established planning and design instruments for household irrigation systems, the GoB is now more and more strengthening its support to household irrigation.** While the 2025 Patriotic Agenda and the Decade of Irrigation 2015-2025 Law already lay out the general policy to promote irrigation, the mid-term *Economic and Social Development Plan (2016-2020)*¹⁶ defines more specific objectives for small-scale household irrigation. In 2016, the GoB further developed and prioritized its “*Harvesting Water - Sowing Light*” Program¹⁷, which aims to facilitate access to safe water for multiple uses; as well as alternative and renewable sources of energy to improve living conditions in poor and dispersed rural communities. The Program’s *Safe Water* component consists of the use water harvesting technology for the purposes of human consumption, livestock watering and gardening irrigation. The GoB has decided to separate the scope of this Supreme Decree into two programs. One will cover (i) water services for human consumption, with roof-based rainwater harvesting (supported through *The Rural Water Access Project (P161731)*¹⁸); and the second program will address (ii) productive aspects via the provision of household irrigation systems through surface runoff harvesting or small springs. The proposed *Sustainable Household Irrigation Project* will support this second program.

12. **Projects implemented by the Bank have the potential to create complementarity with this new initiative.** The WB’s Community Investment in Rural Areas (PICAR) project¹⁹, a community driven development (CDD) project, is providing support to develop initiatives at the level of rural poor communities situated in the most disadvantaged municipalities. The implementation strategy starts with a prioritization process in which first women and later the community decide on investment priorities. Selected subprojects are financed with per family investment limits – US\$ 500 in the case of projects prioritized by women and US\$1,000 in the case of community subprojects. During implementation of their respective subproject, communities take charge of the administration and accountability of resources following training to this effect. To date, the PICAR Project has financed approximately 30 household irrigation systems in the highlands and Inter-Andean valleys benefiting roughly 1,100 families which represent around 3 percent of the committed subprojects. The household irrigation initiatives that emerged from the prioritization processes, but which were not financed by PICAR Project, may be included in the Household Irrigation Project if they meet the established criteria. The objective of the Bolivia Climate Resilience Project (P129640)²⁰ is to strengthen Bolivia’s institutional capacity for water resources management on the national level to better adapt to climate change and to develop and implement strategic river basin management plans in sub basins of the Rio Grande basin, located mainly in the department of Cochabamba. These river basin management plans may also include the installation of household irrigation systems as part of watershed management subprojects. Since the main objective of these watershed management projects is conservation, only a small percentage of the funding will be used for new irrigation infrastructure. Demands for household irrigation solutions identified within the water resources management planning of the Climate Resilience Project can be financed through the Sustainable Household Irrigation Project. This way the Climate Resilience Project will contribute to the investment planning of the Sustainable Household Irrigation Project.

¹⁶ GoB (2016). *Plan de Desarrollo Económico y Social en el Marco del Desarrollo Integral para Vivir Bien (2016-2020)*, approved by Law N. 786 (March 9, 2016)

¹⁷ GoB (2016). Supreme Decree 2854 “*Cosechando Agua, Sembrando Luz*”, approved on August 2, 2016

¹⁸ The Bolivia Rural Water Access Project (P161731) is currently under preparation. Expected Board approval date: January 2020

¹⁹ Bolivia – Community Investment in Rural Areas Project (P107137) from 2011 to 2017 with a total cost of US\$ 25 million, and Bolivia – Community Investment in Rural Areas Project, Additional Financing (P154854) from 2015-2019 with a total cost of US\$ 64 million

²⁰ Bolivia Climate Resilience - Integrated Basin Management Project (P129640): Duration: 2014-2020, Total Cost: US\$ 71.4 million



Relationship to CPF

13. **The proposed project will contribute to the achievement of higher level objectives of the GoB's.** In 2013, the GoB launched the 2025 Patriotic Agenda, a national plan that establishes medium-term policy objectives to eradicate extreme poverty and improve the country's population well-being. To operationalize the 13 pillars of this strategy, the Social and Economic Development Plan 2016-2020 has set specific targets. The Project is directly contributing to objective of pillar 1 (eradicate extreme poverty), pillar 6 (productive sovereignty), pillar 8 (food security) and pillar 9 (environment and sustainable development).

14. **The project will also support the World Bank Group's Twin Goals of ending extreme poverty and boosting shared prosperity.** It has a strong pro-poor focus and is directed to Bolivia's most vulnerable population. With the installed household irrigation systems, poor rural families will be able to secure and diversify their food production and become more resilient to climate shocks. The introduction of marketable products, such as fruits or herbs with water efficient irrigation systems will boost farm productivity. Widespread seasonal male labor migration will decrease with the new income opportunities reducing also the work load of women.

