

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

BOLIVIA

BOLIVIA RESILIENT TO CLIMATE RISKS

(BO-L1188)

LOAN PROPOSAL

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CONTENTS

PROJECT SUMMARY

I.	DESCRIPTION AND RESULTS MONITORING	1
A.	Background, problem to be addressed, and rationale	1
B.	Objectives, components, and cost	7
C.	Key results indicators	9
II.	FINANCING STRUCTURE AND MAIN RISKS	11
A.	Financing instruments	11
B.	Environmental and social risks	11
C.	Fiduciary risks	12
III.	IMPLEMENTATION AND MANAGEMENT PLAN	13
A.	Summary of implementation arrangements	13
B.	Summary of results monitoring arrangements	16
C.	Post-approval design activities	16

APPENDIX

Proposed resolution

ANNEXES	
Annex I	Summary Development Effectiveness Matrix (DEM)
Annex II	Results Matrix
Annex III	Fiduciary Agreements and Requirements

ELECTRONIC LINKS
<p>REQUIRED</p> <ol style="list-style-type: none"> 1. Development Effectiveness Matrix (DEM) 2. Multiyear Execution Plan (MEP) and Annual Work Plan (AWP) 3. Monitoring and Evaluation Plan 4. Procurement Plan <p>OPTIONAL</p> <ol style="list-style-type: none"> 1. Bibliography 2. Statistics on poverty and income inequality in Latin America and the Caribbean (18 countries) 3. Disaster Risk Profile for Bolivia on flooding and landslides in selected watersheds (RG-T2416) 4. Disaster risk and risk management indicators 5. Action Plan for Sustainable Cochabamba Metropolitan Area 6. Disaster risk management project experiences 7. Climate Change and the IDB: Building Resilience and Reducing Emissions. Annex III: Sector Study on Disaster Risk Reduction 8. Comprehensive management of the Alpacoma basin 9. Institutional/Personnel analysis, FPS procedures 10. Flood and landslide risk analysis study 11. Economic analysis 12. Files with technical designs of works in the sample 13. Program Operating Regulations 14. Institutional/Personnel analysis, UCEP procedures 15. 2015 Joint Report on Multilateral Development Banks' Climate Finance 16. Program MEP/AWP (in Microsoft Project) 17. Planning instruments

ABBREVIATIONS

AWP	Annual work plan
CCA	Climate change adaptation
DRM	Disaster risk management
ESA	Environmental and Social Analysis
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Management Report
ETAs	Entidades Territoriales Autónomas [autonomous subnational governments]
EWS	Early warning system
FFF	Flexible Financing Facility
FPS	Fondo Nacional de Inversión Productiva y Social [National Productive and Social Investment Fund]
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
LIBOR	London Interbank Offered Rate
MEP	Multiyear execution plan
MMAyA	Ministry of the Environment and Water
NPV	Net present value
OC	Ordinary Capital
RMI	Risk Management Index
UCEP	Unidad de Coordinación y Ejecución Más Inversión para Riego [More Investment for Irrigation Coordination and Execution Unit]
UGRHPTE	Unidad de Gestión de Riesgos Hidrológicos, Proyectos y Temas Estratégicos [Unit for Hydrological Risk Management, Projects, and Strategic Issues]
UNISRD	United Nations Office for Disaster Risk Reduction

PROJECT SUMMARY

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Terms and Financial Conditions			
Borrower:	Source	Amount (US\$)	%
Plurinational State of Bolivia	IDB (regular OC):	34,000,000	85
	IDB (concessional OC):	6,000,000	15
	IDB:	40,000,000	100
Executing agencies:			
Ministry of the Environment and Water (MMAyA) and the National Productive and Social Investment Fund (FPS)	Total:	40,000,000	100
	Regular OC (FFF) ^(a)	Concessional OC	
Amortization period:	20.5 years	40 years	
Disbursement period:	5 years	5 years	
Grace period: ^(b)	7.5 years	40 years	
Interest rate:	LIBOR-based	0.25%	
Credit fee:	^(c)	N/A	
Inspection and supervision fee:	^(c)	N/A	
Weighted average life (WAL):	15.25 years	N/A	
Currency of approval:	U.S. dollars		
Project at a Glance			
Project objective/description: The objective of the program is to make Bolivia more resilient to climate risks. The specific objectives are to: (i) improve management and sustainable use of natural capital by implementing risk reduction and climate change adaptation measures; and (ii) enhance knowledge about climate risks among public agencies responsible for risk identification, land-use planning, and public investment management.			
Special contractual conditions precedent to the first disbursement of the loan proceeds: (i) the program's inclusion in the portfolio of the Unidad de Coordinación y Ejecución Más Inversión para Riego [More Investment for Irrigation Coordination and Execution Unit] (UCEP) has been approved; (ii) the selection process has begun for key personnel that will participate in the program (the technical manager, procurement specialist, financial specialist, environmental specialist, and social specialist) in keeping with the profiles established in the terms of reference previously agreed to with the Bank (paragraph 3.3); and (iii) the MMAyA has approved the program Operating Regulations , which include the Environmental and Social Management Framework, in the terms previously agreed to with the FPS and with the Bank's prior no objection, and these Regulations have entered into force (paragraph 3.6). See also special environmental and social contractual conditions in Annex B of the Environmental and Social Management Report (ESMR) (required link 4).			
Special contractual conditions of execution: Prior to bidding on works, each autonomous departmental or municipal government involved will sign an intergovernmental agreement with the MMAyA and FPS determining their involvement in program execution, including maintenance of works (paragraph 3.8). See also special environmental and social contractual conditions in Annex B of the ESMR (required link 4).			
Exceptions to Bank policies: None.			

Strategic Alignment					
Challenges: ^(d)	SI	<input checked="" type="checkbox"/>	PI	<input checked="" type="checkbox"/>	EI <input type="checkbox"/>
Crosscutting themes: ^(e)	GD	<input type="checkbox"/>	CC	<input checked="" type="checkbox"/>	IC <input checked="" type="checkbox"/>

- ^(a) Under the terms of the Flexible Financing Facility (document FN-655-1), the borrower has the option of requesting changes in the amortization schedule as well as currency and interest rate conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.
- ^(b) Under the Flexible Financing Facility's flexible repayment options, the grace period may be changed provided that the original weighted average life (WAL) of the loan and the date of last payment established in the loan contract are not exceeded.
- ^(c) The credit fee and the inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with relevant policies.
- ^(c) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).
- ^(d) GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. DESCRIPTION AND RESULTS MONITORING¹

A. Background, problem to be addressed, and rationale

- 1.1 **Impact of disasters in Bolivia.** Bolivia is one of the Andean countries that is hardest hit by natural disasters. From 1970 to 2016, 70 disasters struck Bolivia, causing 1,583 deaths and impacting more than 7.7 million people, 99.6% of whom were affected by hydroclimatic events (EM-DAT,² 2016). Of note are the landslides, flooding, and droughts³ associated with episodes of El Niño from 1983 to 1984 and 1997 to 1998, with estimated losses equivalent to 15.3% and 6.3% of GDP, respectively, and the inverse phenomenon, called La Niña, from 2007 to 2008, with GDP losses of 5.1%. More recently, flooding in 2013 and 2014 left in its wake 400,000 victims and damages estimated at 1.3% of GDP (Government of Bolivia, 2015).
- 1.2 **The effect of climate change.** In the coming years, the problems that hydro-meteorological events cause could worsen due to the effects of climate change. In keeping with the Plurinational State of Bolivia's intended nationally determined contributions (Government of Bolivia, 2015) by 2030 27% of its national territory may be affected by persistent drought and 24% by frequently recurring floods. That document prioritizes disaster risk management (DRM) measures as a strategy to mitigate climate risks. According to the baseline on Bolivia's climate scenario models (MMAyA, 2014), which is part of the Third National Communication, those models for Bolivia show a trend toward changes in precipitation patterns (delay in the onset and shortening of the rainy season) and greater frequency of extreme events (hail, severe rain, and drought).
- 1.3 **Identification of the problem.** This frequent recurrence of disasters is contributing to an increase in poverty in Bolivia, which is the poorest country in the Andean region.⁴ Disasters reduce society's level of savings and therefore the amount of capital and output per person, and affect per capita income and growth rates in the long term (Moreno and Cardona, 2011). One of the immediate effects is the destruction of productive capacity, which results in diminished labor productivity and demand for labor, decreasing employment levels in the short term (Charvériat, 2000). High-impact natural disasters leave an estimated 42,387 people impoverished every year in Bolivia, which is more than 19% of the total for the Andean region (Hallegatte et al., 2017).
- 1.4 Disasters particularly impact people living in poverty in multiple ways: the poor frequently are overexposed because they are only able to reside in at-risk areas and depend on unstable agriculture-related income (Akter and Mallick, 2013; Noack et al., 2015; Patankar, 2015), and they are more vulnerable in terms of assets and

¹ The references included in this document are available at [optional link 1](#).

