Climate Investment Funds

PPCR/SC.9/5
October 19, 2011

Meeting of the PPCR Sub-Committee
Washington, DC
November 2, 2011

Agenda Item 5

STRATEGIC PROGRAM FOR CLIMATE RESILIENCE FOR BOLIVIA

Proposed Decision by PPCR Sub-Committee

The PPCR Sub-Committee, having reviewed the *Strategic Program for Climate Resilience for Bolivia* (document PPCR/SC.9/5),

a) endorses the SPCR as a basis for the further development of the projects foreseen in the strategic plan and takes note of the requested funding of USD 50 million in grant funding and USD 60 million in other concessional resources.

b) reconfirms its decisions on the allocation of resources, adopted at its meetings in June 2010 and 2011, that a range of funding for the country should be used as a planning tool in the further development of project and program proposals to be submitted to the PPCR Sub-Committee for approval of PPCR funding, recognizing that the minimum amount of the range is more likely and that the upper limit of the range will depend on availability of funding. The range of funding agreed for a single country pilot program is USD 40-50 million in grant resources, and USD 36 million in other concessional resources. The Sub-Committee reconfirms its call for contributors and other countries, MDBs and other development partners to seek to mobilize resources to allow for the full funding of the SPCR.

c) recognizes that the quality of the project and program proposals will be a significant factor in the funding to be approved by the Sub-Committee when such proposals are submitted for approval of PPCR funding.

d) approves a total of USD2.5million in PPCR funding as preparation grants for the following projects to be developed under the SPCR,

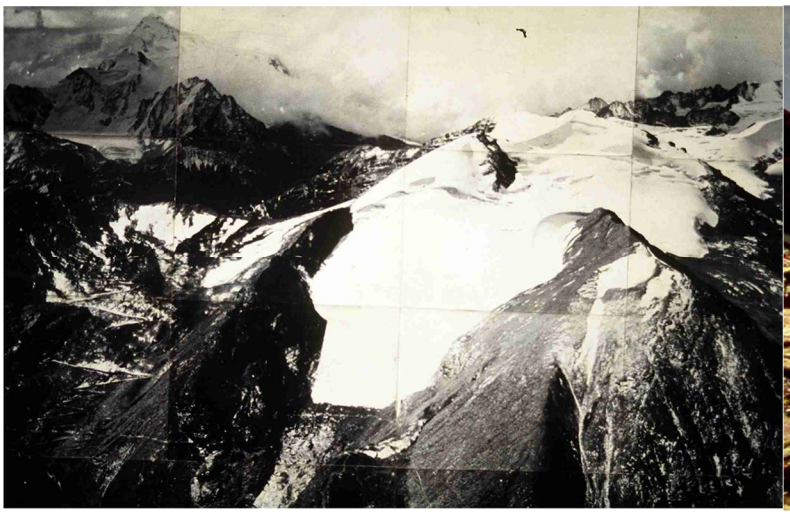
   i. USD 2,000,000 for the project, *Multipurpose water resources project for El Alto and La Paz* (IDB).
   ii. USD 500,000 for the project, *Incorporating Climate Change Resilience in Development Processes and Strengthening the Climate Change Resilience of the Rio Grande Basin* (World Bank).

e) takes note of the estimated budget for project preparation and supervision services for the projects referenced above and approves a first tranche of funding for the preparation and supervision services as follows:

   i. USD250,000 for the project, *Multipurpose water resources project for El Alto and La Paz* (IDB).
   ii. USD475,000 for the project, *Incorporating Climate Change Resilience in Development Processes and Strengthening the Climate Change Resilience of the Rio Grande Basin* (World Bank).

f) requests the Government of Bolivia and the MDBs to take into account written comments submitted by Sub-Committee members by November 15, 2011, in the further development of the projects foreseen in the SPCR.

BOLIVIA: STRATEGIC PROGRAMME FOR CLIMATE RESILIENCE

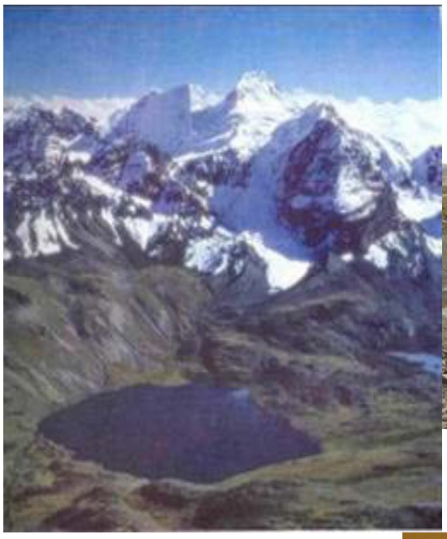


PILOT PROGRAMME FOR CLIMATE RESILIENCE (PPCR)

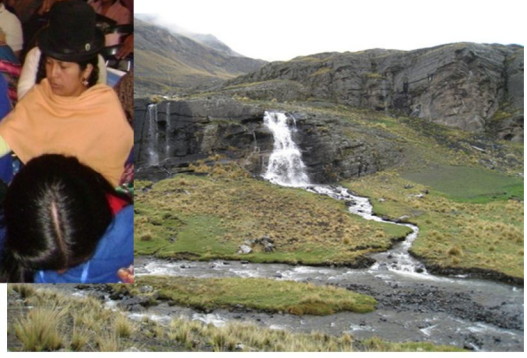
CLIMATE INVESTMENT FUNDS

La Paz - Bolivia

October 2011








"To address climate change we must recognize Mother Earth as the source of life and forge a new system based on the following principles:

- **Harmony and balance between all and everything.**
- **Complementarity, solidarity and equity.**
- **Collective welfare and satisfaction of everyone's basic needs in harmony with Mother Earth.**
- **Respect for the Rights of Mother Earth and Human Rights.**
- **Recognition of the human being for what he/she is and not for what he/she has.**
- **Elimination of all forms of colonialism, imperialism and interventionism.**
- **Peace among peoples and Mother Earth".**

People's World Conference on Climate Change and the Rights of Mother Earth
Cochabamba, Bolivia, April 19 to 22, 2010

Glossary of Acronyms

AAPS	(from Spanish) Water and Sanitation Social Control Authority
ASPNC	(from Spanish) Sectoral Support to the National River basins Plan
CAF	(from Spanish) Andean Development Corporation
CEPAL	(from Spanish) Economic Commission for Latin America and the Caribbean
CIF	Climate Investment Funds
CIPCA	(from Spanish) Center for Research and Advancement of Farmers
CONARADE	(from Spanish) National Council for Disaster Risk Reduction and Attention to Disasters and/or Emergencies
COP	Conference of the Parties (to UNFCCC)
COSUDE	Swiss Agency for Development and Cooperation
CPE	(from Spanish) Political Constitution of the State
DANIDA	Danish International Development Agency
EMDAT	Emergency Database
ENI	(from Spanish) National Implementation Strategy (of the Convention on Climate Change)
ENSO	El Niño-Southern Oscillation
EPSAS	(from Spanish) Social Public Company for Water and Sanitation
FAM	(from Spanish) Federation of Municipalities of Bolivia
FAN-BOLIVIA	(from Spanish) Friends of Nature Foundation (Bolivia)
GEF	Global Environment Fund
GIZ	German International Cooperation
ICA	International Cooperation Agencies
IDB	Inter-American Development Bank
INE	(from Spanish) National Statistics Institute
IPCC	Intergovernmental Panel on Climate Change
IRD	Research and Development Institute (France)
IRBM	Integrated River Basin Management
IWRM	Integrated Water Resources Management
KfW	German Bank for Reconstruction
MDB	Multilateral Development Banks
MMAyA	(from Spanish) Ministry of Environment and Water
MNACC	(from Spanish) National Mechanism for Adaptation to Climate Change
MOP	(from Spanish) Operations Manual
MPD	(from Spanish) Ministry of Development Planning
M&E	Monitoring and Evaluation
OECOM	(from Spanish) Economic Organization of Communities
OGC	(from Spanish) Watersheds Management Agency
PDC	(from Spanish) Basins Management Plan
PET	Potential Evapotranspiration
PNC	(from Spanish) National Watersheds Plan
PND	(from Spanish) National Development Plan
PNCC	(from Spanish) National Climate Change Program
PNDR	(from Spanish) National Risk Plan
PPCACC	(from Spanish) Pilot Program for Adaptive Capacity to Climate Change
PPCR	Pilot Program for Climate Resilience

PROIMPA	(from Spanish) Foundation for the Promotion and Research of Andean Products
PWCCC	People's World Conference on Climate Change
SEARPI	(from Spanish) Water Channeling and Regularization Service of the Piraí River
SENAMHI	(from Spanish) National Service of Meteorology and Hydrology
SISRADE	(from Spanish) National System for Disaster Risk Reduction and Attention to Disasters and/or Emergencies
SPCR	Strategic Program for Climate Resilience
SRES	Special Reports on Emissions Scenarios
SWAT	Soil and Water Assessment Tool
TTL	Task Team Leader
UNCP	(from Spanish) National Program Coordination Unit
UDAPE	(from Spanish) Economic Policies Analysis Unit
UN	United Nations
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UO	(from Spanish) Operational Units
VASB	(from Spanish) Vice Ministry of Water and Basic Sanitation
VIPFE	(from Spanish) Vice Ministry of Public Investment and External Financing
VMA	(from Spanish, abbreviated) Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management
VPC	(from Spanish) Vice Ministry of Planning and Coordination
VRHR	(from Spanish) Vice Ministry of Water Resources and Irrigation
WB	World Bank
WEAP	Water Evaluation and Assessment Program
WFP	World Food Program
WWF	World Wildlife Fund

Table of Contents

PILOT PROGRAM FOR CLIMATE RESILIENCE

Summary of the Strategic Program for Climate Resilience

1. Country / Region:	Plurinational State of Bolivia	
2. PPCR Request for Funds (US$ million):	*Loan: 60*	*Grant: 50*
3. PPCR National Focal Point:	Minister Viviana Caro, Ministry of Development Planning (MPD, by its acronym in Spanish) Minister Julieta Monje, Ministry of Environment and Water (MMAyA, by its acronym in Spanish)	
4. National Implementing Agency (Coordination of Investment Strategy)	Vice Minister Carlos Ortuño, Viceministy of Water Resources and Irrigation (VRHyR by its acronym in Spanish)	
5. MDB involved	World Bank (WB), Inter-American Development Bank (IDB)	
6. MDB PPCR Focal Point and Program/Project Task Team Leader for the:	Headquarters-PPCR Focal Point: IDB: Gloria Visconti gloriav@iadb.org WB: Kanta Kumari Kkumari@worldbank.org	TTL: IDB HQ: Alfred Grünwaldt alfredg@idb.org IDB local focal point: Edgar Orellana edgaro@idb.org WB HQ: Marie-Laure Lajaunie mlajaunie@worldbank.org WB local focal point: Ma. Elena Soria msoria@worldbank.org

7. SPCR Description:

- *Key challenges related to vulnerability to climate change / variability:*

Within the framework of the observed and projected effects of climate change for Bolivia, the issue of water resources is a central challenge, as indicated by the National Development Plan and National Adaptation Mechanism. The negative effects of climate change include the increased frequency and intensity of extreme weather events (droughts and floods), which in turn have an impact on agricultural production, food security, infrastructure and human health among others. Climate change also accelerates the increase of water scarcity in some of river basins, which affects various water availability for drinking (with indirect impacts on human health), for agricultural production (with impacts on food security, farmers' incomes, and rural and urban poverty), for the production of hydropower, for mining and industrial production, and for ecosystems (Bolivia, being one of the world's richest countries in biodiversity).