15. **The Project is also fully aligned with the World Bank Group Country Partnership Framework 2016-2020** and directly contributes to Pilar 1 (*Promoting Broad-based and Inclusive Growth*), objective 3 (Improve opportunities for income generation), as well as, Pillar 2 (*Addressing Environmental Sustainability and Resilience to Climate Change*), objective 1 (*Strengthen Capacity to Manage Climate Change and Reduce Vulnerability to Natural Disasters*). The Project supports the efforts to further reduce poverty in rural areas and is in line with the ongoing lending operation, the *Community Investment in Rural Areas Project PICAR* (P154854), currently concluding its first phase and initiating the second one, the *Climate Resilience Project* (P129640), as well as, the *Rural Water and Energy Access Project* (P161731), currently under preparation.

C. Proposed Development Objective(s)

The project development objective is to provide sustainable access to water for irrigation to poor rural households in selected remote areas.

Key Results (From PCN)

1. Number of beneficiary families using irrigation after one year of subproject conclusion.
2. Area provided with new/improved irrigation services.

D. Concept Description

16. **The proposed Project in the amount of US\$ 85 million from IBRD and US\$ 7.4 million from local counterpart, will support the installation and/or improvement of small scale household irrigation solutions for 10,000 beneficiary families in initially prioritized 137 municipalities in 6 departments of Bolivia.** Small-scale household irrigation solutions provide water for areas below 2 hectares and are owned by a single or a small group of families. Designs are simple and costs for operating and maintenance are low. Community organizations or farmer associations do not participate in the management of these systems. In most cases the irrigation solutions provide water for multiple uses including livestock watering and domestic uses. Two types of irrigation systems will be financed: (i) Collection of discharge from small springs,



and (ii) harvesting of surface runoff. The design, construction and operation of the irrigation systems builds on the large number of successful experiences that the MMAyA has had during the last years. Planning and implementation of the sub-projects will closely follow the recently developed guidelines. The project will not demand any in-cash counterpart but will define in-kind contributions by the beneficiaries.

17. **The Project has three components:** (i) Construction of household irrigation systems such as spring development, water storage and conduit infrastructure, as well as, on farm equipment such as drip or sprinkler irrigation systems); (ii) Technical support for design, supervision and technical assistance (operation and maintenance of household irrigation systems, smallholder climate smart irrigation agriculture and watershed conservation, development of technical skills at municipal level), and (iii) project management. The design and implementation of infrastructure investments as well as the technical assistance and training of farmers in agricultural production and watershed conservation will closely follow the above-mentioned guidelines which were recently developed by MMAyA.

18. **Component 1: Construction of household irrigation systems (Cost US\$69.4 million).** The component will finance the installation and/or improvement of the irrigations systems, including the needed infrastructure for water capture (collection of surface runoff or spring water abstraction point), the construction of the water storage facility, water conduction piping and the needed equipment for drip or sprinkler irrigation. Several sub-projects will be bundled and tendered in packages. While contracting of these works will be done directly by the Project Implementation Unit, supervision of works will be undertaken by the companies providing the technical assistance and training (see component 2). Beneficiaries will provide an in-kind counterpart of US\$ 6.4 million.

19. **Collection and use of spring discharge.** In the mountainous area, small springs with perennial discharge below 3 l/s are quite common. These water sources are often unused or utilized very inefficiently. The Project will finance the installation of a simple water intake point, a small tank of 10 to 120 m³ and micro irrigation equipment (sprinkler and drip irrigation tubes). Water is collected throughout the entire year and is mostly of very good quality. It is often adequate for multiple, including domestic uses. The success and sustainability of these kind of projects have been very high. An ex-post evaluation of projects in Northern Potosi and Southern Cochabamba showed that 90 percent of installed systems were still in use several years after their installation.

20. **Rainfall Harvesting.** For families with no access to a permanent water source, harvesting of surface runoff after rainfall events is the only feasible alternative to improve access to irrigation water in the Project region. Due to the steep slopes and poor soils with low infiltration capacity, the usual high intensity rainfall events generate significant amounts of surface runoff. Small reservoirs with a volume of 1,200 to 5,000m³ usually constructed with local material such as clay, the so called *atajados*, collect the runoff in areas with moderate slopes. The water stored in these *atajados* is then mostly used for supplementary irrigation of the rain-fed crops and for animal watering. An ex post evaluation of a large number of similar projects, however, showed that a significant percentage of these systems stopped working. Main reasons can be attributed to: (i) inadequate design and positioning of the reservoirs; (ii) migration and abandonment of the systems; and (iii) insufficient technical assistance to farmers who largely had no prior experience with irrigation. Despite these risks and the relative high costs, *atajados* have proven to be a reliable source for irrigation water in semi-arid regions throughout the world. For families with no access to a permanent water source, a carefully planned *atajado*, can provide sustainable access to irrigation water. The MMAyA has developed a comprehensive set of criteria for the identification of these projects and recommendations for planning and implementation²¹.