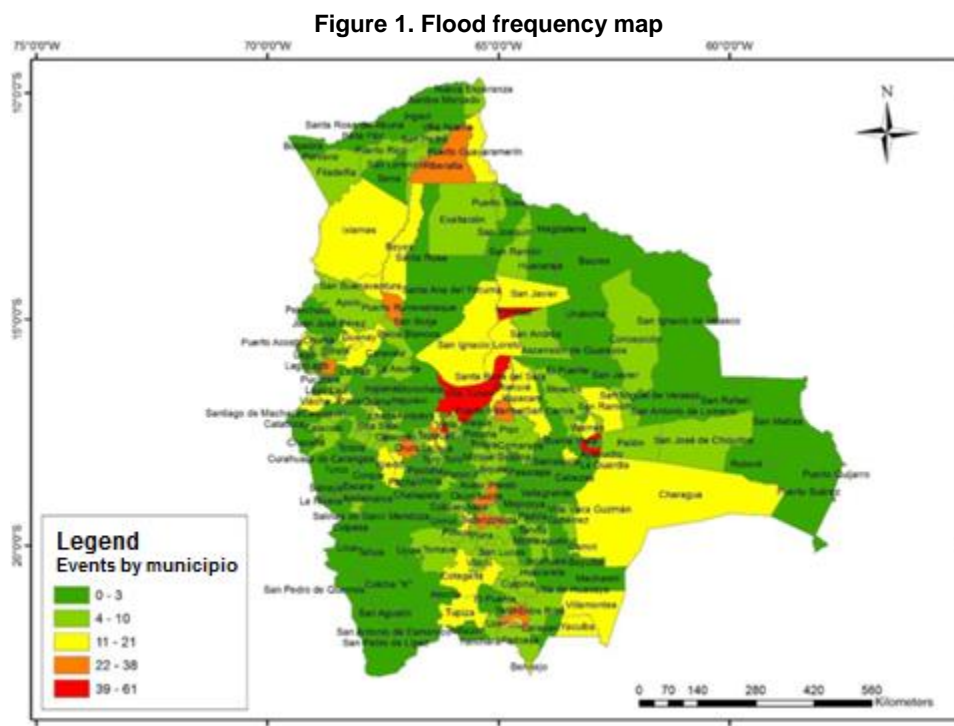
² The International Disaster Database of the University of Louvain.

³ El Niño affects Bolivia in a different way than its Andean neighbors Ecuador and Peru. In Bolivia precipitation increases almost 25% in the western regions over the normal average, while it decreases almost 30% in the highlands with respect to the normal average. When El Niño occurs, it causes very different emergency situations throughout Bolivia, such as drought in the eastern part of the country and flooding and landslides in the western part, where La Paz is located (National Meteorology and Hydrology Service (SENAMHI), 2002).

⁴ In all, 38.6% of Bolivia's population lives below the national poverty line—the highest level of poverty in the Andean region ([optional link 2](#)).

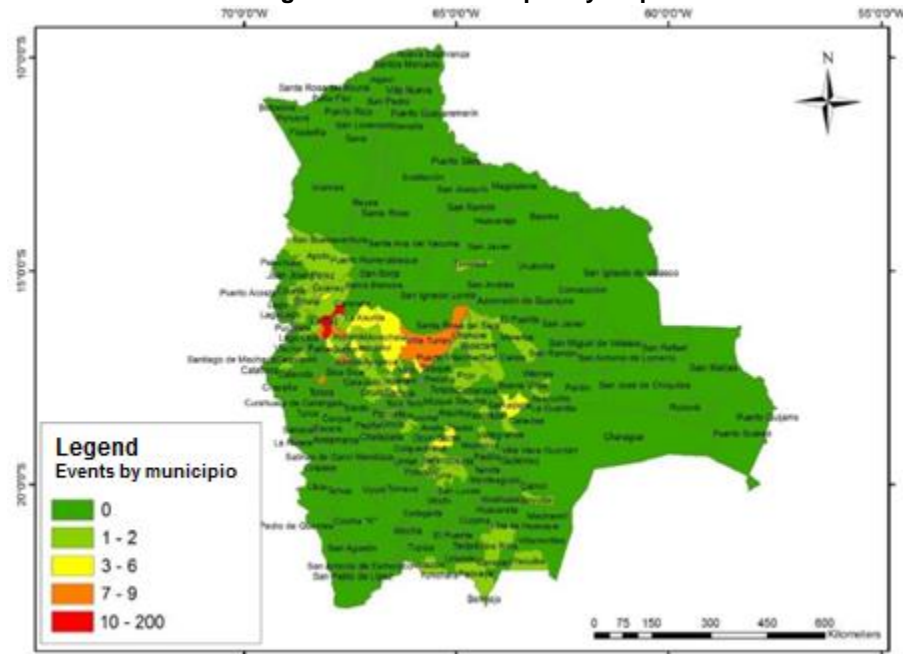
livelihoods (Carter et al., 2007; Rabbani et al., 2013). The poor also have less capacity to resist and recover and less access to formal loan and insurance markets (Gentle et al., 2014; Guerrero, 2013). They are forced to make decisions with irreversible negative effects on their education and health that reinforce intergenerational transmission of poverty, such as taking children out of school early, increasing child labor, or cutting health spending (Kousky, 2016; Bustelo, 2011).

- 1.5 **Areas with greatest climate risk in Bolivia.** The disaster risk profile study for Bolivia regarding flooding and landslides in selected basins ([optional link 3](#)) has identified, based on the recorded number of these events in the Desinventar database, the areas that are most susceptible to these disasters. Among others, the municipios located in the sub-basins of the Rocha, Espíritu Santo-San Mateo Rivers, the Grande river basin, and the Mamoré river basin stand out for flooding (Figure 1), while municipios in the departments of La Paz and Cochabamba (Figure 2) stand out for landslides.



Source: IDB, 2016.

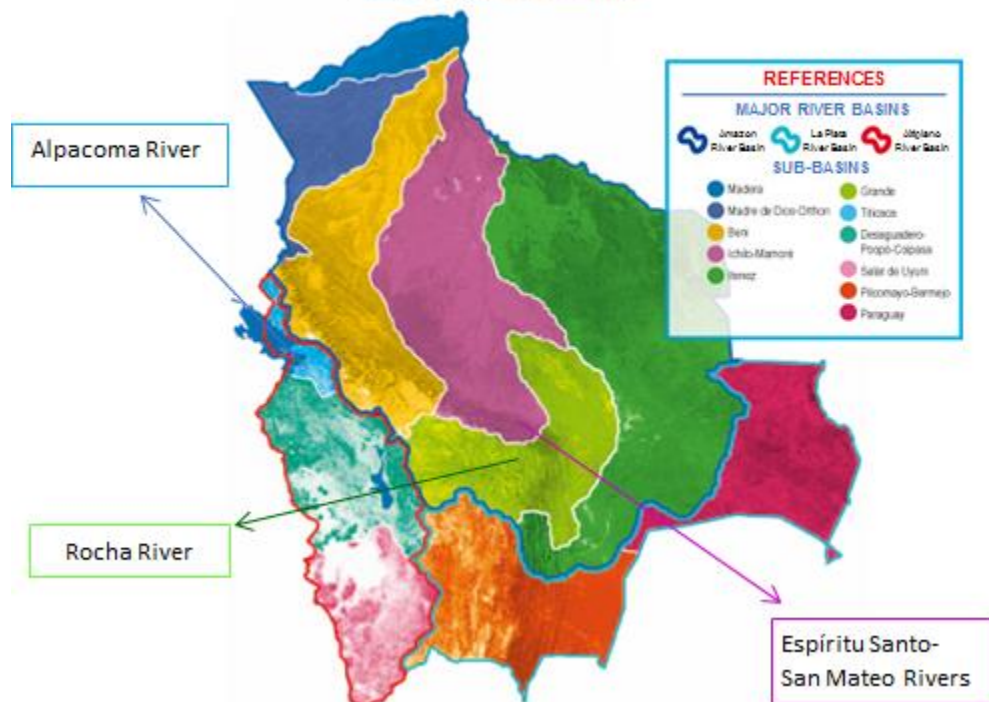
Figure 2. Landslide frequency map



Source: IDB, 2016.

Figure 3. Main river basins in Bolivia

Major river basins and sub-basins in Bolivia



Source: Food and Agricultural Organization (FAO), 2017.

- 1.6 **Disasters and poverty in Bolivia.** The departments most susceptible to climate-related disasters have high levels of poverty that are exacerbated by the impact of recurring disasters. Three of these departments—Cochabamba, La Paz, and Beni—have poverty rates of 41.9%, 37.8%, and 39.6%, respectively.⁵ The program's baseline shows that the 2007-2017 average loss from flooding represents 27% of the average annual income of the poor and 10.7% of the average annual income of the nonpoor.
- 1.7 **Causes of the problem.** The cause of the increase in poverty linked to climate disasters is the lack of resilience in areas exposed to hazards. Resilience is understood as the ability of a system, community, or society exposed to hazards to resist, absorb, contain, adapt, change, and recover from the effects of a hazard in a timely and efficient manner through the preservation and restoration of its essential basic structures and functions through DRM ([UNISRD, 2017](#)).
- 1.8 DRM is an indispensable development policy to ensure territorial sustainability and safety, as well as collective rights and interests; thus, it is intrinsically associated with safe development planning and sustainable territorial environmental management at all levels of government. In keeping with the study on disaster risk and risk management indicators ([optional link 4](#)), Bolivia has a risk management index (RMI) of 25.51, which corresponds to unsatisfactory performance. Of note is the country's poor performance in the "vulnerability and risk assessment" and "implementation of hazard-event control and protection techniques," considering that risk studies are the cornerstone for designing cost-effective risk reduction measures (Kerjan et al., 2012 and Yamin et al., 2013) and that key actors for climate risk management in basins, such as the Ministry of the Environment and Water (MMAyA), and departmental and municipal governments, have limited capacity. Accordingly, the program will support conducting risk assessments as the basis for designing investments in climate risk reduction.
- 1.9 In the areas of Bolivia that are most susceptible to disasters, such as Cochabamba, there has been intensive change in land use—especially as it relates to rapid urban growth, infrastructure development in areas at risk, and environmental degradation of watersheds. This is contributing to increasing physical exposure and vulnerability of the poorest, who generally live in informal settlements in areas exposed to natural events like landslides and flooding ([optional link 5](#)).
- 1.10 **Proposed solution.** Between 2014 and 2016 Bolivia undertook significant reforms to improve governance and financial capacity for DRM. In fact, Bolivia's General Framework of Governance for DRM achieved a grade of very good in 2016.⁶ This reform, which was supported by the Bank through two policy-based loans (3487/BL-BO and 3666/BL-BO), allowed the country to: (i) modernize its institutional structure for DRM, defining responsibilities for different ministries and levels of government; (ii) establish financial instruments for DRM; (iii) include DRM in planning and public investment; and (iv) promote a basin-based approach to risk management, to which end the role of key actors like the MMAyA and Entidades

⁵ Prepared by authors based on the 2015 National Household Survey.