- *Areas of intervention – sectors and themes*
  - COMPONENT 1:Strengthening the national capacity for managing climate change
  - COMPONENT 2:Climate resilience program for the water and sanitation systems of the metropolitan areas of La Paz and El Alto
  - COMPONENT 3:Strengthening the resilience to climate change in the Rio Grande basin
- *Expected results of the implementation of SPCR*

- Increased experience and lessons learned on climate resilience by addressing some of Bolivia's priorities related with water provision, agriculture, irrigation, and flood prevention, for which a territorial river basin approach will be used.
- Better integration of resilience in sector development strategies, plans, policies, etc., from national to local levels beginning with water and sanitation (W&S) services, food security and priority production systems and drought and flood management.
- Increased experience and institutional capacity to deal with climate related challenges, including better use of climate scenarios, better integration of climate change considerations into the National Public Investment System, and enhanced coordination among different public institutions.
- Increased resilience in W&S services as well as priority production systems, and the reduction of losses caused by floods and droughts.
- Better integration of adaptive management and inter-sectoral learning in the formulation and implementation of related policies and programs.

8. Expected Key results from the implementation of the Investment Strategy (consistent with PPCR Results Framework):

Result	Success Indicator(s)
Component 1: Strengthening the national capacity for managing climate change Expected key results: (i) Integrated river basin investment projects in Bolivia use concepts and/or methodologies developed under the SPCR; (ii) Government institutions at the national and sub-national level have integrated climate resilience issues in their work plans and procedures.	• The availability of climate change scenarios of high resolution in the areas of intervention, that are easily accessible to decision makers, experts and the general public • Reliable and easily accessible hydro-meteorological information, available to the public • Volume of use of the SENAMHI and PNCC websites and related social media • Number of institutions where relevant staff, disaggregated by sex, has been trained in the use of high resolution scenarios and other climate information to help in decision making processes • The availability of methodological guidelines on river basin planning and of modified project preparation guidelines • Number of publications on methodologies applied and lessons learned under the SPCR • A mechanism for monitoring and evaluation (M&E) has been established in national and sub-national government institutions to measure achievements towards reducing vulnerability to climate change • Number of beneficiaries of integrated river basin management and water and sanitation programs and projects that effectively incorporate climate change considerations in design
Component 2: Climate resilience program for the water and sanitation systems of the metropolitan areas of La Paz and El Alto	• Population served with high quality water and sanitation services (disaggregated by vulnerable groups)

Expected key results:(i) The water systems in La Paz and El Alto have an increased resilience in response to the observed trends and possible climate change scenarios(retreat of glaciers + seasonal variation in the hydrological cycle); (ii) There is a significant number of approved and successful adaptation measures piloted in the River basin Management Plan that will enable the scaling of specific investments; (iii) Improved management of climate and water information allows for mainstreaming climate considerations into the planning process, consultations and decision making; (iv) Integrated river basin management plans have been implemented; (v) Lessons learned about incorporating climate change in planning, design, investment, operation and coordination work with stakeholders, have been systematized and disseminated.	• Percentage of water availability in relation to existing demand over the next 10 years since the start of the Program • Number of million cubic meters (Mcm) of additional regulation capacity • Percentage reduction in non-revenue water (unaccounted for water) expressed as the ratio of potable water produced minus water effectively billed as percentage of total potable water. • Number of million cubic meters (Mcm) of additional water available for multiple uses • Number of projects or programs in the metropolitan area which include actions that lead to a reduction of climate vulnerability and the strengthening of climate-dependent systems in 2020, using as reference the base from 2007 to 2011 • Number of persons, disaggregated by vulnerable groups, that suffer the impacts of actually occurring extreme climate events on their water and sanitation services quality level, as compared to business as usual scenario. • Increase (%) of the human development index within the areas of intervention
Component 3: Strengthening the resilience to climate change in the Rio Grande basin Expected key results:(i) The resilience to climate change of production systems, ecosystems and prioritized settlements has increased in two pilot sub-basins of the Rio Grande (Mizque and Piraí); (ii) Concrete experiences in planning, designing and implementing of integrated investments that improve climate resilience have generated results and lessons learned for setting and adjusting national standards for public planning and investment.	• Area and number of beneficiaries, disaggregated by sex, with a farming system that is more resilient to climate change • Area and number of persons, disaggregated by sex, protected from flooding • Number of integrated and participatory river basin management plans, that effectively incorporate climate resilience, formulated and implemented in two pilot sub-basins of the Rio Grande and coordinated with development plans of local governments • Information, monitoring and evaluation systems that generate data/knowledge on the effects of climate change and of the impacts of sub-basins management plans, which is used by decision makers to manage them • Number of water user organizations and number of associates, trained to integrate basic water use efficiency and sustainability aspects in the water systems they handle, as well as climate variability and change factors in their actions • The guidelines for the preparation of pre-investment studies (*Estudio de Identificación*–EI and *Estudio Integral Técnico, Económico, Social y Ambiental*–TESA) of irrigation and river basin management sub-projects,

	as part of the National System for Public Investment, have been updated to incorporate the climate change dimension • Key river basin institutions (SEARPI, municipal associations and municipalities) using river basin plans and revised guidelines for pre-investment studies in irrigation and river basin management projects to identify and prepare new investments. • Increase (%) of mean agricultural family income within areas of intervention. • Reduction (%) of mean annual economic losses caused by flood events within areas of intervention.

9. Program and Project Concepts under the LPS:

Concept Title of the Project/ Program	MDB	Required Amount for PPCR ($)	Grant or Loan	Expected Co-financing ($)	Grant Application for Preparation ($)	Total Request for PPCR ($)[1]
Component 1 Strengthening the national capacity for managing climate change	WB	5.0	Grant	0.61	0.5	5.5
Component 2 Climate resilience program for the water and sanitation systems of the metropolitan areas of La Paz and El Alto	IDB	42.5	Grant	161.5	2.0	44.5
Component 3 Strengthening the resilience to climate change in the Rio Grande basin	WB	60	Loan	14.1	Combined with Component 1	60
	TOTAL	**107.5**		**176.21**	**2.5**	**110**

10. Estimated Timeline(tentative) – Approval key dates[2]
The following dates are only initial estimates:
Endorsementof SPCR: November 2011
Preparation of investment projects: November 2011 to November 2012 (1 year)
Implementation of investment projects: November 2012 to November 2018 (6 years)

11. Key groups interested in the design of the SPCR[3]:
Ministry of Development Planning (MPD, by its acronym in Spanish)
Vice Ministry of Public Investment and External Financing
Vice Ministry of Planning and Coordination

[1]Includes grant for preparation and project/program amount.
[2]Expected signature of the agreement for the loan/grant between the government and the respective MDB.
[3]Other local, national and international partners are expected to be involved in the design and implementation of the strategy.

Ministry of Environment and Water (MMAyA, by its acronym in Spanish) Viceministy of Water Resources and Irrigation (VRHyR by its acronym in Spanish) Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management National Climate Change Program (by its acronym in Spanish, PNCC) National Service of Meteorology and Hydrology (by its acronym in Spanish, SENAMHI) Social Public Company for Water and Sanitation (by its acronym in Spanish, EPSAS) Water Channeling and Regularization Service of the Piraí River (by its acronym in Spanish, SEARPI) Commonwealth of the Southern Cone in the sub-basin of the Mizque River World Bank Inter-American Development Bank
12. Other partners involved in the SPCR: Dutch Cooperation, AECID, European Commission, GIZ, KfW, ASDI, JICA, DANIDA, UNDP, FAO, COSUDE, WFP.

PART ONE

Introduction

This document is submitted to the PPCR Sub-committee by the Plurinational State of Bolivia, for the endorsement of the proposed Strategic Program for Climate Resilience (SPCR) to access concessional funds up to US$110 million (One hundred and ten million dollars) for its implementation. The SPCR aims to strengthen Bolivia's capacity to define and implement an Integrated River Basin Management (RBM) approach as a structural element for a climate resilience strategy at the central level and in three prioritized sub-basins. The Program is consistent with the priorities of the National Development Plan and builds on the guidelines outlined by the National Climate Change Adaptation Mechanism for identifying the most vulnerable sectors and systems in the country.

The document consists of two parts. The first describes the current situation of the country and its development context, the greatest climate risks for the development of the country,and recent advances in policies, strategies and programs on adaptation to climate change. The second part describes thefoundations that support the Program, its structure and the detailed implementation of its three investment components, including budget and financing, as well as arrangements for its implementation. Finally, as reference, it also includes an extensive bibliography and several annexes, including the report of an external reviewer of the document, whose recommendations have been incorporated to the document.

Specifically, the Strategic Program for Climate Resilience has three components divided as follows:

- A technical assistance component at the national level that has the following objectives: (i) to strengthen the institutional and technical capacity of institutions responsible for the collection and analysis of hydro-meteorological data to improve access to reliable and timely information for policy-makers, professionals in the field of water and the general public; (ii) to use the pilot experiences developed under Components 2 and 3 of the SPCR in the integration of climate resilience in the participatory, integrated planning processes at the river basin level, for its potential application in other basins of the country; as well aslaying the foundations for the integration of climate resilience in the planning and investment processes at sectoral and territorial levels (iii) ensure the overarching coordination and integration at the program level.