21. **Component 2: Technical Support (Cost US\$17.44 million).** This component includes all required consulting services for the design of irrigation infrastructure, the supervision of the construction works, and the technical assistance,

²¹ MMAyA (2015): *Guía para la elaboración de proyectos de riego familiares*.



including the provision of tools and material needed for agricultural support and watershed conservation activities. The designs for the subprojects will be provided by (i) a development partner, such as GIZ or the Swiss Agency for Development and Cooperation COSUDE, who within their projects, already prepared or are currently preparing household irrigation projects, by (ii) programs of the MMAyA, as for example, the *Plan Nacional de Cuencas*, (iii) municipalities, or (iv) will be contracted in packages to experienced project developers. The supervision of the construction works and technical assistance for the household irrigation sub-projects will be combined into one service contract and tendered in packages similar to the packages of contract works. Supervision will also provide technical assistance to municipality staff to ensure, among others, they have the capacity to support ongoing implementation following completion of Project activities. Based on past household irrigation projects implemented by the MMAyA, it is estimated that for the design of the irrigation systems 6 percent (US\$ 3.8 million) of the total construction costs (component 1) is needed. Supervision will cost 7 percent (US\$ 4.4 million), technical assistance to beneficiaries' 10 percent (US\$ 6.3 million) and technical assistance to municipality's staff 3 percent (US\$ 1.9 million) of the construction costs. Municipalities will provide an in-kind counterpart of US\$ 1 million.

22. Experience shows that adequate and sufficient technical assistance is crucial for the sustainability of household irrigation projects. Beneficiary families are to be trained in three aspects: (i) operations and maintenance (O&M) of the irrigation infrastructure; (ii) agricultural production under irrigation; as well as, (iii) management and conservation of the contributing watershed. Contracted technical assistance are expected to begin in tandem with the construction works and to last at least 18 months for systems using spring discharge and 24 months for systems using *atajados*. For each system, a management plan integrating the different aspects of technical assistance, will be developed together with the beneficiaries. A standard format for these sustainable management plans will be developed during project preparation based on the rich experience gained in recent household irrigation projects. This instrument will also be used to register all new systems and water use. Technical staff of the municipalities will form part of the capacity building by the contracted technical assistance to ensure that they acquire the capacity to provide support to local farmers following Project close.

23. Component 3: Project Management (Cost US\$5.56 million). This component will finance the operational costs of the project implementation unit (UCP – *Unidad Coordinadora de Programas*) to coordinate, implement and monitor the project. The central UCP will be supported by regional decentralized units. The number, size and responsibilities of these units will be defined during project preparation and described within the operational manual of the project. While the identification and design of sub-projects will be coordinated by the UCP, validation of the projects will be done by decentral committees with the participation of local authorities. Construction of the household irrigation systems, as well as, supervision and technical assistance will be bundled and tendered in packages.

24. Area of intervention: VRHR together with the Ministry of Planning have prioritized a first set of 137 municipalities in 6 departments of Bolivia. For this selection, the Bolivian Government applied a set of criteria, including the poverty level of the population based on the 2012 census and the principal productive activity of the municipality being agriculture. The selected municipalities belong to the ecoregions of the Bolivian Altiplano, the Inter-Andean Valley and the Bolivian Chaco, all of which are predominantly situated in a mountainous geography and lie at an altitude of 1.500 to 4.000 meters above sea-level. The average annual rainfall is 400-700mm with a prolonged dry period of at least 7 months. The high inter-annual variability leads to frequent drought, a risk which continues to increase as a result of climate change.

25. Beneficiaries: The Project targets 10,000 poor rural families with low resilience to climate shocks. The beneficiaries permanently reside in the area and their primary economic activity is agriculture. Families express strong interest in the use of water for irrigation. Tenancy of land and existing water sources is clear and no land conflicts exist. The premises include a natural spring with a discharge of at least 1000 m³ per year or an adequate area to harvest 1,200 m³ or more surface runoff per year (slopes between 4 and 15 percent).