⁶ Measured by the General Framework of Governance for DRM subindex from the Index of Governance and Public Policy in Disaster Risk Management (iGOPP), which was 51% in 2014, a classification of good, increasing to 85% in 2016 with a classification of very good.

Territoriales Autónomas [autonomous subnational governments] (ETAs) is key. As a result of these reforms, a specific investment fund was created for DRM, and a Planning Law and a Preinvestment Guide that incorporate DRM were approved, among other things. This program constitutes the implementation of a basin-level prospective approach to the new DRM legal framework adopted with the reform. This approach includes measures to improve resilience to climate risks through risk reduction in areas susceptible to disasters, based on appropriate identification of these risks and capacity-building for proper management of DRM knowledge, aspects which the RMI has identified as key factors to enhance performance in this policy's implementation (paragraph 1.24).

- 1.11 **Climate risk reduction.** The starting point for reducing disaster risk and promoting a culture of resilience is to analyze disaster risk and vulnerabilities (UNISRD, 2011). The program would conduct risk studies using state-of-the-art probabilistic techniques (Kerjan et al., 2013) to characterize climate risk. Based on these studies, critical points will be identified in basins that are susceptible to flooding and landslides, and mitigation measures will be proposed that use hazard-event control and protection techniques suited to the local context, including ecosystem-based adaptation solutions (reforestation). As a supplement to the mitigation measures to manage residual risk, community early warning systems (EWS) will be put in place. These systems have shown to be the most effective and sustainable option (paragraph 1.13).
- 1.12 **Climate risk knowledge management.** Local DRM and climate change adaptation (CCA) activities should go hand in hand with national, subnational, and local capacity-building (Kuriakose et al., 2013). Thus, the program proposes bolstering capacities in institutions and government levels that are engaged in DRM on key issues such as advanced risk assessment techniques and inclusion of these assessments in local development planning.
- 1.13 **Effectiveness of outcomes.** Different studies show the high cost-benefit ratio of generating and disseminating information related to disaster risk, with ratios of up to US\$15 of benefit for every dollar invested (UN, 2010). There is ample evidence that risk reduction, by lowering low-income individuals' loss of assets, leads to less income inequality (Hallegatte et al., 2017). Furthermore, institutional capacity-building to help governments address disaster risk reduction and CCA has an impact on the way climate risks affect households and may facilitate or hinder the respective responses (Kuriakose et al., 2013). Along the same lines, the Intergovernmental Panel on Climate Change (IPCC) recommends bolstering institutional capacity to support climate resilience processes (IPCC, 2014). The IPCC also proposes that successful strategies include a combination of structural mitigation measures together with nonstructural solutions, such as institutional capacity strengthening and ecosystem-based adaptation (Field, 2012). As for EWS, it is estimated that these systems prevent hundreds of deaths a year and asset losses of between 460 million to 2.7 billion euros per year from hydro-meteorological related-disasters in Europe (Hallegatte, Stéphane, 2012). In Bangladesh, there is evidence that Cyclone Sidr in 2007 caused fewer deaths (around 3,400) than other similar storms (Gorki had a death toll of more than 140,000 in 1991) due to good storm forecasting, which enabled flood warnings to be issued swiftly, thus creating conditions for timely evacuation (Paul, B. K., 2009).

- 1.14 **The Bank's knowledge of the sector.** The program's design takes into account the experiences of an array of Bank projects with respect to risk studies that support the selection of intervention zones, design of mitigation works, community-based EWS, and the inclusion of DRM in development plans ([optional link 6](#)).
- 1.15 **Alignment between disaster risk management and climate change adaptation.** As regards synergies between DRM and CCA, the program is aligned with the IPCC opinion expressed in the special report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (Field, 2012), which acknowledges that for extreme events the principal way that climate change manifests itself locally is in the form of risk. Therefore, for this reason, DRM activities are essential for CCA when the risk at hand stems from extreme climate events. On this point, the program has been designed taking into account the three main recommendations from the Office of Evaluation and Oversight's Thematic Evaluation ([optional link 7](#)), which are to: (i) define strategies that properly conceptualize DRM and CCA in an integrated climate risk management framework; (ii) provide guidance to client countries through studies that allow for better risk assessment at project design; and (iii) focus on institutional capacity-building activities both at the national and at the subnational level, especially through prevention and preparedness.
- 1.16 **Strategic alignment.** This operation is aligned with the Update to the Institutional Strategy 2010-2020 (document AB-3008) and the Corporate Results Framework 2016-2019 (document GN-2727-6). Specifically, it addresses the development challenges of "productivity and innovation" and "social inclusion and equality" and the crosscutting theme of "climate change and environmental sustainability", through the results indicator "beneficiaries of improved management and sustainable use of natural capital" by increasing infrastructure and human resilience to disasters and climate change and the crosscutting issue "institutional capacity and rule of law" through the results indicator "government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery." The operation is further aligned with the strategy Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5), specifically, with its priority action area, "support the construction and maintenance of socially and environmentally sustainable infrastructure, thus enhancing quality of life," through actions that will contribute to safe and more resilient infrastructure. The operation is included in the 2017 Operational Program Report (document GN-2884) and is aligned with the Bank's Country Strategy with Bolivia 2016-2020 (document GN-2843), through the strategic area "increasing productivity and diversification in the economy" and the strategic objective "reduction in vulnerability to climate change and natural disasters." This program is one of the five pillars of the National Employment Plan announced by the President of Bolivia in May 2017, which includes labor-intensive risk reduction interventions (paragraph 1.26).
- 1.17 The program is consistent with the Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy (document GN-2609-1) and the Climate Change Sector Framework Document (document GN-2835-3). 100% of the operation's funding is invested in climate change activities, in accordance with the multilateral development banks' joint [methodology](#) for estimating climate finance. This funding contributes to the IDB

Group's target of increasing financing for climate change-related projects to 30% of all approved operations by the end of 2020.

B. Objectives, components, and cost

- 1.18 **Objective.** The objective of the program is to improve Bolivia's resilience to climate risks. The specific objectives are to: (i) improve management and sustainable use of natural capital by implementing risk reduction and CCA measures; and (ii) enhance knowledge about climate risks among public agencies responsible for risk identification, land-use planning, and public investment management.
- 1.19 **Component I. Climate risk reduction (US\$36.9 million).** This component will finance: (i) climate risk studies that consider the effects of climate change, as an input for identifying and designing risk reduction and CCA measures; (ii) design, investment management, and execution of risk reduction and CCA works that use climate hazard-event control and protection techniques suited to the local context, including ecosystem-based adaptation solutions, such as: gabions, dike protection, floodtide-regulation works, irrigation channel recovery, river-bank stabilization, draining- and erosion-control, reforestation, reservoirs for flood abatement, and channel works, among others; (iii) preparation of operational and maintenance protocols for risk reduction and CCA works to ensure their sustainability and training of the local individuals responsible for them; (iv) community-based EWS that complement the risk reduction and CCA works; and (v) environmental awareness-raising (including about DRM) that targets the population in the intervention areas in order to support the sustainability of the works. The beneficiaries of this component will be the vulnerable populations in the prioritized areas' critical points.
- 1.20 This component's risk reduction and CCA works have been conceived under the multiple-works modality. To this end a sample has been prepared that corresponds to 47.01% of the budget for these projects. The projects comply with the eligibility criteria for the program's risk reduction and CCA works (paragraphs 1.24 to 1.30). The rest of the projects to be financed will be determined by the MMAyA in keeping with the criteria referenced in paragraph 1.26 that were used to establish the representative sample.
- 1.21 **Component II. Climate risk knowledge management (US\$700,000).** Component II will finance the following activities: (i) training in climate risk analysis; (ii) training in integrating the DRM and CCA approach into comprehensive departmental development plans and ETAs' annual work plans; (iii) preparation of the action plan for the hydrological risk components of the National River Basin Plan; (iv) strengthening of the MMAyA's Hydrological Risk Unit in risk analysis; and (v) characterization study of the native, indigenous, and multicultural population and its exposure to risk as an input for designing more inclusive evidence-based DRM public policies. The beneficiaries of this component's strengthening activities will be officials and experts from the following agencies: (i) ETAs and central government institutions involved in climate risk analysis; and (ii) agencies responsible for including DRM and climate change in land-use planning instruments.
- 1.22 **Administration, auditing, and evaluation (US\$2.4 million).** This includes technical and administrative personnel, auditing, the program's midterm evaluation of execution, final evaluation, and impact assessment.