- Two investment components for basins located in different areas of the country that represent 1% and 10% of the land surface of Bolivia while hosting 12% and 30% respectively of the total population, addressing diverse problems related to climate change: (i) a program aimed at increasing the resilience of the water supply system in the metropolitan area of La Paz and El Alto (which is being impacted by glacier withdrawal and would potentially affect 800 000 people) as well as other systems that use this resource, and (ii) a program for a mid-elevation and a low-elevation sub-basin of the Rio Grande, aimed at increasing the resilience of food security and agricultural production, other relevant and prioritized production systems, rural livelihoods of poor populations, and natural ecosystem services in 50 000 hectareas (mid elevation sub basin) and 100 000 hectareas (low elevations sub basin), respectively.

In August 2010, the Plurinational State of Bolivia presented a proposal for the execution of Phase I of itsPPCR, which is currently under implementation. Within this first phase, several activities at the national level are being carried out to facilitate the dialogue and coordination between different stakeholders; others are aimed at increasing the existing capacity to assess the vulnerability of different human and natural systems to climate change. Specifically, the following components have been defined in Phase 1: (i) strengthening the information system and databases for decision making;(ii) integration of climate resilience in planning, investment and management; and(iii) preparing astrategy for the implementation of sectoral and territorial climate resilience. Phase II was conceived in coordination and logical sequence with the activities initiated during the first phase to ensure coherence and mutual consistency at the national and sub-national levels.

The geographical location of the Plurinational State of Bolivia in theAndean region, combined with high levels of poverty, make it an extremely vulnerable country to climate change. Particularly, the availability of water resources for various areas of the country is being affected by accelerated glacier melting, changes in the spatial and temporal distribution of precipitation and increased evapotranspiration. This has been corroborated through hydro-climatic records, the local perception and the results of climate models. Although some initial climate projections have been providing information that suggests changes in the Bolivian climate, this information is still limited and requires a greater level of detail, analysis and dissemination to be effectively included in decision-making and planning processes. In particular, some specialized studies (such as glaciological studies) have shown that the temperature in the tropical Andes Mountains has been rising approximately 0.10°C per decade since 1939, with the warming level over the past two decades increasing to 0.33°C per decade (see Section 2). These increases in temperature will bring disruptive changes to the hydrologicalcycle, affecting seasonality and bringing immediate and long-term consequences for the productive potentialof the national economy.

1. The situation of the country and the development context

Bolivia is located in central South America, between the meridians 57º 26' and 69º 38' West of the Greenwich meridian and the parallels 9º 38 'and 22º 53' South of the Equator, covering an area of 1,098,581 km^2. 25% of the surface area corresponds to the *Altiplano* (Highlands) and the Andes Mountains, 15% to the Inter-Andean Valleys and 60% to the Lowlands of *Los Llanos* and *El Chaco*. It is bordered on the north and east by the Federative Republic of Brazil, on the south by the Republic of Argentina, on the west by the Republic of Peru, on the southeast by the Republic of Paraguay and on the southwest by the Republic of Chile.

Within the country there are four macro regions: the *Altiplano* in the west of the country; the Inter-Andean Valleys in the center of the country; *El Chaco* in the southwest; and *LosLlanos* in the northeast and east. The four areas have very different characteristics that will be described inthe next Section.

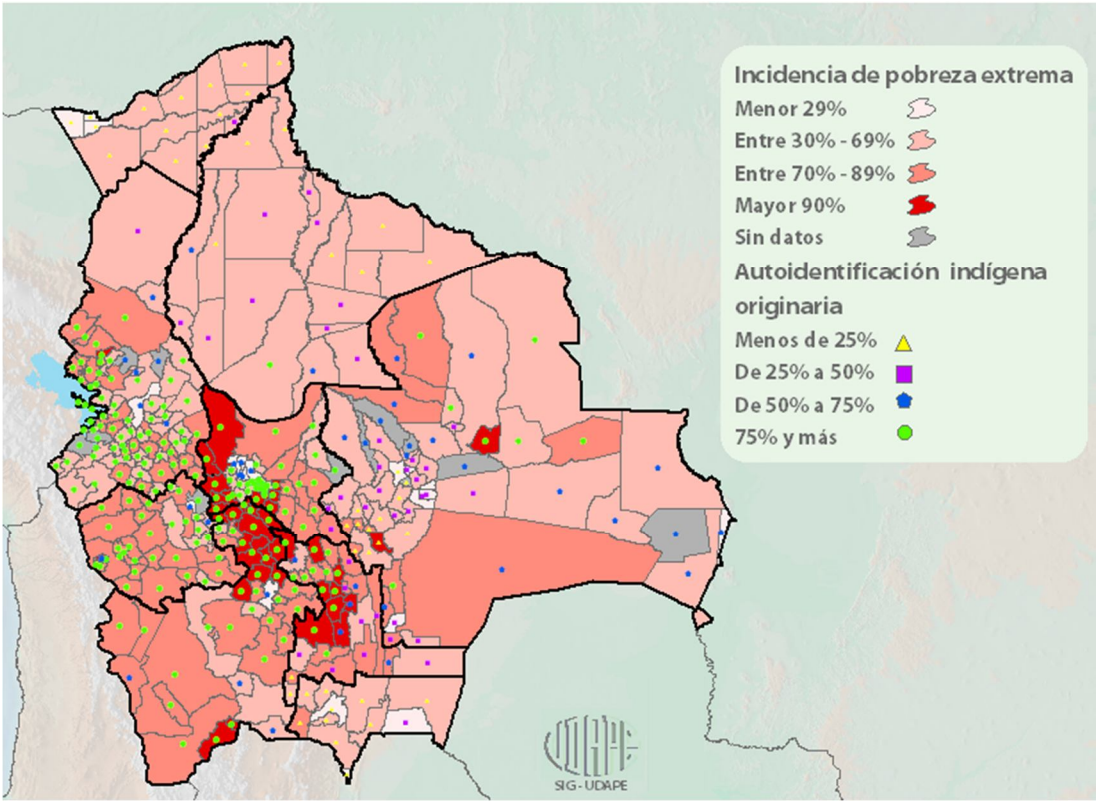
Population. It is estimated that the population in Bolivia is about 10 million people. Of these, about 64% live in urban areas and 36% in rural areas. The average population density is of 10 inhabitants per square kilometer, the lowest in the Americas. Although the lowlands of *ElChaco*and *LosLlanos* represent 60% of the territory, these regions have a sparse population. Most of the population is concentrated in the Valleys and the *Altiplano*. Onthe other hand, it is expected that by 2050 the urban population will increase by more than 75% (according to projectionsby the National Institute of Statistics, INE by its Spanish acronym). In past decades there have been two internal migration patterns. Since 1950, due to a series of political and economic factors,including the economic crisis of the 80s, in addition to the *El Niño* events of 1982/1983 that caused devastating impacts, there has been a migration from the arid regions of the *Altiplano* and the Valleys, to the Lowlands(including the Amazonia) (CEPAL 2007). In recent decades, there has also been an increasein the migration from rural to urban areas. It is projected that the population in 2050 will concentrate in four major metropolitan areas with more than one million inhabitantseach.

The indigenous population represents the majority of Bolivia's population, reaching 62% of the total. The State Constitution recognizes 36 indigenous nations: *aymara, araona, baure, bésiro, canichana, cavineño, cayubaba, chácobo, tsimane, esse ejja, guaraní, guara´sug'we, guarayo, itonama, leco, kallawaya, machineri, maropa, mojeño-trinitario, mojeño-ignaciano, more, mosetén, movima, pacawara, puqina, quechua, sirionó, tacana, tapiete, toromona, uru-chipaya, weenhayek, yaminawa, yuky, yuracaré*and*zamuco*.

Economy. Bolivia is a lowermiddle-incomecountrywith a per capita income for 2010 of US$ 1,790. While oil and mining play an important role in the economy(38.04% and 12.21% of GDP, respectively), more than 30% of the economically active population works in the agricultural sector, which implies a high dependency of the population on the climate, especially considering that only 10% of the cultivated area is irrigated. An important part of agricultural labor is done by women. INE estimates that 38% of women depend on the agriculturalsector, compared to 33% of men. This emphasizes the importance of a gender approach in climate change adaptation in rural areas.

Poverty reduction. The level of poverty in Bolivia is high, particularly in the rural and peri-urban areas in the *Altiplano* and the Valleys. The data show that for every 100 people living in Bolivia,51 are moderately poor, and that84% of the rural poor is considered moderately poor. In the Valleys and the *Altiplano* regions, poverty levels are the highest in the country and the availability of water is much lower than the national average (EACC World Bank 2010). Figure 1 shows poverty incidence among indigenous populations.

Figure 1: Incidence of extreme poverty among indigenous populations



Source: UDAPE 2010

Although since the year 2007 there has been significant progress in reducing extreme poverty in Bolivia, in absolute terms there are still 2.7 million people living in extreme poverty, of which 1.0 million resides in urban areas and 1.7 million are in rural areas. Additionally, progress in poverty indicators hide elevated levels of inequality, which have remained high (the Gini coefficient was0.506 in 2009), placing Bolivia as one of the most unequal countries in Latin America. The inequality is particularly evident at the regional (urban/rural) and ethnic (indigenous and non-indigenous) levels. Currently, 68.6% of the indigenous population lives in poverty and 34.2% in extreme poverty. The situation is worse in rural areas where 78.9% of the indigenous population lives in moderate poverty and 68.2% in extreme poverty.

Constitutional reforms towards social inclusion. In recent years, Bolivia has approved a constitutional reform that aims to empower excluded groups, to promote greater decentralization, a wider social participation and build an economy where the State becomes

the engine of development. The reform aims to establish regional and indigenous autonomies, giving these autonomies the right to manage their land and develop their agriculture sector. These changes are intended to promote greater political and social inclusion of indigenous groups and farmers, through a more decentralized government structure that meets the needs of aculturally diversepopulation (World Bank 2010).

Development priorities. The National Development Plan (PND, by its acronym in Spanish),which defines the social and economic proposal of the Government of Bolivia, is organized into four pillars: *Bolivia Digna, Bolivia Democrática, Bolivia Productiva* and *Bolivia Soberana*(Dignified Bolivia, Democratic Bolivia, Productive Bolivia and Sovereign Bolivia). The PND proposes a new comprehensive and diversified development pattern in the context of an intercultural framework. Its ultimate objective is the eradication of poverty.

Bolivia puts special emphasis on the respect and protection of natural resources and has advocated in the UN for the recognition of the "World Day of Mother Earth"[4]. The notion of the Rights of the Mother Earth has been a guideline for national policies relating to the management and conservation of natural resources, emphasizing the need to achieve higher levels of harmony with nature and leading to the promulgation of a Law on the Rights of Mother Earth.