26. **Women play an important role in the planning and implementation of the interventions and are crucial for the sustainability of the project.** In rural Bolivia, women are often in charge of the provision of food. In this regard, animal husbandry and household kitchen gardens are crucial to guarantee better nutrition of the families, in particular in communities with a high seasonal labor migration of men. Water supply for these activities and for domestic uses mostly falls under the responsibilities of women, and that increase time burden for them. Most women, as well as men in the remote areas, do not have knowledge or experience in irrigation agriculture. The Project will therefore incorporate the gender perspective in the design of the interventions, and directly address and foster the active participation of women during planning and implementation.

27. **The overall Climate and Disaster Risk to the outcome/service delivery of the project is deemed low for current and moderate for future conditions.** The Climate and Disaster Risk Screening identified droughts, variable and extreme precipitation, and flooding as the main natural hazards at project intervention areas. The Project is mitigating these risks by enhancing: (i) resilience to climate impacts through household irrigation systems that will improve seasonal use of water resources for irrigation, (ii) supporting detail designs of irrigation infrastructure for water capture, storage and conduction, including their location, (ii) develop technical capacity at household and municipal levels to operate, maintain and monitor irrigation systems, such as to ensure sustainability of infrastructure investments and continuously improve their resilience to climate change, (iv) and promote climate smart irrigation agriculture and watershed conservation as mechanisms to both adapt and mitigate climate risks.

SAFEGUARDS

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

MMAyA together with the Ministry of Planning prioritized a first set of 137 municipalities located in the Altiplano, the Inter-Andean Valleys and the Chaco ecoregions of the departments of La Paz, Oruro, Cochabamba, Tarija, Chuquisaca and Potosi. A Social Assessment (SA) that will analyze socio – cultural issues will be prepared by the borrower. Considering that the majority of the target population in the selected municipalities is indigenous, therefore the OP/BP 4.10 will be triggered to include all the elements of an Indigenous People Plan (IPP) in the overall project design. To ensure adequacy to the policy, the client will further undertake consultation processes with the beneficiaries and their local organizations. The SA will be disclosed in country and at the Bank's external webpage prior to appraisal.

Since the type, location, actual scale and potential impact of the installation or improvement of small scale household irrigation solutions are still not known, the Borrower will prepare an Environmental and Social Management Framework (ESMF) that outlines an environmental and social screening process for identifying and mitigating potential negative environmental and social impacts at the sub-project planning and operation stages. Typical environmental impacts include generation of dust and domestic waste by workers in work fronts, abandonment of construction waste (e.g. cement empty bags, old pipelines, construction materials, etc.), and removal of vegetation. In terms of safety related impacts, water storage facilities (e.g. atajados, reservoirs) may represent a high risk due to lack of a fence and signals preventing entrance of children. Quarries used to get materials for water storage facilities might generate adverse environmental, health and safety impacts if not managed properly.

B. Borrower's Institutional Capacity for Safeguard Policies

Project executing agency's institutional capacity for social and environmental safeguards and management will be



assessed during the project preparation stage and findings of that assessment will be included in the ESMF. Specific recommendations for institution strengthening on social and environmental management issues will be addressed in the ESMF before Appraisal. The MMAyA has prior experience with WB environmental and social safeguard policies (Pilot Program on Climate Resilience-PPCR 2) and is familiar with preparation of an ESMF.

C. Environmental and Social Safeguards Specialists on the Team

Juan Carlos Enriquez Uria, Environmental Safeguards Specialist
Angela Maria Caballero Espinoza, Social Safeguards Specialist

D. Policies that might apply

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The project is classified as category B, according to the OP/BP 4.01 on Environmental Assessment; based on the fact that its potential negative environmental impacts are site specific, reversible and easy to mitigate. Typical environmental impacts include generation of dust and domestic waste by workers in work fronts, abandonment of construction waste (e.g. cement empty bags, old pipelines, construction materials, etc.), and removal of vegetation. In terms of safety related impacts, water storage facilities (e.g. atajados, reservoirs) may represent a high risk due to lack of a fence and signals preventing entrance of children. As part of the Environmental Assessment Policy (OP/BP 4.01) the Borrower will prepare an Environmental and Social Management Framework (ESMF) to: i) describe the environmental regulatory and institutional frameworks applicable to the project; ii) identify the environmental impacts and risks during the design, implementation and operation of small-scale investment subprojects; iii) present the environmental screening and categorization procedures for this kind of projects; iv) describe physical cultural resources related chance find procedures; v) propose appropriate prevention, mitigation or compensation measures to manage the negative environmental impacts and risks and facilitate the process of implementing and monitoring them; and, vi) describe the project implementing agency's existing capacity in terms of social and environmental safeguards and management as well as capacity strengthening needs. The ESMF will be subject to a consultation process among key stakeholders.