- 1.23 **Cost and financing.** The total cost will be US\$40 million, with US\$34 million from the Bank's regular Ordinary Capital (OC) and US\$6 million from the concessional OC. The budget breaks down as follows:

Table 1. Budget breakdown

Description	IDB (US\$ million)	%
Component I. Climate risk reduction	36.9	92.3
Component II. Climate risk knowledge management	0.7	1.7
Administration, auditing, and evaluation	2.4	6.0
Total	40.0	100

- 1.24 **Intervention areas and beneficiaries for the sample.** The sample intervention areas were selected based on existing risk studies ([optional link 3](#); [optional link 8](#)) and include the Rocha and Alpacoma basins in the departments of Cochabamba and La Paz, respectively.
- 1.25 **Representative sample.** The sample amounts to a total of US\$15.63 million, or 47.01% of the program's budget for works (US\$33.25 million). It includes interventions in the departments of Cochabamba (municipios of Cochabamba, Colcapirhua, Quillacollo, Vinto, and Sipe Sipe) and of La Paz (municipio of Achocalla).
- 1.26 **Selection criteria for works to be financed.** The criteria include that: (i) the works will be useful for reducing the risk of flooding and landslides. To determine the risk, a study is needed to analyze the natural hazards in the intervention area, as well as the exposure and vulnerability of the population and assets; (ii) the risk can be mitigated through labor-intensive interventions,⁷ without ruling out the use of machinery when required to achieve the objective of reducing risk; (iii) the intervention in each area will have a cost-benefit ratio acceptable under the Bank's current regulations; and (iv) each intervention will be classified as Category "C" or Category "B" in keeping with the Bank's Environment and Safeguards Compliance Policy (OP-703).
- 1.27 The Rocha River sub-basin is Bolivia's most critical with respect to flooding ([optional link 9](#)). It crosses Cochabamba, the fourth most populated city in Bolivia, and is located in the Rio Grande basin—the largest and most populated—where great development potential co-exists with a significant issue of disaster risk. The high rates of erosion and landslides in the upper basin produce a large amount of sediment that is deposited in the middle and lower parts of the basin, reducing the river's hydraulic section and causing flooding. According to data from Desinventar, the department of Cochabamba reported that as a result of flooding from 2000 to 2014, there were approximately 368,257 individuals affected, with more than 2,000 evacuees, and 117 dead.
- 1.28 The area susceptible to flooding in the Rocha basin, located in the municipios of Cochabamba, Colcapirhua, Quillacollo, Vinto, and Sipe Sipe, is 49 km² and has

⁷ An intervention is understood as the set of works implemented to reduce risk in an integrated manner in a single intervention area.

58,473 inhabitants, 25 km² of croplands, and 13,635 buildings exposed to flooding. As part of the program design, the 2016 IDB study ([optional link 10](#)) was updated for this basin (paragraph 1.5), revealing a probable maximum loss value of US\$17 million for an event with a return period of 100 years. The flood mitigation works financed by this program will benefit 8,807 people in five municipios, most of whom live in poverty. Indeed, the poverty rate there is 57%, higher than the national average of 34%. The average monthly rent price (typically used as a proxy for capital accumulation) is Bs 495, less than 47% of the national average. The monthly income in Rocha is Bs 1,180 per inhabitant, or 75% of the monthly income per capita in the country's urban areas. Annual losses caused by flooding in the Rocha basin equal 20% of average household income.

- 1.29 The Alpacoma River basin is southwest of La Paz in the Department of La Paz. According to data from Desinventar, from 2000-2015 this department reported that landslides affected approximately 100,000 people and 8,700 hectares of forest and cropland, destroyed 1,192 homes and damaged more than 2,000 others, and killed 61 people.
- 1.30 This basin's unstable terrain and steep slopes contribute to landslides when the soil becomes saturated from rain. The Alpacoma comprehensive basin management study ([optional link 8](#)) identified 31 areas affected by landslides: 6 in the municipio of El Alto and 25 in Achocalla. In all, 32,632 people are exposed to landslides. The landslide mitigation works financed by this program will benefit 2,206 residents of Achocalla, where there is considerable poverty. The poverty rate in the Alpacoma basin is 37%, which is above the national average of 34%. The average monthly rent price is Bs 552, less than 52% of the national average. The average monthly income in the Alpacoma basin is Bs 1,339 per inhabitant, or 85% of the monthly per capita income in the urban areas of the country. The annual losses caused by landslides in the basin equal 29% of average household income.

C. Key results indicators

- 1.31 **Expected outcomes** (Annex II). The indicators of the program's impact are a reduction in economic losses from climate disasters and an increase in household income in the selected basins.
- 1.32 The program's expected results indicators are:

Table 2. Key results indicators

Expected outcomes	Indicators
Component I. Climate risk reduction	
Outcome 1.1. Reduced climate risk in priority basins.	Reduction in expected annual economic losses from flooding per inhabitant in the project's areas of influence.
	Reduction in expected annual economic losses from landslides per inhabitant in the project's areas of influence.
	Total number of households benefiting from improved management and sustainable use of natural and cultural capital.
	Percentage of the population in the intervention areas that have enhanced their knowledge about environmental issues.
Outcome 1.2. Bolivia's improved performance in identifying risk.	Increase in the RMI-RI-4 (Risk Identification Subindex 4 of the Risk Management Index).
Component II. Climate risk knowledge management	
Outcome 2.1. Improved technical capacities for climate risk assessment and its use in development planning.	Increase in central government and ETA personnel's knowledge about techniques for probabilistic climate risk assessment.
	Number of planning tools that include risk analysis.
	Number of government agencies benefitting from projects that strengthen technological and managerial tools to improve public service delivery.

- 1.33 **Economic viability.** An economic analysis ([optional link 11](#)) was conducted to evaluate the viability of measures to reduce risk from flooding and landslides, considering a discount rate of 12% and an evaluation horizon of 15 years for the sample corresponding to 46.88% of the budget allocated to risk reduction works. This sample is representative in terms of the typology, design, and eligibility criteria of all the projects financed under the program as a whole. In general, the net present value (NPV) of 100% of the works assessed at social prices is greater than US\$36.9 million. The internal rate of return (IRR) is 39.9%. The benefits stemming from the flood mitigation projects equal a net gain of US\$36.7 million, while for the landslide mitigation projects it is US\$300,000. According to the sensitivity analysis, the NPV attributable to these projects is consistently calculated at between US\$16 million and US\$61.6 million, with an IRR ranging from 14.6% to 162.2%. Even under the most conservative assumptions, in which impacts are estimated to be under the values suggested in the literature, the economic analysis supports the program as an economically viable investment.
- 1.34 **Technical viability.** The technical viability of the works from the representative sample was analyzed and reviewed based on the studies and designs done ([optional link 12](#)); these are standard works with proven implementation methods.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

- 2.1 **Modality.** Outputs 1, 2, and 4 of Component I will be structured under the multiple-works modality (paragraph 1.20), which finances works that are similar but independent of one another and uses a representative sample of projects. (paragraphs 1.25 and 1.26). The program will have a five-year execution period. All works under the program are expected to begin within the first four years of execution given the time required to conduct risk studies, design works, adjust designs based on public consultation, and call for tendering processes. The disbursement schedule is as follows:

Table 4. Disbursement schedule

SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
	2nd half 2018	2019	2020	2021	2022	1st half 2023	
IDB (US\$ million)	1.0	12.6	9.9	10.0	5.0	1.5	40.0
%	2.6%	31.4%	24.8%	25.0%	12.6%	3.6%	100%

B. Environmental and social risks

- 2.2 In keeping with the Bank's Environment and Safeguards Compliance Policy (OP-703), this is classified as a Category "B" operation with moderate disaster risk. The due diligence process confirmed that adverse environmental and social impacts would principally be local and short term, for which there are mitigation measures. The investments are expected to produce a positive environmental and social effect on the quality of life and well-being of the beneficiaries and the environment. The following medium-level risks were identified: (i) opposition from residents or those affected by the projects' execution, for which there is a community relations plan that includes information activities at different stages, including consultation on final designs of the works; (ii) delay in obtaining projects' environmental permits from the municipios for which intergovernmental agreements and inclusion of personnel for their management are provided for; and (iii) natural disasters and other contingencies during the construction phase for which precautions will be taken in the bidding information, maintenance of works, and training of beneficiaries.
- 2.3 The projects in the sample (paragraphs 1.24 to 1.30) are exposed to type 1 disaster risk⁸ and have an environmental and social analysis and management plan (ESA/ESMP). The Alpacoma project does not have significant adverse socioenvironmental impacts, and the ones it does have are mostly temporary or limited to the direct area of influence. The project in Rocha, however, potentially has considerable impacts such as soil contamination from sediments and polluted materials from the river (due to human activities), generation of domestic effluents and solid waste from the high number of personnel at the project, damage to the vegetation in the riverbed and riverbank, and generation of plant debris. The ESMP has prevention and mitigation plans for each of these potential impacts.

⁸ When the project is exposed to natural risks due to its geographic location.

- 2.4 The due diligence process identified insignificant impacts related to the resettlement policy in the projects in the sample (most of which were partial temporary impacts on crops, partial impacts on structures, and impacts on two houses that will entail displacement on the same plot of land). For this reason, a resettlement plan was prepared in keeping with operational policy OP-710. The works will be done within the buffer zone of the Rocha River. These impacts may be reduced with the works' final designs. Consultations were conducted on the resettlement plan, in accordance with operational policies OP-710 and OP-765. Even though no potential significant adverse impacts on the indigenous population were identified, an agreement was reached on compensation measures and consultations as part of the update to the resettlement plan when the final designs are in place.
- 2.5 The Environmental and Social Management Framework (ESMF) will guide future projects selected under this operation. It includes detailed procedures for conducting socioenvironmental impact assessments, guidelines to apply operational policy OP-765, and a resettlement framework, which is part of the program's Operating Regulations ([optional link 13](#)), to ensure each project complies with IDB policies. The eligibility criteria for future projects under this program exclude Category "A" projects (paragraph 1.26).
- 2.6 Appropriate sociocultural consultations took place in six municipios where projects from the sample will be executed, in addition to consultations on the resettlement plan with those directly affected in the Rocha sub-basin. The final versions of the ESMF, ESA, ESMP, and resettlement plan have been posted on the Bank's website.