In the context of climate negotiations, Bolivia advocates for a legally binding agreement that ensures a drastic reduction in the level of Greenhouse Gases to avoid major climate change; the level has to consider the best scientific evidence and the precautionary principle. In Copenhagen, Bolivia advocated for a 1°C maximum warming target. Bolivia also advocates for the recognition of the “climate debt” that industrialized countries have with developing countries, resulting from the excessive use of the atmospheric budget since the industrial revolution. In terms of financing mechanisms, more resources should be channeled to climate rescilience issues as most developing countries suffer the effects of climate change without contributing significantantly to global warming. In this regard, the Climate Investment Funds, particularly the Pilot Program for Climate Rescilience, provides a window of opportunity to showcase effective and transformational policies and investments developed by countries that are suffering the adverse effects of climate change in order for lessons to be learned and scaled up.

[4]Speech by the President of Bolivia, Evo Morales, in occasion of the Declaration of the International Day of Mother Earth in the UN General Assembly, New York, April 22, 2009.

BOX 1
People's World Conference on Climate Change and the Rights of Mother Earth (Cochabamba, Bolivia, April 19 to 22, 2010) states:

To address climate change we must recognize Mother Earth as the source of life and forge a new system based on the following principles:

• Harmony and balance between all and everything.

• Complementarity, solidarity and equity.

• Collective welfare and satisfaction of everyone's basic needs in harmony with Mother Earth.

• Respect for the Rights of Mother Earth and Human Rights.

• Recognition of the human being for what he/she is and not for what he/she has.

• Elimination of all forms of colonialism, imperialism and interventionism.

• Peace among peoples and Mother Earth.

In an interdependent system of which humans are just one of the components, it is not possible to recognize rights only for the human side without causing an imbalance in the system. To guarantee human rights and restore the harmony with nature it is necessary to recognize and effectively enforce the rights of Mother Earth

.

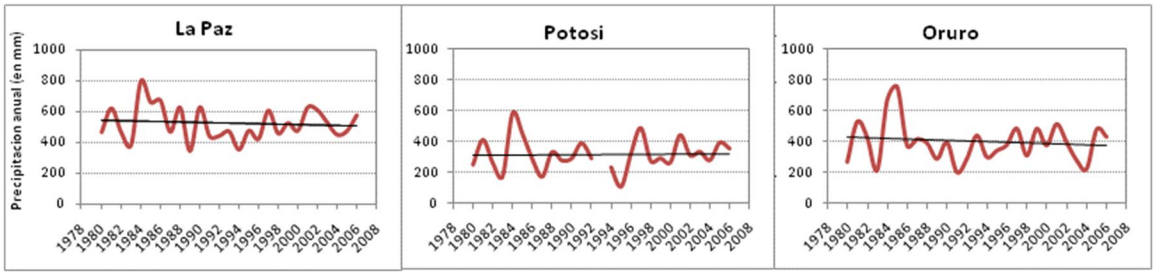
2. Climate risks to the country's development

2.1 Geographical and climatological features

Bolivia has a varied climate that includes all the sub-climates of the tropics. The climate of the country depends mainly on its latitude, its topography, location within the tropics, the presence of the Amazon, and the circulation of Alisian winds. The climate is characterized by two distinctive seasons:a rainy one in the summer, and a dry one in the winter (Montes de Oca 1995). The periods of highest rainfall are the months from December to February, while the dry season is from May to August. In general, rainfall tends to decrease from north to south. Because of its altitudinal gradient, ranging from 90 to 6,542 meters above sea level (masl), its geology and variety of climates, Bolivia is one of the world's eight richest countries in biodiversity (Ibisch et al. 2003).

The *Altiplano* and the Highlandsare the lands above 3,500 masl, with an area of approximately 28% of the Bolivian territory. The weather is cold and dry, with rainfall generally low. Because of the mountains, there are significant climatic variations such as marked differences in daily temperature and rainfall amount. For example, the southern part around the salt flats of Coipasa and Uyuni present rain precipitation between 250 and 400 mm per year. The period of highest rainfall is between the months of December and February, while the dry season is from May to August. Average annual temperatures vary between 2 and 7º C. The area around Oruro is the driest part of the country with average rainfall between 50 and 250 mm and temperatures below 5º C. Towards the department of Potosí, the average annual rainfall is between 400 and 1,100 mm and temperatures range between 7 and 10° C. The area around the city of La Paz has a rain precipitation between 500 and 1,400 mm and average temperaturesvary between 7 and 9º C. Temperatures at night can drop to around 0° C. The cumulative annual rainfall for the period 1980-2006 is presented in Figure 2. During this period we can see a slight decrease in annual rainfall in La Paz and Oruro, but little change in the city of Potosí.

Figure 2: Cumulative annual rainfall in the *Altiplano*

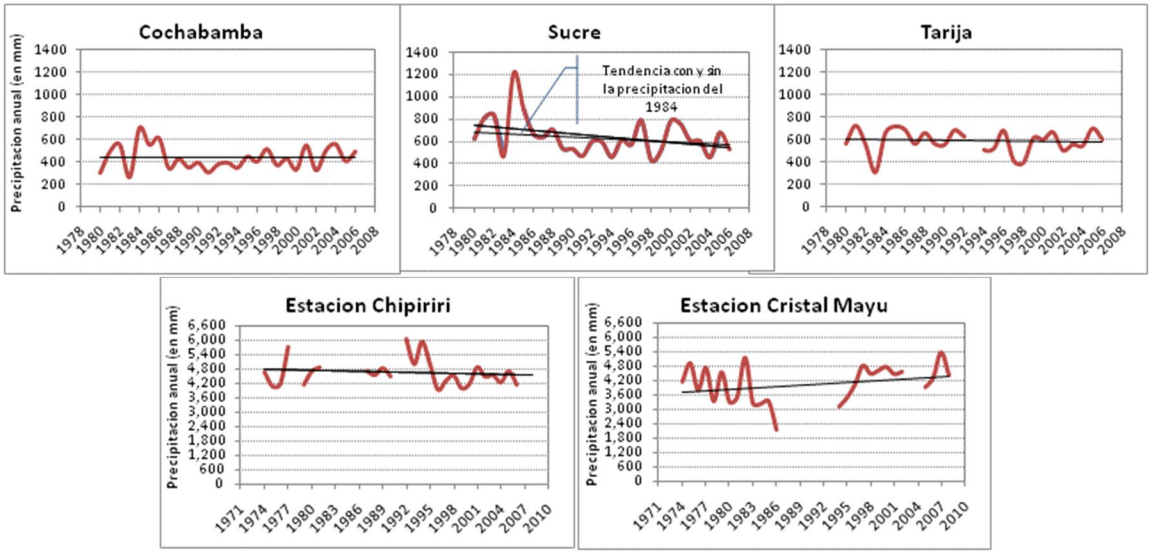


Source: Prepared with information from the document "Water Sector Program" (draft)

The Valleys are located between the Eastern Andes Range and the Amazon basin, with a height between 1,000 to 4,200 masl. The climate is temperate, with two major sub-regions: the dry valleys and the warm areas of the *Yungas*. In the dry valleys, the average rainfall varies between 500 and 700 mm, while the average temperature varies between 12 and 16º C, with maximum temperatures over 30º C and minimums below 0º C. Cochabamba, Sucre and Tarija are the main cities of this sub-region. According to available statistics, as shown in Figure 3, a slight decrease in precipitation is observed in Sucre, with less changes in the other cities. In the *Yungas*, the

average rainfall is about 1,500 mm and can reach well over 6,000 mm. The country's highest rain precipitation is in this sub-region. Figure 3 shows the rainfall in the Chipiriri Mayu and Crystal stations, both located in this sub-region. The average temperature varies between 7 and 24° C, and the limit for frost conditions is around 2,300 masl.

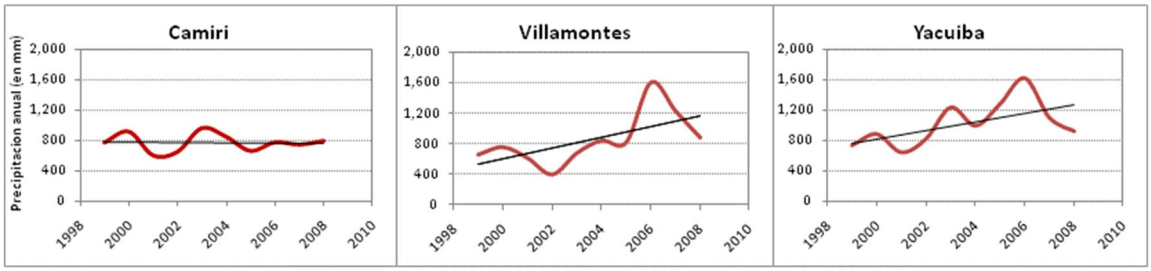
Figure 3: Cumulative annual rainfall in the dry Valleys and the *Yungas*



Source: Based on information from the document "Water Sector Program" (draft)

El Chaco islocated in the east and southeast of the country, with a height of less than 1,000 masl. This region includes the southwest corner of the Santa Cruz department, and thedepartments of Chuquisaca and Tarija. The region has variations in precipitation between 400 and 900 mmaround Chuquisaca and Tarija, increasing gradually towards the southeast corner where the average annual rainfall varies between 700 and 1,000 mm. In the vast majority of this region, the temperature variation is between 25 and 26º C, while the southeast region shows variations in temperature between 18 and 22º C. This area is influenced by cold winds from the south (called "surazos"), which cause the temperature to drop to 15º C in just a few hours. This region has a high diversity of landscapes, including plains, dry and flooded savannas, mountains, small mountains and forests, among others. The rainfall trend in three *El Chaco* locations inthe last decade is presented in Figure 4.

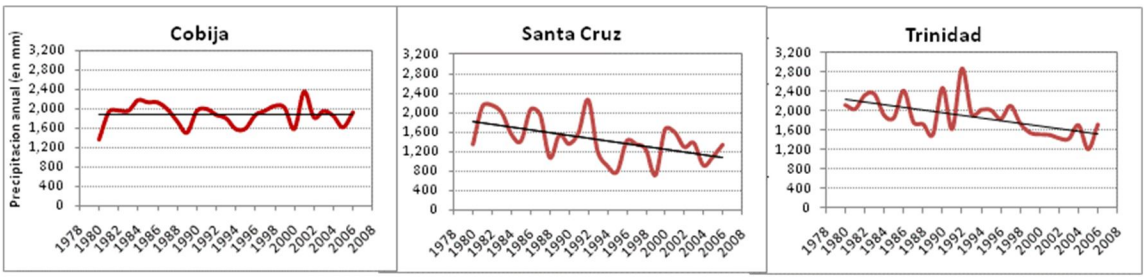
Figure 4: Cumulative annual rainfall in *El Chaco*



Source: Based on information from the document "Water Sector Program" (draft)

Los Llanos comprise almost the entireAmazon rainforest of Bolivia. This macro-regionis located in the northeast of the country with a height of less than 400 masl. The climate is warm and humid, with an annual average temperature that varies between 22 and 25º C. In the north of the department of Beni, annual rainfall averages between 1,500 and 1,700 mm. In the department of Pando rainfall varies between 1,700 and 2,000 mm, while in areas located in the department of Santa Cruz, rainfall varies between 700 and 2,000 mm. As shown in Figure 5, the annual rainfall in the cities of Santa Cruz and Trinidad recorded a decline since 1980. In Cobija, no significant changes in precipitation are observed.