Performance Standards for Private Sector Activities OP/BP 4.03	No	
Natural Habitats OP/BP 4.04	TBD	Although subprojects to be supported are located outside natural protected areas that are part of the SERNAP, small springs are a key element of natural habitats. Subprojects will be implemented in areas already occupied by the farmers and that are already cultivated but natural habitats interact with and provide services to these agricultural landscapes.
Forests OP/BP 4.36	No	The project will not impact health and quality of forests; will not affect the rights and welfare of people dependent on forests; and will not bring about changes in the management, protection, or utilization of natural forests or plantations.
Pest Management OP 4.09	Yes	This policy was triggered because agricultural activities to be dependent upon irrigation practices may require the use of fertilizers or herbicides to control or prevent pests. The ESMF will describe existing requirement in Bolivia to deal with pest management and an Integrated Pest Management Plan will be prepared.
Physical Cultural Resources OP/BP 4.11	Yes	This policy is triggered as a precautionary measure to avoid impacts to the country's diverse cultural and historical physical resources spread across the Bolivian Andean region (Altiplano). Since this project includes infrastructure rehabilitation and construction and still the location of these works is unknown, this policy is triggered.
Indigenous Peoples OP/BP 4.10	Yes	Considering that Indigenous Peoples (IP), are the majority of the direct project beneficiaries, the OP/BP 4.10 is triggered and a Social Assessment (SA) will be prepared by the borrower. During the SA preparation, free, prior and informed consultations will be undertaken ensuring that men and women perceptions (of different age groups if relevant) around impacts, risks, mitigation measures, could be identified and later included to improve the project design and the POM. Also, the elements of an Indigenous People Plan (IPP) such as cultural pertinence approach; participatory planning and consultation during the project cycle will be included in the Social Management Framework.
Involuntary Resettlement OP/BP 4.12	No	The OP/BP 4.12 Involuntary Resettlement is not triggered since land tenancy, assets and economic incomes of beneficiaries won't be affected at all. The



project will provide single-family irrigation solutions. Only in cases where the micro basin for rainwater harvesting reaches 2-3 hectares, or the springs reach a flow of 2 or 3 L/sec., 2 or 3 families would be able to benefit from the same irrigation system. In cases of springs, small infrastructures of a few square meters (5 to 10) will be built to protect the water source. The tanks of regulation in these cases will reach a capacity of 20 or 30 m³ and will occupy an area of around 20 m². In cases of rainwater harvesting, the micro-basin management will be improved to conduct the collected water to atajados that will reach 1000 to 5000 m³ capacity, and will occupy an area of around 30 x 30 m². The atajados, the regulation tanks, and the shelters to protect the water sources will not involve the taking of land, will not result in loss of fixed assets, and there will be no loss of income resulting from these structures. The ESMF will include a screening process that ensures that no sub-projects are financed that would result in involuntary land acquisition. The solutions for a bunch of two or three households, the water use rights, the consultations to identify risks to access to water resources (e.g. for families not participating in the project), will be addressed under OP 4.01 and OP 4.10 when it concerns to IPs. A Conflict Management Plan for all these issues, will be included in the Social Management Framework.

Safety of Dams OP/BP 4.37

No

Project activities will neither support the construction or rehabilitation of dams nor will it support other investments which rely on services of existing dams. The beneficiaries do not have access to water from a dam, they will only use small slopes or harvest rain ("Atajados")

Projects on International Waterways
OP/BP 7.50

Yes

Due to the slopes, even if their flows are negligible, they affect the basins of the Amazon, de La Plata and Endorreic; therefore the safeguard policy has been triggered. An exception will be requested for the VP's clearance so it would not be necessary a notification to affected countries.

Projects in Disputed Areas OP/BP 7.60

No

The Project will not finance activities in disputed areas as defined in the policy.



E. Safeguard Preparation Plan

Tentative target date for preparing the Appraisal Stage PID/ISDS

Sep 03, 2019

Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the Appraisal Stage PID/ISDS

The Environmental and Social Management Framework will be prepared from November 2017 to May 2018. The Social Management Framework (including the Social Assessment) will be presented in a separate document. This document will also include the Conflict Management Plan to attend issues related to the water use rights, access to water resources and solutions for a bunch of two or three households in the same irrigation project.

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APPROVAL

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