C. Fiduciary risks

- 2.7 Both the National Productive and Social Investment Fund (FPS), as well as the MMAyA, through the Unidad de Coordinación y Ejecución Más Inversión para Riego [More Investment for Irrigation Coordination and Execution Unit] (UCEP), have experience managing IDB-financed projects. In general, these institutions' performance in fiduciary management of projects has been satisfactory. However, considering that both agencies have a large number of projects in their respective portfolios, a medium fiduciary risk has been identified. This risk is due to potential delays in the fiduciary management of the program as the result of the additional work load created by the program's inclusion in their respective portfolios, and the limited availability of fiduciary specialists with experience in managing IDB policies. Mitigation measures that have been taken are: (i) inclusion of two specialists (procurement and financial administration) in the UCEP; and (ii) training of UCEP and FPS personnel in procurement and financial management under IDB policies.
- 2.8 Both executing agencies will include in their program Operating Regulations a procedure for implementing maintenance plans for goods and works to be procured for the program. For the FPS alone, the audit functions will also include verification of inventory and control of goods.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation arrangements

- 3.1 **Borrower and executing agency.** The Plurinational State of Bolivia will be the borrower. The MMAyA will be the executing agency and will act through the UCEP,⁹ which will have a specific technical team working full-time on program execution. The UCEP's head will be the principal contact between the Bank and the borrower during execution. The FPS will be the coexecuting agency and will be responsible for contracting the works' execution and for their technical oversight as provided for in outputs 1, 2, and 4, based on the portfolio of projects that MMAyA will approve. The FPS will likewise be responsible for preparing maintenance protocols for the investments envisaged in output 5, under Component I.
- 3.2 For the program's management, an Executive Coordination Committee will be created as a permanent body of the Viceministry of Water Resources and Irrigation (VRHR). The Committee's goals will be to establish strategic guidelines, make high-level decisions, and provide general oversight of the program's execution. At the same time, a Technical Coordination Committee will be created, the goals of which will be to establish technical guidelines for program execution, monitor the financial and physical progress of the projects' implementation, and become the operational coordination body. Both committees will be comprised of representatives from the UCEP, IDB, FPS, and MMAyA's General Directorate of Basins and Water Resources, specifically the Unit for Hydrological Risk Management, Projects, and Strategic Issues (UGRHPT), which will act as the Committee's technical secretariat. The program Operating Regulations will establish the composition, powers, and operational protocol of these committees.
- 3.3 Save the provisions set forth in paragraph 3.4, the UCEP will be responsible for the program's general administration, which includes planning, legal management, procurement and contracting, administrative, financial, and accounting management, monitoring and evaluation, as well as technical management that will be done in close coordination with the UGRHPT. **The special conditions precedent to the first disbursement of loan proceeds will be that: (i) a MMAyA ministerial resolution has provided for approval of the program's inclusion in the portfolio of programs executed by the UCEP, which is an essential condition for formalizing the program's inclusion in the unit's existing portfolio of programs and projects; and (ii) the MMAyA has submitted evidence of the strengthening of UCEP Mi Riego, by beginning the selection process for key personnel who will participate in the program, including the technical manager, procurement specialist, financial specialist, environmental specialist, and social specialist, in keeping with the profiles established in the terms of reference previously agreed to with the Bank.** This second condition is vital given the need to have identified the candidates for three key positions from the initial stage of execution in order to ensure an effective program launch. The UCEP is also expected to have a knowledge management liaison to head up Component II, and four experts with civil engineering profiles. Two planning and monitoring specialists will also be hired, one of whom will provide services at the UCEP and the other at the FPS; they will work

⁹ Created within the MMAyA through Ministerial Resolution 253 of 17 November 2009, and amended by Ministerial Resolutions 96 of 8 April 2014, 307 of 24 August 2015, and 56 of 8 March 2016.

in close coordination for planning and monitoring and will maintain all program management tools up to date and harmonized based on the standards used by the IDB.

- 3.4 The FPS will be responsible for administrative, financial, accounting, and procurement management of Component I outputs (paragraph 3.1). It will prepare and send to the Bank, with a copy to the UCEP for information, no objection requests as part of procurement processes, financial statements, disbursement requests, and expenditure documentation related to the outputs under its responsibility. The FPS will also send the UCEP the semiannual progress reports, which will include information on the physical, financial, and socioenvironmental execution of the outputs under its responsibility, no later than 10 working days prior to the deadline for submitting these reports to the Bank. This will allow for consolidating information about the program's progress status. Additionally, the FPS will send the UCEP environmental and social reports according to the schedule established in the ESMF.
- 3.5 The UCEP will be responsible for commissioning the risk studies and designs of works for output 3 of Component I. The municipal autonomous governments will, together with the MMAyA, participate in identifying the works based on the risk studies and will be responsible for obtaining the environmental permits for them. The autonomous departmental governments, through their departmental basin services, will support and coordinate measures with the MMAyA during the preinvestment phase and with the FPS in the investment phase of the works. They will also support development of the program's other outputs, when appropriate. The UCEP will provide the FPS with the final designs of the works approved by the MMAyA and validated by the autonomous municipal governments and beneficiary population through the corresponding consultations. The autonomous municipal governments will be responsible for obtaining the environmental permits for the respective works. With these designs of the works and their respective environmental permits, the FPS will proceed to execute the outputs under its responsibility.
- 3.6 The program Operating Regulations will establish the organizational structure and functions for program execution, ensuring enforcement of the loan contract clauses and environmental legislation, coordination with municipal and departmental governments for investment operation and maintenance, as the case may be, as well as results and management indicators established for FPS service delivery, protocols for payment authorization for its services, and sanctions for potential infringements. The FPS will provide the UCEP and the Bank access to the DataGen, iSAP, APK, and other monitoring systems, as appropriate, with accurate, detailed, and real time information on the physical and financial progress of the execution of outputs under its responsibility. **A special contractual condition precedent to the first disbursement of loan proceeds will be that the MMAyA has approved the program Operating Regulations, which include the Environmental and Social Management Framework (ESMF) in its annexes, under the terms previously agreed to with the FPS and with the Bank's prior no objection, and that these Regulations have entered into force.** Given the complexity of the program's execution mechanism, this condition is vital for ensuring the proper establishment of the organization, functions, levels of authority, and norms of relevant dimensions of program execution.

- 3.7 During the first year of execution, the FPS will conclude its organizational reengineering process, formalizing the new management tools (organizational documents) that have been developed. These tools include the structural organization chart, operating manual, manual of organization and functions, manual of operations, the annual individual work programming forms that establish each position's functions and responsibilities, as well as their specific profiles, and the processes and formalization of procedures governing project operation and execution at the FPS.
- 3.8 **Special execution conditions:** Prior to the call for tenders for works, each autonomous departmental or municipal government involved will sign an intergovernmental agreement with the MMAyA and FPS establishing the parties' obligations in executing the program, including maintenance of the works, in keeping with the provisions of the [program Operating Regulations](#).¹⁰ This condition seeks to appropriately ensure that participating autonomous departmental and municipal governments undertake their responsibilities in executing the program and operating and maintaining the works once completed.
- 3.9 **Retroactive financing.** The Bank may retroactively finance from the loan proceeds eligible expenditures made by the borrower prior to the loan's approval date on works, consultants for risk studies and works designs, and administrative expenses, for up to US\$8 million (20% of the proposed loan amount), provided they meet requirements substantially similar to those set out in the loan contract. These expenditures must have been made on or after 16 February 2017 (the project profile approval date), but will not under any circumstances include expenditures made more than 18 months prior to the date the loan is approved.
- 3.10 **Procurement of goods and contracting of works and services.** Goods will be procured and works and services contracted with loan proceeds in accordance with the Policies for the Procurement of Goods and Works financed by the Inter-American Development Bank (document GN-2349-9) and Policies for the Selection and Contracting of Consultants financed by the Inter-American Development Bank (document GN-2350-9), both from March 2011. Bank oversight of goods procured and works and services contracted with program funding will be carried out in keeping with the provisions of Annex III of this document and the current procurement plan.
- 3.11 **Financial statements.** During program execution, the borrower will annually submit to the Bank the project's financial statements duly issued by an independent auditing firm acceptable to the Bank, within 120 days of the end of the borrowers' corresponding fiscal year. The project's last audited financial statements will be submitted to the Bank within 120 days following the last loan disbursement. The auditing firm will be selected and contracted in keeping with the Financial Management Guide for IDB-financed Projects (document OP-273-6) and the Manual

¹⁰ These obligations include, among others: (i) the municipio's responsibility to obtain the environmental permits in a timely fashion according to the works' schedule; (ii) where applicable, the municipio's issuance of the municipal resolution expropriating land where works will be built; (iii) where applicable, ensure the municipio's timely appropriation of budget and financial resources to fund social offsets in the area of the municipio where the intervention will take place; and (iv) ensure the municipio's appropriation of budget and financial resources to fund the future operation and maintenance of works once they have been delivered to the municipio.

for Audited Financial Reports and External Auditing Management (May 2017). Audit costs will be paid for with loan proceeds.

B. Summary of results monitoring arrangements

- 3.12 The system to monitor and evaluate impact is comprised of: (i) the [Project Execution Plan](#), which includes the [Procurement Plan](#); (ii) the indicators established in the Results Matrix; (iii) the [annual work plans](#) (AWP) that in turn include necessary and agreed upon measures to mitigate risks, which the Bank will review periodically; (iv) semiannual progress reports and the Program Monitoring Report (PMR), which includes the progress made on the AWP and the outcomes obtained in executing activities; (v) the cash flow and disbursement programming; (vi) performance evaluations; (vii) midterm performance evaluations; and (viii) the project completion report (PCR), including the ex post socioeconomic and impact assessment. A breakdown of these activities is presented in the [Monitoring and Evaluation Plan](#).
- 3.13 The impact assessment will identify the effects attributable to the program in terms of reducing damages from flooding and landslides. The assessment will be based on quasi-experimental methods (entropy balancing using the difference-in-differences technique) to create a counterfactual scenario. This assessment represents one of the first efforts to estimate risk empirically using primary information, offering an innovative methodological approach for rigorous quantitative risk assessment, which has traditionally turned to Monte Carlo simulations and construction of synthetic scenarios. In contrast to other hazards with long periods of return—which probably will not arise during the life of the project and thus hinder attributing impact to the project—this program will mitigate the adverse effect of high frequency phenomena, meaning that the risk of inevaluability due to the absence of a disaster is very small. The baseline survey, which gathers information for 2007-2017 in the program's area of influence, shows that the events in the intervention area are sufficiently regular. The hazard recurrence period is objectively low.