Figure 5: Cumulative annual rainfall in *Los Llanos*



Source: Based on information from the document "Water Sector Program" (draft).

Although the lowlands of *LosLlanos* and *ElChaco*correspond to two thirds of the country, these regions have a sparse population. Most of the population is concentrated in the Valleys and the *Altiplano*, where water availability is significantly lower than the national average(World Bank 2010).

2.2 Observed and modeled climate changes

Although the manifestations and effects of climate change in Bolivia have been barely studied, hydro-climatic records, the local perception and climate projections provide evidence that the climate in Bolivia is changing.

The results of climate change models still have highlevels of uncertainty, mainly due to the high variability of Bolivia's topography and weaknesses in the quantity and quality of available information. Currently, the ability to predict what the specific changes in certain regions will be is very limited; however, these models indicate possible trends in future climate evolution.

Temperature. The average annual temperature has increased throughout the country. Based on glaciological studies, it has been shown that the temperature in the Tropical Andean Range has risen by 0.10° and 0.11° C per decade since 1939 and the pace of warming is increasing in the last 25 years between 0.32° and 0.34° C per decade (Vuille et al. 2000).

The average surface temperature of the Amazon region has risen by 0.08 °C per decade for the period between 1901 and2001 (Marengo 2004). The temperature increase is also evidenced by situations qualitatively described by farmers of heat wavesand reducedincidence of frost with negative impacts on pest control and on the ancient methods of food preservation (CIPCA 2009). The temperature rise in turn has led to an increase in potential evapotranspiration (PET) and, in the case of semi-arid regions, an increase in the aridity index (Garcia et al. 2006).

In its regional projections, and depending on different scenarios and models, the IPCC report expects a temperature increase in the Amazon region between 1.8 and 5.1° C by the year 2050, with half of the used models projecting increases of between 2.6 and 3.7° C. Regarding precipitation, most models do not agree on projections for 2050, and therefore there are no clear trends. The IPCC reports that the eastern part of Bolivia will experience drier winters with reductions in rainfall of up to 15% and more humid summers with precipitation increases of up to 5%. Future trends are the opposite in the southwest of the country (GIZ, 2010).

Precipitation. The average annual rainfall has been highly variable, but the observation of meteorological stations records indicate that, in the last 30 years, there have not been significant changes in rainfall in arid and semiarid regions (*Altiplano*, Valleys and*El Chaco*). However, after 1983 a slight decrease in rainfall has been observed in the *Altiplano* and the Valleys, especially around Lake Titicaca (SENAMHI 2006). In the Amazonian lowlands rainfall appears to have increased slightly. Since 1950 there is a 15% increase in annual precipitation levels in the lower Amazon floodplain (Ronchail et al. 2005).

Also there is a change in the seasonality of precipitation. Observations of theNational Climate Change Program (PNCC, by its acronym in Spanish) show a reduction in rainfall between the months of September-October and an increase in November, which means a shortened rainy period (NPCC 2000). Mayor trends are: (i) changes in precipitation patterns (delay in the initiation of rains and shortening of the rainy season), and (ii) more frequency of extreme events (hail and severe rains).

Most Global Circulation Modelsdisagree about the precipitation projections for 2050 in terms of direction of change, intensity and geographic distribution(IPCC 2007).

The models show the**potential increase in the intensity and frequency of extreme climate events.** In particular, the PRECIS regional model, implemented by Marengo et al. (2006), shows an expected increase in the number of consecutive dry days in the north and a significant decrease in the southwest according tothe Special Report on Emissions Scenarios A2 (SRES A2) from the Intergovernmental Panel on Climate Change (IPCC). The same model predicts an increase in extreme precipitation (maximum rainfall for 5 consecutive days) in*El Chaco* and the Valleys region.

While efforts have been made to have more specific climate projectionsfor the country, the results are not very encouraging. The regional circulation model based on PRECIS, developed by the Friends of Nature Foundation (FAN, by its acronym in Spanish) estimates correct temperature valuesin the Lowlands, but underestimates the temperature values in the eastern region, the region of the Inter-Andean Valleys and the *Altiplano*. Also, very different precipitation values are estimated for the Lowlands,the region of the eastern slopes and the *Altiplano*.

In most cases, observed hydro-meteorological trendsare confirmed by the perception of local communities (see Table 1). Most of the studied communities perceived that in the last 20 or 30 years the climate has been warming and various animals and plants (including crop pests) native to warmer areas are appearing in traditionally cooler areas (World Bank2010). Over 85% of communities in theHighlands, *El Chaco* and the Valleys reported that rains have decreased and become shorter and more intense. People observed that the rivers bring less water or are

completely dry, there is less natural vegetation, and crop yields have declined. In contrast, members of communities in the Amazon region indicated that the rains are starting earlier and ending later. Finally, all communities perceive that the patterns of more intense rains have caused more flooding and erosion.

Communities also stressed the increasing difficulty for predicting the current weather patterns and, therefore, to rely on traditional farming calendars. Over 70% of the surveyed communities confirmed that they had been affected by severe droughts in the last 30 years.

Table 1: Perceptions of local communities on the occurrence of weather events

	Highlands	Valleys	Amazonia	*El Chaco*
General Weather	The weather is unpredictable and severe. Periods of drought and intense heat are followed by torrential rains that generate floods. Also, other extreme events such as hailstorms, windstorms and heat waves have become more intense and frequent.			
Rain	The seasons are less stable, the rains come later and the time between the first and the last rain has shortened. Rainfall is stronger and shorter, the lapses between one precipitation and the other are longer.	Heavier rainfall, spotty precipitation from one year to another. Shorter precipitation cycles and the rains begin later. The dry season is longer (now there is no rain in August and the first rainfall is delayed until December). Localized and stronger rains, frequent "Indian Summers".	Delay of rains, which usually fell between October and February, but now come in January and February until April. On the other hand, the rain falls more heavily and generates "*Ilenuras*" (floods) that have intensified since the 80s. Besides flooding, the locals are also worried by drought.	Delayed onset of major rains. Drought situations that create conditions for further development of pests. Rains are torrential, in a very short time and then there is no rainfall for a long period. "Indian Summers" have become more frequent, threatening crops.
Temperatures	The weather is hotter and does not allow the soil to retain moisture, although some communities benefit from the increased heat.			Because of the higher temperature, the areas for peanut and rice planting dry faster, production decreases and farmers can no longer work in the fields.
Hail	Hailstorms have been frequent in the Puna region. They are unpredictable, with larger hailstones, and affect crop growth.	Hail more frequent and of longer duration, with larger hailstones.		Localized occurrence. Before, December was the last month with hail, but now it is reaching even into January.
Frost	Increased frequency of frost with more catastrophic consequences. It occurs out of traditional season, which affects crop growth and flowering.	Higher incidence in the valleys of Tarija. More frequent at the end of the rainy season.		February and March are typically cold, with frosts, but some years this no longer occurs; frosts are positive for agriculture as they help control pests.
Winds	More "crazy" winds.	The winds push away the rain.		The winds dry the soil faster.
Snow	Where once it snowed a lot, this phenomenon has now diminished. The snow helps to control pests in northern Potosí.			

Source: PNUD 2011

2.3 Extreme weather events

Bolivia is among the countries most affected by climate risks in the region. According to the Global Climate Risk Index, for the period 1990-2009, computed by Germanwatch, and based on impacts and human losses caused by floods, hurricanes and heat waves among others, Bolivia

appears in third place among other countries in South America. The list of countries is led by Venezuela, followed by Ecuador. As seen in Table 2,during the period 2006-2010, Bolivia was ranked first in 2006 and 2007.

Table 2: Global Climate Risk Index, 2006, 2007, 1990-2008 and 1990-2009 Selected countries in South America

Ranking	Short Term			Long Term	
	2006	2007	2009	1990-2008	1990-2009
1	**Bolivia**	**Bolivia**	Uruguay	Venezuela	Venezuela
2	Colombia	Uruguay	Brazil	Ecuador	Ecuador
3	Ecuador	Peru	Ecuador	**Bolivia**	**Bolivia**
4	Brazil	Colombia	Argentina	Peru	Peru
5	Chile	Brazil	Paraguay	Argentina	Uruguay
6	Argentina	Argentina	Peru	Colombia	Argentina
7	Uruguay	Chile	**Bolivia**	Brazil	Paraguay
8	Peru	Venezuela	Venezuela	Chile	Colombia
9	Venezuela	Ecuador	Colombia	Uruguay	Chile
10		Paraguay	Chile	Paraguay	Brazil

Sources:*Global Climate Risk Index 2008, Global Climate Risk Index 2009, Global Climate Risk Index 2010, Global Climate Risk Index 2011*

Disasters produced by hydro-meteorological events, besides causing loss of lives and damagesto a large number of people, also cause great economic losses, which have negatively impacted the country's economic development. The*El Niño*-Southern Oscillation (ENSO), for example, with its aftermath of widespread flooding, seasonal droughts, early frosts, storms, tropical waves, intense hailstorms, landslides, and wildfires among others, affects human settlements and productive sectors alike causing big economic losses and leaving many injured and homeless people. The ENSO event that most strongly impacted the Bolivian territorywas*El Niño* 1982/83, which caused US$837 million (in 1982 dollars) in losses and affected more than 28% of the population (1.6 million). Table 3 presents a comparison of the economic and social impacts of the different ENSO events, *El Niño* and *La Niña*, based on available data.

Table 3: Economic and social impacts of ENSO events in Bolivia

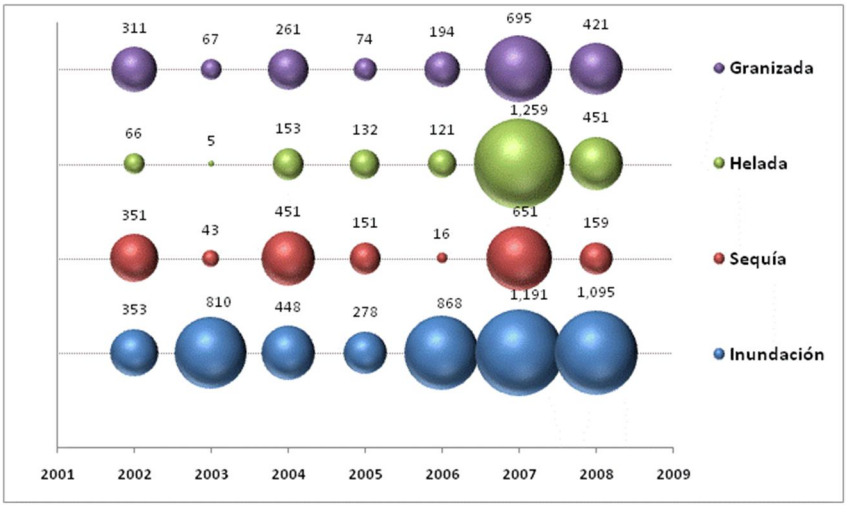
ENSO Event	People affected (in thousands)	Percentage of population affected	Losses (in millions of current US$)	Impact on GDP (%)
1966/68	26.8	0.7%	3.2	0.3%
1973/74	90.0	2.0%	10.5	0.8%
1982/83	1600.0	28.3%	836.5	13.4%
1988/89	283.0	4.4%	48.4	1.4%
1991/92	40.1	0.6%	200.0	3.7%
1997/98	135.0	1.7%	527.0	7.0%
1999/00	417.4	5.1%	151.0	1.8%
2004/05	58.0	0.6%	1.0	0.0%
2006/07	562.6	6.0%	443.3	3.9%

2007/08	618.7	6.4%	529.7	3.2%
2009/10 (Preliminary)	340.5	3.4%	237.1	1.4%

Sources: CEPAL 1982-83, CEPAL 1997-98, CEPAL 2007, CEPAL 2008, CEPAL 2010, EMDAT database, available at http://www.emdat.be/

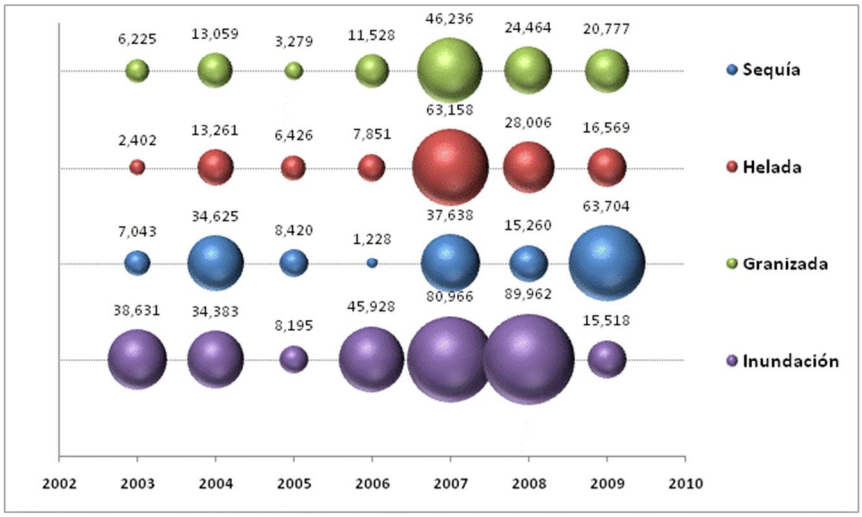
According to data from the Vice Ministry of Civil Defense from 2002-2009 reported by the INE, which is presented in Figures 6 and 7, the country is particularly vulnerable to floods and droughts, which result in serious repercussions for the provision of water resources and food security. During the analyzed period, floods and droughts were responsible for 42% and 16% of natural disasters, and 41% and 23% of affected families, respectively.

Figure 6: Number of adverse events of natural origin



Source: Database of the National Institute of Statistics, available at http://www.ine.gob.bo

Figure 7: Families affected by adverse events of natural origin



Source: Database of the National Institute of Statistics, available at http://www.ine.gob.bo

Floods. The threat of flooding is very high in the macro-basin of the Amazon, which covers two thirds of the country's totalterritory. Floods in the eastern plains occur almost every year during the rainy season, and are a major threat to the basins of the Mamore River and the Rio Grande. The threat of mid-level flooding occurs in the Itenez River basin, the Beni River and the Madre de Dios River. The intensity of floods in the plains markedly increases in the years with an *El Niño* event, which besides floods also provokes droughts in the southwestern and southeastern regions, practically affecting the whole country (CEPAL 2008). The macro-basin of the Plata River is also threatened by mid-level flooding, and the most affected departments are Chuquisaca and Tarija. While flooding is the result of weather related events, human activities such as inadequate planning of human settlements, the indiscriminate logging of forests, interventions in the bed of rivers, among others, also contribute to increase the likelihood of flooding during the rainy season. The areas in the country more susceptible to flooding are listed in Annex 3.

Drought. Drought threatened areas are in the departments of Potosí and Oruro, around the Western Mountain Range, the sub-Andean zones of the *Altiplano,* and the *El Chaco* regionof the departments of Santa Cruz, Chuquisaca and Tarija. According to historical records, the departments that have experienced the highest frequency of droughts during the period 1970-2006 are: Santa Cruz, one drought per year; Cochabamba, two droughts every three years; and Tarija, one drought every three years (PNUD 2011, p. 55). The areas exposed to water deficits and seasonal droughts are concentrated in the valleys of the country's central region (Potosí, Oruro, the area south of La Paz, Chuquisaca, Cochabamba and Tarija), in the area of*El Chaco* and in the *Altiplano* (Annex 3).

Tropical storms. According to the Second National Communication (2009), in recent years there has been an increased occurrence of tropical storms at the country level. In the regions of Santa Cruz, *Yungas* of La Paz, and Tarija winds in excess of 28 m/s (according to the Beaufort scale) were recorded, an unseen phenomenon in long-term historical records. The same document also refers to the occurrence of violent convective movements in the city of La Paz in February of 2002 and 2003, with hail of a magnitude never recorded before.

2.4 Vulnerability of the country to climate change

Bolivia is highly vulnerable to the impacts of climate change mainly due to:

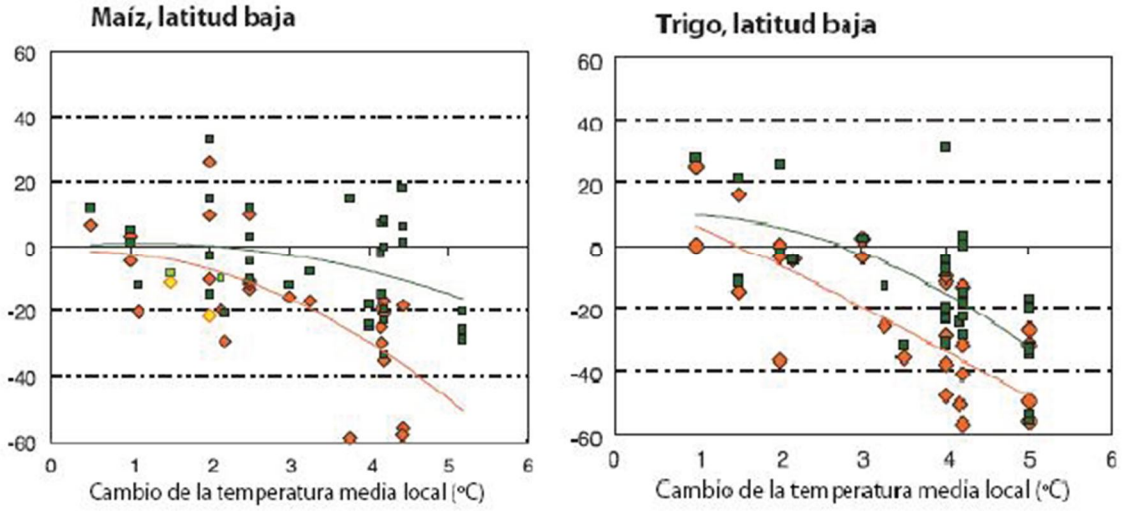
- That its location coincides with South America's region of greater climatic extremes.
- Its physiographic characteristics put it among the countries with greatest biodiversity and ecosystems.As mentioned before, Bolivia is one of the world's eight richest countries in biodiversity (Ibish et al. 2003).
- The ranges for thehuman development index between 0.319 and 0.765 are among the lowest in the region (PNUD 2007). The effects of climate change hit vulnerable groups more directly: the elderly, rural women and children who do not have the ability to migrate in search of employment in the cities, farmers who depend on the rain or the snow to secure their food supply, as well as indigenous peoples who depend on hunting and gathering or the stability of certain eco-systemic functions.

- The country has notable gaps in terms of infrastructure development and a poor coverage of basic services (see Section 1). People with high levels of poverty are more prone to lose water, sanitation and health services during disasters.
- The institutional capacities of the state and the private sector to address the adverse impacts of climate change are embryonic or, in many cases, nonexistent.

Thecountry'sagricultural production and food securitydepends to a large degree on climatic stability, given that over 60% of the rural population lives in mountainous arid and semi-arid areas where livelihoods, especially agriculture, are highly vulnerable to weather alterations as only 10% of the country's cultivated area is irrigated (ERECC-Water IDB 2010).

The rise in temperatures will generate a greater demand for water and an increased incidence of pests and diseases in crops. Water deficit reduces yields of important crops for national food security and may be responsible for total losses in crops as reported in theSecond National Communication (2009) (Figure 8).

Figure 8: Changes in crop yields



Source: IPCC 2007

The gradual increase of temperature is not only changing the landscape and native vegetation seasonality, as well as patterns of wildlife behavior such as bird migration, proliferation of pathogens and vectors, etc. (Anderson et al. 2011), but has also led to a migration of the agricultural frontier toward higher elevation, such as basin headswater and natural areas for water recharge, therefore increasing the human impacts on the ecosystems (e.g. deserts and forests) and, indirectly, on the water availability.