C. Post-approval design activities

- 3.14 With respect to the works in the sample, subsequent to program approval and prior to tendering bids for these works: (i) local authorities will definitively validate final designs previously validated by the population; (ii) subsequently, environmental files will be prepared and environmental permits will be processed based on the final designs the municipios have validated. With regard to the rest of the program, the same steps taken with respect to the sample will be followed: (i) preparation of studies to identify areas at greatest risk and critical points where works will be built; (ii) preparation of works' preliminary designs based on these studies; (iii) review, adjustment, and approval of preliminary designs with local authorities to proceed with public consultations; (iv) first round of public consultations; (v) changes to the preliminary designs based on the first round of consultations; (vi) final design validation by the population through a second round of consultations; (vii) definitive validation by local authorities of the designs validated by the population; and (viii) preparation of environmental files and processing of environmental permits.

Development Effectiveness Matrix		
Summary		
I. Corporate and Country Priorities		
1. IDB Development Objectives	Yes	
Development Challenges & Cross-cutting Themes	-Social Inclusion and Equality -Productivity and Innovation -Climate Change and Environmental Sustainability -Institutional Capacity and the Rule of Law	
Country Development Results Indicators	-Beneficiaries of improved management and sustainable use of natural capital (#)* -Government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery (#)*	
2. Country Development Objectives	Yes	
Country Strategy Results Matrix	GN-2843	Reduce vulnerability to natural disasters and climate change.
Country Program Results Matrix	GN-2884	The intervention is included in the 2017 Operational Program.
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability	Evaluable	
3. Evidence-based Assessment & Solution	10.0	
3.1 Program Diagnosis	3.0	
3.2 Proposed Interventions or Solutions	4.0	
3.3 Results Matrix Quality	3.0	
4. Ex ante Economic Analysis	10.0	
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis	4.0	
4.2 Identified and Quantified Benefits	1.5	
4.3 Identified and Quantified Costs	1.5	
4.4 Reasonable Assumptions	1.5	
4.5 Sensitivity Analysis	1.5	
5. Monitoring and Evaluation	10.0	
5.1 Monitoring Mechanisms	2.5	
5.2 Evaluation Plan	7.5	
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood	Medium	
Identified risks have been rated for magnitude and likelihood	Yes	
Mitigation measures have been identified for major risks	Yes	
Mitigation measures have indicators for tracking their implementation	Yes	
Environmental & social risk classification	B	
IV. IDB's Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	Yes	Financial Management: Budget, Treasury, Accounting and Reporting. Procurement: Information System.
Non-Fiduciary		
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Gender Equality		
Labor	Yes	Criteria for selection of public works favors labor-intensive modalities.
Environment	Yes	The representative project sample includes adaptation solutions based in ecosystems.
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project		
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan	Yes	The causal effect of the program will be estimated using entropy balancing/psm with diff-in-diff to evaluate the impact of mitigation infrastructure on economic losses.

Note: (*) Indicates contribution to the corresponding CRF's Country Development Results Indicator.

In the face of Bolivia's high level of exposure to natural disasters (including floods, landslides, and droughts) and the likely deterioration of these hydro-meteorological events due to climate change, this program seeks to increase the country's resilience to climate risks and reduce economic losses. To achieve this, the operation proposes to strengthen the physical infrastructure in the most vulnerable zones (under the modality of multiple works), increase the environmental awareness of the affected population, and provide institutional strengthening for an integrated climate risk management.

The documentation is well-structured. The diagnostic is based on empirical evidence of the high occurrence of natural disasters and its adverse effects on infrastructure and the productive capacity of the country's most vulnerable population. The proposed solution is then linked to the problems identified. The results matrix (RM) reflects the objectives of the program and establishes a clear vertical logic, including impact indicators that can capture the program's overall effect on reduced economic losses and increases in household income among the beneficiary population. The RM includes SMART indicators at the impact, outcome and output level, with their respective baseline values and targets and the means to gather information.

The economic analysis includes a Cost-Benefit Analysis that considers the benefits of a sample of already identified infrastructure works in terms of avoided losses. In general, the benefits are based on a good understanding of the theory of change, and the economic costs include all resource costs as well as costs from a social perspective. Overall assumptions appear reasonable and appropriate; a sensitivity analysis contemplates key parameters and takes into account the additional cost of the program's second component.

The monitoring and evaluation plan presents all outputs and associated costs. The evaluation plan proposes a quasi-experimental approach that relies on spatial data to select participants of the treatment and control group to conduct a difference-in-difference analysis. The plan provides sufficient detail on methodological and logistical considerations. Given the current lack of rigorous evidence of the impact of such climate risk management interventions, the proposed evaluation promises to make an important contribution to the literature and to future policy design.

The risk matrix identifies seven risks; three are classified as Low, and four as Medium. All of them seem reasonable and include appropriate mitigating actions and compliance indicators.

RESULTS MATRIX

Program objective			Make Bolivia more resilient to climate risks.								
IMPACT											
Impact: Improved resilience to climate-related disasters in selected intervention areas											
Indicator	Unit of measure	Baseline	Baseline year	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half of 2023)	End of project	Means of verification
Reduction in average economic losses per household from climate-related disasters in selected basins	% change	0	2014-2016							70 (2020-2023)	Baseline surveys and monitoring in selected basins
Average annual income of families in selected basins	US\$	6,656	2017							7,494	Baseline surveys and monitoring in selected basins. Amounts at the end of the project derived from lower limits of estimates presented by Carter et al. (2004), Kellenberg and Mobarak (2008), and Morris et al. (2001), using OLS and ZINB regression models for income and asset recovery.

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country: Plurinational State of Bolivia
Name: Bolivia Resilient to Climate Risks
Executing agency: Ministry of the Environment and Water (MMAyA) and National Productive and Social Investment Fund (FPS)
Prepared by: Patricia Toriz Monroy, Shirley Foronda (FMP/CBO)

I. EXECUTIVE SUMMARY

- 1.1 The MMAyA will be responsible for program execution, with the exception of some Component I outputs that will be coexecuted by the FPS.
- 1.2 To this end, the Institutional Capacity Assessment System (ICAS) analysis was conducted of both the MMAyA—specifically the UCEP—and the FPS.
- 1.3 The ICAS found that the MMAyA's UCEP had satisfactory institutional capacity development, associated with a low risk level for program execution. The FPS was found to have a medium level of institutional capacity development and a medium risk level for program execution.
- 1.4 Financial management will be handled through the National Public Management System (SIGEP). For financial reports required by the Bank, the UCEP will use the IDB Project Administration System (SIAP-BID) and the FPS will use its own iSAP system. The Sistema de Cuenta Única del Tesoro [Single Treasury Account System] (CUT), which will also be used, has a national scope and manages both local and foreign currency.
- 1.5 For procurement management, either standard Bank procurement documents will be used or the documents agreed upon with the Viceministry of Public Investment and External Financing (VIPFE), which are available through the Sistema de Contrataciones Estatales [State Contracting System] (SICOES).¹
- 1.6 Advertising of international public tenders and selection of international consultants (announcements, requests for expressions of interest, clarifying circulars, amendments, and results of the processes) will be done through the United Nations Development Business website; the SICOES website and/or national daily newspapers may also be used for these processes and all others.
- 1.7 An agreement is currently being signed between the Government of Bolivia and the Bank, which will allow for partial use of the Normas Básicas del Sistema de Administración de Bienes y Servicios [Basic Standards of the Goods and Services

¹ [State Contracting System](#). Packet of bidding documents authorized by the Bank for processes below the ICB thresholds.

Administration System] (NB-SABS) in Bank-financed operations in Bolivia; once the agreement takes effect, it could apply to this program.

II. THE EXECUTING AGENCY'S FIDUCIARY CONTEXT

- 2.1 Law 1178 on Government Management and Oversight of 20 July 1990, known as the SAFCO Law, regulates management and oversight systems for government resources and their relationship with national planning and public investment systems. It establishes subsystems for planning (operational programming, administrative organization, and budget), execution (treasury, public credit, integrated government accounting, personnel management, management of goods and services) and government oversight (internal and external control). This law is mandatory both for the MMAyA and the FPS.
- 2.2 Although the systems contribute to transparent and comprehensive execution of public finances, there are areas in which it needs continued strengthening, such as:
- 2.3 **Management of goods and services (procurement).** Save for the provision established in paragraph 1.5, the use of the NB-SABS is not acceptable for the Bank. Both entities, in keeping with paragraph 1.3, are to have the fiduciary capacity to undertake the activities related to their component of execution.
- 2.4 **Budget.** Bolivia has no multiyear budget system. As a result, the program's budget must be entered annually (external and treasury resources).
- 2.5 **Government accountability.** SIGEP provides secure, reliable information on budget execution. However, the information it furnishes is only in local currency and does not match the program's investment categories. Currently, the IDB is supporting an MEFP initiative to implement a project accounting module within SIGEP. This initiative is now in the pilot phase, and it is expected to enter into production in 2018. The new module will be able to issue financial reports acceptable to the Bank.
- 2.6 **Government oversight.** Government oversight falls to the Office of the Comptroller General. This office is currently facing technical and personnel limitations in conducting ongoing and timely reviews of projects financed with funds from multilateral cooperation organizations.

III. FIDUCIARY RISK EVALUATION AND MITIGATION ACTIONS

- 3.1 The institutional capacity assessment yielded a low risk level for the MMAyA's UCEP due to its experience executing projects with external financing, including from the IDB, as well as its satisfactory performance in executing those projects. The FPS received a medium risk level mainly due to its planning and organization capacity, which is why specific mitigation measures need to be taken.
- 3.2 Considering that both entities have a considerable number of projects in their portfolios, the inclusion of the program adds to this work load. For this reason, the Risk Mitigation Plan² provides for the need to strengthen the operation with

² The Project Risk Management Matrix includes the risk mitigation action plan.