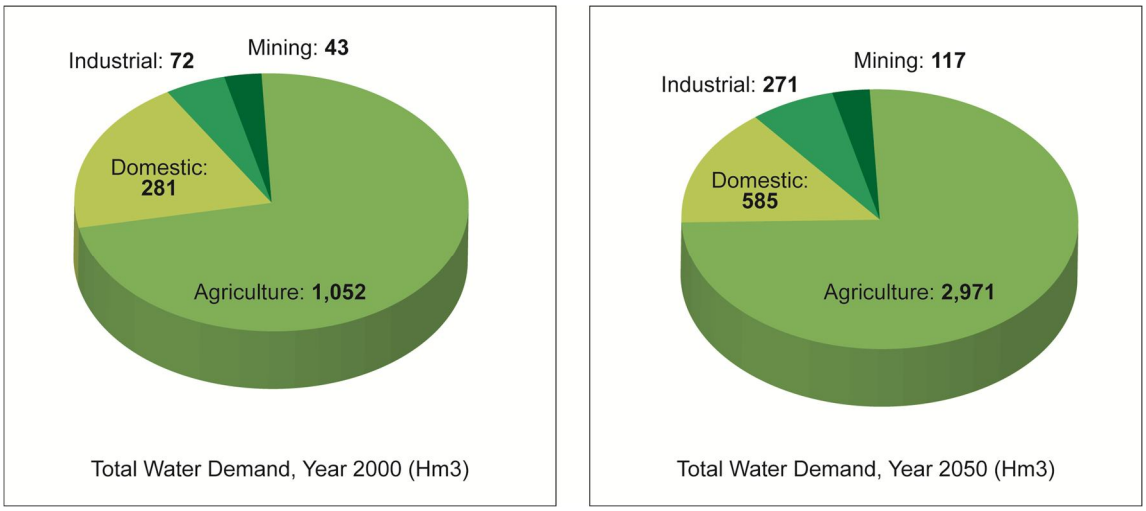
The current situation of water resources

While Boliviais among the countries with greater availability of water resources worldwide (approximately 38,000 cubic meters per capita per year in 2010), water resources distribution, both spatially and temporally, is not homogeneous. The macro-basins of the Titicaca, Salar, Desaguadero River and Rio Grande provide less than 6.000 m^3per capita per year.Manyparts of Bolivia, in particular the western part of the country and *El Chaco*, face water shortage

situations (EACC World Bank 2010). Those water shortages are expected to increase in the future as water demand is increasing as a result of population and economic growths. Water demand is increasing and is expected to triple by 2050(Figure 9).

For now, knowledge of the water availabilityat the country-level is limited. The only effort to develop a nationalwater balance took place in the early 80s. The "*Balance hídrico superficial de Bolivia*" (Surface Water Balance of Bolivia) published in 1992, is the only reference document for hydrologic variables at the macro-basin level (Roche et al. 1992). This study quantifies the country's water availability, at the level of large river basins, based on information for the period 1968-1983. The water balance components that were considered are: precipitation, evapotranspiration and runoff. To date, only the balance of the Pilcomayo River basin has been updated with more recent and more disaggregated information, both at the spatial and temporal levels.

Figure 9: Estimated water demand by sector in 2000 and 2050



Source: EACCWorld Bank, 2010

Possible changes in water resources due to climate change

The projection of future water availability established from the results of the 17 Global Circulation Models (GCMs) of the SRES A2, predicts **decrease in future water availability in the region of the south-central Valleys and *El Chaco*,** which is consistent with historical trends observed in the region (EACC World Bank, 2010).This study demonstrates the potential impact of two extreme scenarios, one dry and one wet. Both agree on a future decrease in the natural water availability in the region of the south-central Valleys and *El Chaco*, consistent with trends observed in the region. The models analyzed also predict a concentration of rainfall in the southwest during the wet season. For the western Valleys and the *Altiplano*, however, the wet model predicts an increase in available water, while the dry model predicts a decrease across the country, this being most severe in precisely those two regions.

Based on the experience of past events, the PNCC has identified the potential impacts on water resources as a result of climate change: changes in river flows due to changes in temperature and precipitation across the country; the excess of water availability and therefore the elevated risk of flooding due to increased rainfall in the east and north of the country; changes in the

regulation of flows due to the rapid retreat of the Andean tropical glaciers in the *Altiplano*, which will have an adverse impact on water availability, agricultural productivity, food security and hydropower generation; changes in precipitation patterns in the tropical forests and *El Chaco* region; the growth of the water deficit due to higher increases in the evapotranspiration than in the precipitation in the *Altiplano*, with the corresponding impacts on agricultural production and food security; and the increase of extreme weather events (floods and droughts), particularly in the *Altiplano*, the eastern region and the Inter-Andean Valleys. These impacts are summarized in Table 4.

Table 4 presents the possible related impacts that might occur in Bolivia in each of the socio-geographical regions, built on the experience of past events.

Table 4: Climate change impacts by region

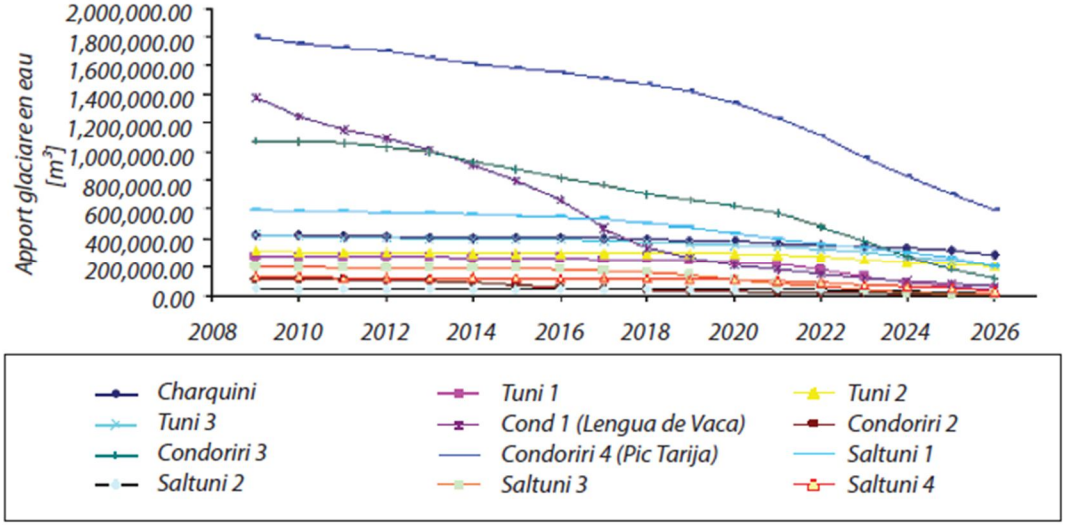
Region	Possible Changes in Climate	Expected Impacts
Altiplano	• Increased concentration of precipitation • Increased frequency of storms with lower number of rainy days • Increased presence of frost • Increased frequency of hail • Reductions in river flows	• Increased need of irrigation for long periods without rain • Problems with power generation • Retreating glaciers • Destruction of crops • Flooding during rainy seasons • Limited availability of water for human and animal consumption • Limited recharge of aquifers and wetlands • Competition for water use
Inter-Andean Valleys	• Increased concentration of precipitation • Increased frequency of storms with a lower number of rainy days • Increased frequency of hail	• Competition for water use • Loss of biodiversity • Increased irrigation needs because of long periods without rain • Increased risks of landslides • Problems with power generation • Soil erosion and desertification
El Chaco	• Reduction in the number of days with rain • Increased periods without rain during the growing season • Recurrent and intense droughts • Low flows in rivers • Heat wave events during the summer	• Competition for water use • Loss of biodiversity • Heat wave events during the summer • Soil erosion and desertification • Increased pollution of water sources
Los Llanos **and the Amazonia**	• Increase in the amount of rainfall received by event • Higher rate of cloudiness • High atmospheric humidity in summer and severe drought in winter	• Frequent flooding and loss of road infrastructure • Loss of winter crops and livestock deaths due to lack of water • Increased presence of pests and diseases due to high humidity • Reduction in biodiversity • Infectious disease outbreaks related to water

Source: ***Programa Nacional de Cambios Climáticos (2007). El Cambio Climático en Bolivia – Análisis, Síntesis de Impactos y Adaptación***

Higher temperature increases in the coming years will significantly affect the Andes Mountain Range (Figure 10). The retreat of glaciers changes the hydrology of the river basins and has a direct impact on freshwater reservoirs and runoffs. In mountain regions, glaciers are a major source of surface water; changes in the quantity and seasonality of flows directly affect water availability. These water resources are mainly used in potable water supply, irrigation, mining

and electricity generation. Retreat of the Tuni and Condoriri glaciers towards 2025 and 2045 will severely affect drinking water storage capacity in the systems of the cities of La Paz and El Alto.

Figure 10: Trends in the contribution of 12 glaciers to the basins of the Andes Mountain Range



The modeling of glacier net contribution until the year 2026, predicts, in a positive scenario, that there is a reduction in glacier contribution to the basins between 30% and 40% and, in an unfavorable scenario, a decrease of up to 70% of this contribution.

Source: Olmos 2010

The increase in evapotranspiration as a result of increased temperature, combined with stable or slightly declining rainfall, has increased the water deficit in most of the already arid and semi-arid areas of the country. This has generated chronic and latent impacts, which could exacerbate periodic and chronic shortages of water during periods of drought in the lowlands and the arid and semi-arid valleys of the country and reduce the availability of water in areas of orographic ascendance (PPCR, Phase I).

Also, the *Altiplano* shows a deficit in its water balance (losing more water than it receives). An increase in temperature affects the levels of potential evapotranspiration (PET). Studies cited earlier (Garcia et al. 2006) made in the *Altiplano*, establish that the water deficit is rising in much of the analyzed stations, mainly due to increased evapotranspiration rather than the decrease in precipitation. Regarding runoff, depending on the variations in climate parameters according to different models, the runoff values tend to increase between 10% and 20% by the end of this century in the case of the Bolivian Amazon (Yates 1997, IPCC 2007).

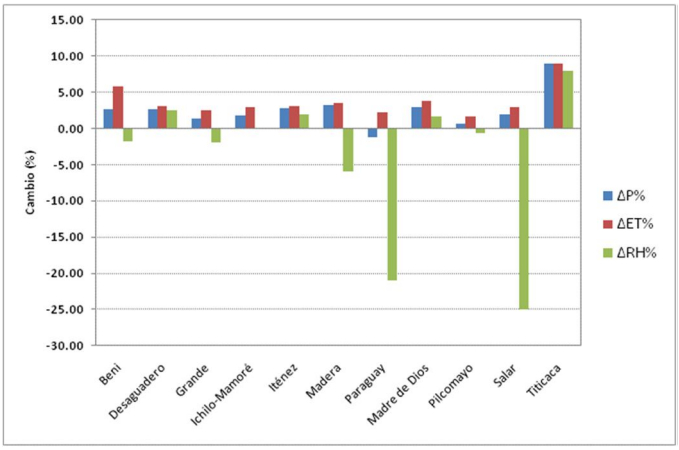
Other studies (Ovando 2010) conducted in the river basin of the Rio Grande (Comarapa sub-basin), based on the Soil and Water Assessment Tool (SWAT) and the Water Evaluation and Assessment Program (WEAP), show an increase in unmet demand for agriculture and drinking water in smaller towns.