- technical and fiduciary personnel who solely work in the procurement and finance areas, to minimize potential delays in the program's fiduciary management. Given the limited availability of fiduciary specialists with experience in managing IDB policies, specific training for strengthening this new personnel is planned, to enhance their expertise.
- 3.3 With regard to procurement, by ICAS recommendation, both executing agencies will include in the program Operating Regulations a procedure for implementing maintenance plans for goods and works that the program will procure. It was also recommended, exclusively for the FPS, that the audit functions include verification of oversight and inventory of goods.
- 3.4 SIGEP, the national public management system, will be used for the project's financial management. The structure of the integrated government chart of accounts in SIGEP allows for recording expenditures according to budget line items and for managing an appropriate system for expenditure recording and monitoring. SIGEP also allows for administering program funds, which are managed in the CUT through passbooks. This system is an adequate basis for external auditors to be able to issue an opinion on the accounting records; however, it does not create financial execution reports in keeping with the loan's cash flow statement (investment category, currency type, accounting basis, etc.). Thus, a supplementary system is required—in this case the SIAP-BID for the UCEP and the iSap for the FPS—that allows for recording expenditures and creating reports that are acceptable to the Bank.

IV. CONSIDERATIONS FOR THE SPECIAL PROVISIONS OF THE CONTRACT

- 4.1 **Program Operating Regulations.** The program Operating Regulations for each executing agency will include its execution system, information flows, and procedures, previously agreed upon with the Bank.
- 4.2 **Exchange rate agreed upon for accounting purposes.** Both the UCEP and the FPS will use the exchange rate in force in Bolivia on the effective date proceeds are converted from foreign currency to local currency in the accounts of each executing agency.
- 4.3 **Financial statement and other audited reports.** For the duration of the loan disbursement period, audited program financial statements will be submitted to the Bank within 120 days after the close of the executing agency's fiscal year. These statements will be duly audited by an independent audit firm acceptable to the Bank. The final report will be submitted to the Bank within 120 days following the date stipulated for the last disbursement of the loan. Each executing agency will present separate audit reports. The contracting procedures, scope, and presentation of the audits will be governed by the Financial Management Guide for IDB-financed Projects (document OP-273-6). The MMAyA will submit the audits through the UCEP.
- 4.4 **Terms of reference and technical specifications.** The sector specialist, as project team leader, will preapprove for the executing agency the review of shortlist selection criteria, terms of reference, technical specifications, and qualification requirements for candidates or consultants to evaluate proposals, regardless of the procurement review modality (ex ante or ex post).

V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

- 5.1 **Procurement execution.** Procurements will be listed in the procurement plan approved by the Bank and carried out in keeping with the Policies for the Procurement of Goods and Works financed by the Inter-American Development Bank (document GN-2349-9) and Policies for the Selection and Contracting of Consultants financed by the Inter-American Development Bank (document GN-2350-9), with respect to which no exceptions are expected; the agreement on the partial use of the NB-SABS referenced in paragraph 1.7 may also be applicable, as appropriate.
- 5.2 **Goods, works, and nonconsulting services.** The procedures for contracting works, goods, and nonconsulting services subject to international competitive bidding (ICB) will be executed using the current standard bidding documents issued by the Bank. Contracting procedures below the ICB threshold will use the standard documents agreed upon with the Bank and made available through SICOES. Simple works or off-the-shelf goods whose value is below the ICB amount may be procured through price comparison, with the authorization of the Bank, which will recommend the document to be used. Changes to any standard document will require the prior no objection of the Bank.
- 5.3 **Selection and contracting of consultants.** Procedures for selecting consultants will be executed taking into account the following:
- (i) **Selection of consulting firms.** Consulting firms will be selected using the Bank's current Standard Request for Proposals.
 - (ii) **Shortlist of consulting firms.** The shortlist may be comprised entirely of Bolivian firms³ for contracts valued below the Bank's international shortlist threshold for Bolivia.
 - (iii) **Selection of individual consultants.** Individual consultants will be selected taking into account their qualifications for the assignment, based on a comparison of the qualifications of at least three suitable candidates, and whether they can work without requiring support from outside professionals. When the announcement is made through SICOES, evaluation of one candidate will be sufficient to award the contract.
- 5.4 **Retroactive financing.** The Bank may retroactively finance eligible expenditures of up to US\$8 million (20% of the proposed financing) made by the borrower prior to the loan's approval date. These expenditures, which include works, consultants for risk studies and works designs, and administrative expenses, will be recognized provided they meet requirements substantially similar to those set out in the loan contract. These expenditures must have been made during the 18 months prior to the date the Bank approved the loan, but will not under any circumstances include expenditures made prior to 16 February 2017 (project profile approval date).
- 5.5 **Operating expenses.** Operating expenses are the recurring and maintenance expenses needed to implement the program during its useful life. These expenses cover: office rent, utilities, radio, written, or televised communication, procurement

³ This does not preclude participation of foreign companies.

notices, translations, bank fees, basic office supplies, photocopies, postage, and fuel, among other expenses agreed upon with the Bank. Operating expenses will be financed by the project as part of the annual budget approved by the Bank and are included in the program procurement plans. Procurement for recurring expenses will follow the executing agency's administrative procedures referenced in the program Operating Regulations. The Bank may forego financing these expenditures if it determines that the principles of competition, efficiency, and economy were violated.

- 5.6 **Procurement planning.** The executing agency will publish the procurement plan in the Procurement Plan Execution System and will update it at least once a year, or as needed. A procurement process may be launched provided it is included in the procurement plan previously approved by the Bank.
- 5.7 **Domestic preference.** Domestic preference in contracts is not envisaged.

Table 1. Threshold amounts (US\$)

International competitive bidding		National competitive bidding *		Price comparison (Shopping)		International shortlist	National shortlist
Works	Goods	Works	Goods	Works	Goods	Consultants	Consultants
Greater than 3,000,000	Greater than 200,000	Greater than 3,000,000	Greater than 50,000 up to 200,000	Up to 250,000	Up to 50,000	Greater than 200,000	Up to 200,000

* Simple works and off-the-shelf goods whose value is under the NCB threshold may be procured using Shopping.

5.8 Main procurements planned

Table 2. Main procurements planned

Description	Selection method	Estimated amount (US\$ thousands)
Contracting works		
Flood risk prevention in the Rocha River basin, including preparation of works maintenance protocols	ICB	12,095.8
Landslide risk prevention in the Alpacoma River basin, including preparation of works maintenance protocols	PC	575.2
Flood and landslide risk prevention, including preparation of works maintenance protocols – 1st and 2nd Group	ICB	16,072.2
Goods		
Procurement of vehicle, equipment, and furniture for the UCEP	PC	84.8
Nonconsulting services		
Implementation of the program's communication plan, years 3 and 4	NCB	90
Implementation of the program's communication plan, years 5 and 6 (1st half of year)	ICB	210
Consulting firms		
Supervision of flood risk mitigation works in the Rocha River basin, including the municipios of Cochabamba, Colcapirhua, Quillacollo, Vinto, and Sipe Sipe	QCBS	917.9

Table 2. Main procurements planned

Description	Selection method	Estimated amount (US\$ thousands)
Supervision of landslide risk mitigation works in the Alpacoma River basin	CQS	43.6
Probabilistic risk assessments to identify and design mitigation works - 1st and 2nd Group	QCBS	740
Final designs of climate risk mitigation works - 1st and 2nd Group	QCBS	1,220
Supervision of climate risk mitigation works - 1st and 2nd Group	QCBS	1,216.9
Implementation of early warning and related (NGO/University) systems in the program's intervention areas	QCBS	1,200
Economic behavior field study on economic and social determinants of risk exposure, Phase I: situation prior to the program, and Phase II: end of the program	CQS	200
Services for the program's external auditing	CQS	250
2nd survey for impact assessment	CQS	100
Impact assessment of program	CQS	150
Individual consultants		
Specialists in communication, climate risk (2), hydrological risk, climate change, and studies to systematize experiences	NICQ	470.5
Technical specialist and specialists in procurement, finance, and planning and monitoring	NICQ	660
Specialists in knowledge, environmental, and social management, and technical monitoring (3), and midterm and final program evaluation	NICQ	730

* Click here to access the procurement plan for the first 18 months.

- 5.9 **Procurement supervision.** The project will use the ex ante review method for all international processes and exceptions such as: direct contracting, direct selection, and modalities outside of the established thresholds.
- 5.10 **Ex post review.** An external auditing firm will conduct the ex post procurement review as determined by the Bank.
- 5.11 **Reviews.** The Bank may make periodic visits to update the level of procurement management capacity and of fiduciary risk associated with the operation's execution.
- 5.12 **Records and files.** Each executing agency will be responsible for establishing the necessary controls for the safekeeping and integrity of documents created, ex ante or ex post, by program execution. The Bank may at any time verify the standards used for the organization, control, and security of records.

VI. FINANCIAL MANAGEMENT

- 6.1 **Programming and budget.** The UCEP and the FPS, in their capacity as executing agencies, will program and plan project activities based on the works approved in agreement with the Bank and reflected in the annual work plan and the multiyear execution plan. To this end, each executing agency will ensure budget entries and amendments are made as needed for the project. The development, approval,

execution, monitoring, and evaluation of both executing agencies' budgets will follow the guidelines set forth in the specific regulations of the MMAyA's and FPS's budget system.

- 6.2 **Accounting and information systems.** The MMAyA's UCEP and the FPS are expected to independently manage their accounting and information systems, although both will use SIGEP. This system integrates in a single record different stages in accounting administration processes: budget record (budget execution), record of net worth (assets, liabilities, equity, and balance) and treasury record (cash transfers). The accrual accounting method will be used, and International Accounting Standards and Government Standards will be applied at the same time given that execution in SIGEP is governed by the latter. Additionally, for the MMAyA's UCEP's accounting records of loan proceeds, the SIAP-BID will have to be used as a supplementary accounting record for issuing the reports required by the Bank, including disbursement requests. The FPS will use SIGEP, which has an interface with its own system (iSAP) that can issue reports in the formats required by the Bank. For bookkeeping purposes a chart of accounts will be prepared that identifies the expenditures by item, linking the investment categories with the respective budget lines and accounting accounts.
- 6.3 **Disbursements and cash flow.** The loan will be disbursed mainly through funding advances independently both for the UCEP as well as the FPS, in keeping with the operation's financial programming. Each of the executing agencies will coordinate beforehand to periodically update the financial programming. The loan proceeds will be deposited in the CUT at the Bolivian Central Bank and subsequently transferred to operational accounts in local currency (passbooks). The Bank may make a subsequent advance solely when at least 80% of the total advance previously disbursed for the UCEP and 70% for the FPS has been accounted for. Both the MMAyA's UCEP and the FPS are responsible for managing the funds, all of which are subject to institutional internal control systems. The payment reimbursement method may be used for recognizing the expenditures made by the MMAyA and the FPS prior to eligibility. The use of the direct payment method is limited to exceptional cases and is subject to the Bank's prior consent.
- 6.4 **Permanent flexibilization for the FPS.** For the FPS, a level of 70% was set for accounting for funds advances for the following reasons: (i) the amount of each projected contract in the program portfolio is high (>US\$1,000,000). Accordingly the bills will be for amounts significantly over US\$200,000 (equivalent to Bs 1,400,000), generally presented at the end of each month, concentrating payments in 2 or 3 days. Because of this, neither the payments nor the justification of 80% of the expenditures can be done sufficiently in advance; (ii) the start of the works for which the FPS is responsible depends largely on progress on the MMAyA's preinvestment activities. Each of these activities⁴ is closely related, and any change in the timing of the activities (moving up or delay) will have an impact on financial planning. In this scenario, and recurrently over the life of the program, the balance of the 20% of the advance of funds remaining in the passbook is

⁴ Preinvestment activities include: Probabilistic risk study, cumulative loss function studies, and studies to identify the technical solution (type of works, strategic location of the technical solution, social and environmental studies, technical consultations, agreement with the municipio, agreement with the ETAs), etc.

projected to not always be sufficient to cover the bills for the FPS' works. For that reason, permanent flexibilization has been approved.

- 6.5 **Internal controls and audits.** Both the MMAyA and the FPS have an internal control system that includes instruments for prior and subsequent control that are incorporated in each agency's organizational plan, regulations, and procedure manuals. Both agencies also have an internal audit unit directly under their highest executive authority, charged with conducting independent evaluations to determine the extent of compliance and effectiveness of the management systems and internal control tools at the agency. The internal audit reports resulting from this review contain recommendations to be implemented by the administration. The program is expected to be included in this kind of review, and the reports would be used in planning the external auditor's work. The Bank will, as a strategic activity within its remit, organize coordination meetings with the internal audit unit of both executing agencies to identify project monitoring activities. The Bank will also invite the internal audit units to participate in the fiduciary workshops on financial execution of projects.
- 6.6 **External control and reporting.** Inasmuch as the proceeds are managed independently, the external audit will be separate for each executing agency. Nevertheless, the MMAyA's UCEP, as the lead sectoral agency, will hire a single auditing firm. The contract will be multiyear in order to: (i) avoid transactional costs; (ii) have continuity in the auditors' work; and (iii) ensure semiannual preliminary reviews.
- 6.7 **Financial supervision plan.** Financial supervision will be ex post for the two executing agencies and will involve: (i) a comprehensive visit (procurement and finance) to the locations where loan proceeds have been invested; (ii) visits to verify implementation of the internal control recommendations made by the external auditor; and (iii) the project's external annual audit and desk review of the audit report.
- 6.8 **Execution mechanism.** The MMAyA and the FPS will be strengthened with additional personnel in financial-accounting management and procurement so they may undertake the additional fiduciary responsibilities of this operation. The corresponding program Operating Regulations will regulate, among other things, contracting of audits, financial management of execution of program loan proceeds, overall financial programming, and information flow between the two executing agencies.

OUTCOMES											
Component 1: Climate risk reduction											
Outcome 1.1: Reduced climate risk in priority basins											
Indicator	Unit of measure	Baseline	Baseline year	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half of 2023)	End of project	Means of verification
Reduction in modeled expected annual economic losses from flooding per inhabitant in the project's areas of influence.	US\$ per capita	0	2017	0	94	374	515	609	749	749	Results from climate risk models, considering the effect of project mitigation works.
Reduction in modeled expected annual economic losses from landslides per inhabitant in the project's areas of influence.	US\$ per capita	0	2017	0	34	34	67	101	135	135	Results from climate risk models, considering the effect of project mitigation works.
Total number of households that are beneficiaries of improved management and sustainable use of natural and cultural capital.	Number	0	2017	0	657	1,791	1,112	805	1,112	5,477	Flood and landslide risk analysis, including climate change scenarios in the Rocha and Alpacoma basins.
Percentage of people in intervention areas who have enhanced their knowledge about environmental issues	%	0	2017	0	0	2	5	7	10	10	Assessment of environmental knowledge through baseline surveys and monitoring.
Outcome 1.2: Bolivia's improved performance in identifying risk											
Indicator	Unit of measure	Baseline	Baseline year	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half of 2023)	End of project	Means of verification
Increase in the RMI-RI-4 indicator.	Index	2	2013	2	2	2	2	3		3	Report on risk management index.

Component 2: Climate risk knowledge management

Outcome 2.1: Improved technical capacities for climate risk assessment and its use in development planning

Indicator	Unit of measure	Baseline	Baseline year	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half of 2023)	End of project	Means of verification
Increase in central government's and ETAs' knowledge of techniques for probabilistic assessment of climate risk	% change	0	2017							50	Tests given during training
Number of planning tools (territorial comprehensive development plans, AWP, etc.) that include risk analysis	Number	0	2017				1	1	2	4	Monitoring reports
Number of government agencies that benefitting from projects that strengthen technological and managerial tools to improve public service delivery	Number	0	2017			1	2	2	2	7	Monitoring reports

OUTPUTS												
Component 1: Climate risk reduction												
Output	Unit of measure	Associated outcomes	Cost (US\$)	Baseline	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half of 2023)	End of project	Means of verification
<u>Output 1:</u> Projects from the Rocha sample executed	#	1.1	13,757,226	0		2	3				5	Acceptance certificate for the works
<u>Output 2:</u> Projects from the simple in Alpacoma, executed	#	1.1	652,914	0		1					1	Acceptance certificate for the works
<u>Output 3:</u> Probabilistic risk evaluations and final designs of mitigation works by area of intervention prepared	#	1.2	1,960,000	0	1	2	1				4	Final evaluation report and designs approved by VRHR
<u>Milestone 1:</u> Evaluations performed	#		740,000	0	1	1					2	Final evaluation report approved
<u>Milestone 2:</u> Designs prepared	#		1,220,000	0		1	1				2	Final design report approved
<u>Output 4:</u> Other municipal projects executed	#	1.1	18,842,082	0			3	4	3	4	14	Acceptance certificate for the works
<u>Output 5:</u> Protocols for works maintenance, by municipio, prepared and shared	#	1.1	160,500	0		3	6	4	3	4	20	Protocols approved by VRHR
<u>Output 6:</u> Environmental awareness-raising activities for the population, at the area of intervention level, performed	#	1.1	352,478	0			1	1	1	1	4	Program status reports
Output	Unit of measure	Associated outcomes	Cost (US\$)	Baseline	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half of 2023)	End of project	Means of verification
<u>Output 7:</u> Hydrological early warning system designed and operating at the area of intervention level	#	1.1	1,200,000	0				1	1	1	3	Technical operating report approved

Component 2: Climate risk knowledge management												
Output	Unit of measure	Associated outcomes	Cost (US\$)	Baseline	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half of 2023)	End of project	Means of verification
Output 8: Total technical personnel from the central government and ETAs trained in climate risk analysis	#	2.1	72,000	0		20	20	20	20		80	-Lists of participants -Certificates
Output 9: Action Plan prepared for the Hydrological Risks and Climate Change Component of the National Watershed Plan	#	2.1	76,000	0				1			1	Action Plan document approved by the VRHR
Output 10: Hydrological Risk Management, Projects, and Strategic Issues Unit, strengthened	%	2.1	237,200	0	20	20	20	20	20		100	Unit Management Reports
Output 11: Total technical personnel in ETAs trained on integrating the DRM and CCA approach in the PTDis and AWP ¹	#	2.1	72,000	0		20	20	20	20		80	-Lists of participants -Certificates
Output	Unit of measure	Associated outcomes	Cost (US\$)	Baseline	Year 1* (2nd half of 2018)	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	Year 6* (1st half 2023)	End of project	Means of verification
Output 12: Characterization study performed of the native, indigenous, and multicultural population and their risk exposure	#	2.1	200,000	0		1				1	2	Final reports of the studies approved by the IDB evaluation team
Output 13: Report prepared on systematizing program experiences	#	2.1	30,000	0						1	1	Final report of the study approved by the MMAYA

¹ Subnational planning instruments, PTDI: Territorial Comprehensive Development Plans.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/17

Bolivia. Loan ____/BL-BO to the Plurinational State of Bolivia
Bolivia Resilient to Climate Risks

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Plurinational State of Bolivia, as Borrower, for the purpose of granting it a financing to cooperate in the execution of the program “Bolivia Resilient to Climate Risks.” Such financing will be chargeable to the Bank’s Ordinary Capital (OC) resources in the following manner: (i) up to the amount of US\$6,000,000, subject to concessional financial terms and conditions (“Concessional OC”); and (ii) up to the amount of US\$34,000,000, subject to financial terms and conditions applicable to loan operations financed from the Bank’s regular program of OC resources (“Regular OC”), as indicated in the Project Summary of the Loan Proposal, and subject to the Special Contractual Conditions of said Project Summary.

(Adopted on __ _____ 2017)