These same studies show significant changes in other important local water balance factors such as evaporation, evapotranspiration and runoff. In the Rio Grande basin evapotranspiration is responsible for up to 50% of water loss. The effects of forest conservation and reforestation

(Ovando 2010) increase the availability of water up to 80% by reducing evapotranspiration and increasing infiltration factors.

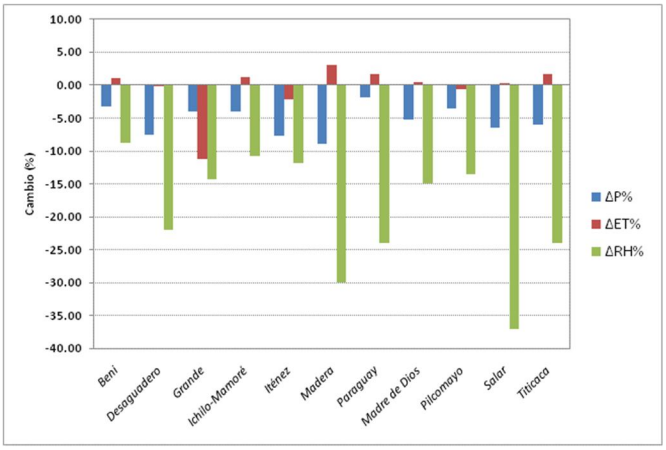
Preliminary projections on expected changes in the water balance components for the eleven macro-basins in the country, considering the dry and wet future scenarios (selected from the 17 GCMs of the SRES A2) for the decade around 2050, which are presented in Figures 11 and 12, reveal that the total annual evapotranspiration will increase in all basins under the wet scenario, while under the dry scenario, evapotranspiration has a greater tendency to rise only in the Amazon region. Regarding water availability, it seems that under the dry scenario, this will decrease in all the evaluated basins, while under the wet scenario, the decline is projected only in the basins of the Pilcomayo, Grande, Desaguadero and Beni rivers. Under this scenario, an increase in water availability is expected in the Madre de Dios and Ichilo-Mamore river basins (World Bank 2010).

Figure 11: Annual changes in water balance components –wet Scenario



Source: ***"Construyendo Herramientas para Evaluar Vulnerabilidades y Estrategias de Adaptación al Cambio Climático en el Sector de Recursos Hídricos de Bolivia",*** **World Bank 2010**

Figure 12: Annual changes in water balance components –Dry Scenario



Source: ***"Construyendo Herramientas para Evaluar Vulnerabilidades y Estrategias de Adaptación al Cambio Climático en el Sector de Recursos Hídricos de Bolivia",*** **World Bank 2010**

Social and gender aspects

Climate change is also creating problems of water security and sanitation in cities across the country, in some cases because of longer dry periods, flooding (e.g. city of Trinidad), or the disappearance of water sources (e.g. glacier and water retreat in the cities of La Paz and El Alto).

Other important impacts of climate change in the health sector and in human settlements, such as increased incidence of vector-borne diseases, notably dengue, have a strong correlation with the low coverage of basic sanitation, floods and poor solid waste disposal (CEPAL-OPS 2010).

Climate change is not gender neutral. It has differentiated impacts as well as responses among men and women (Otzelberger 2011). In most cases, women have higher levels of vulnerability, in particular, women leading their households alone face more difficulties to cope and recover from disasters and climate extreme events (World Bank 2010). Therefore, it is important to know the inequalities in access to and control of resources, rights, capabilities and expertise of both groups. Vulnerability to climate change and natural disasters varies according to the level of exposure to them but also to the ability to deal with and recover from extreme events, which in turn depend on the strategies, knowledge and resources that are available.

To analyze the particular vulnerability of women to climate change in the country, there is one study that stands out among the few investigations done on the matter. This is a study by CEPAL that makes a quantitative analysis of the effects of *La Niña* in Bolivia in 2008 with a gender perspective (CEPAL 2008). As shown in Annex 4, the percentage of affected women is slightly higher than men in 7 of the 9 departments. However, although there seem to be no great differences, due to the many productive and reproductive activities of women, the impact has had a multiplier effect. Another important aspect concerns the changing roles and increased time on reproductive activities that women have had in disaster situations, taking charge of numerous tasks ranging from rescuing the wounded, the provision of food, family care and attending to the sick, as well as land reclamation works (CEPAL 2008).

For a detail explanation of the gender component of the SPCR see Annex 4.

3. Policies, strategies and programs related to climate change adaptation

In recent years, Bolivia has begun to take steps to build a society resilient to climate change. This includes the incorporation of climate change adaptation in the National Development Plan (2006-2011), in some sector strategies/plans and in the design of development programs/projects. This section presents the existent policies, strategies, plans and programs that address the ability to adapt to climate change, all of which are the foundation upon which the SPCR has been developed.

3.1 Policies, plans and strategies

National Development Plan (PDN, by its Spanish acronym) 2006-2011. The PDN is the instrument that guides the development and strategic investments of the Plurinational State of Bolivia. The Plan is organized into four pillars: *Bolivia Digna, Bolivia Democrática, Bolivia Productiva* and *Bolivia Soberana*. Under the plan, the country's priorities are focused on restructuring the national productive matrix using strategic resources such as hydrocarbons and mining to boost the rural economy and food production in order to achieve food sovereignty. Socially, the State seeks to reduce poverty, to improve social integration levels and to reduce social gaps and inequalities through a "dignity" approach that secures the access to food, water and natural resources as a basic human right.

The Plan, in its chapter on environmental resources, Policy 5:*"Adaptation to global environmental changes, protection of the ozone layer, and persistent organic pollutants",* contains a series of programs to improve the resilience of vulnerable systems to climate change. These programs include: (i) the prevention of disasters in vulnerable sectors such as agriculture, as well as rural and urban infrastructure; (ii) adaptation of livelihood systems vulnerable to the deterioration of water resources, with emphasis on agriculture; (iii) adaptation of livelihood systems vulnerable to the deterioration of energy resources, with emphasis on the unsustainable use of firewood; and finally, (iv) an education and awareness program for the prevention of risks and adaptation.

The water and sanitation sector is also one of the highest strategic priorities of the Plurinational State of Bolivia through the PND (*Bolivia Digna* axis), the Government Plan 2010-2015 and the associated Investment Plan, with the ultimate goal of achieving universal coverage of water and basic sanitation. Policy 6:*"Water for All",* recognizes water as a right of all the people and live beings on the territory, and the hydrographic river basin as the unit for planning and managing it.

The National Mechanism for Adaptation to Climate Change (MNACC, by its Spanish acronym) (2007-2016) was developed in a participatory manner and published in 2007 by the Ministry of Development Planning to meet the guidelines of the PND regarding adaptation to climate change. The Mechanism is a strategic tool, a national adaptation plan to be executed over a period of 10 years, which coordinates multi-sectoral activities in response to climate change.

The strategic objectives of the Mechanism are:

- Reducing vulnerability to climate change

- Promote planned adaptation within various sectoral programs
- Reduce the risks of climate change impacts in the different sectors identified as vulnerable

Under the participatory process for formulating the plan, the country's adaptation priorities and corresponding programs were identified. The plan recognized:

- Five sectors considered the most vulnerable to climate change: water resources; food security; health; ecosystems; settlements and risk management; and

- Three major cross-cutting issues related to climate change adaptation to be included within the national development strategies: scientific research; training, outreach and education; and anthropological aspects and ancient knowledge.

The Mechanism does not identify the most vulnerable geographic areas or populations. For each priority sector and theme, the plan includes a program that presents guidelines for reducing vulnerability to climate change in the country and to cross-cut or integrate and reduce risks to climate change impacts.

As will be explained in the section on institutional analysis, the Mechanism has not yet been implemented in its complete scope and reach. *One of the objectives of the SPCR will be to reactivate the Mechanism and advance its implementation, giving priority to water resources issues, training and dissemination.*

BOX 2
Management Objectives of the MNACC

- Reply to the policies of the National Development Plan with actions to adapt to climate change within a comprehensive and multi-sectoral approach, pursuing a high degree of sustainability.
- Strengthen participation mechanisms of the different social and institutional stakeholders.
- Coordinate across sectors the actions to adapt to climate change.
- Support the design of development financing mechanisms that integrate adaptation actions (e.g. investment funds, programmatic and sectoral support, etc.).
- Articulate adaptation actions with other operational actions to be reflected, either in development programs (River basin Management Programs, Irrigation Programs and Project, Health Programs, etc.) or in specific projects, so that they all integrate actions to reduce national vulnerability to climate change.
- Promote the integration of adaptation actions at the community, municipal and departmental levels.
- Support the treatment of the country's response to climate change in discussion forums and strategic planning, at the local, municipal, departmental, and national levels, including processes such as the National Dialogue, Municipal Forums, Research Networks, Reflection, etc.

Initial steps in the implementation of the MNACC. As an element of implementation of the MNACC, the PNCC has generated strategic documents to integrate climate change in different thematic prioritized areas.

In relation to Biodiversity and Ecosystems, it has developed a diagnostic of the areas where it is appropriate to prioritize climate change actions. The document ***Program of Adaptation to Climate Change of Biodiversity and Ecosystems*** (MMAyA 2011 (a) pp. 30) recognizes the importance of taking into account the issue of climate change as a cross-cutting factor in projects aimed at the sustainable use of biodiversity, because it can have a significant impact on the availability, quantity and quality of the biodiversity resources to be employed.

The PNCC has also developed the ***Strategic Program for Strengthening the Capacity for Adaptation to Climate Change in the Context of Food Security and Sovereignty*** (MMAyA 2011 (b)) with the objective of mainstreaming the issue of adaptation in key areas of food production and food security. To confront the effects of climate change on agriculture, two large blocks of main activities have been outlined: water and soil.

The Ministry of Health and Sports has created the document ***Strategic Program for Strengthening the Capacity for Adaptation to Climate Change in the Health Sector*** (MSyD and MMAyA 2001) which defines the lines of work on adaptation to climate change in the health sector.

In the education sector, the Vice Ministry of Science and Technology has defined the ***Strategic Science and Technology Plan: Ancestral Knowledge and Local Knowledge to Address Climate Change*** which aims to: (i) identify and prioritize the needs of scientific research, technological development and innovation required in the processes of adaptation to climate change at the sectoral and territorial levels in Bolivia; (ii) generate scientific knowledge, develop technologies and encourage the technical innovation and technology required in the processes of adaptation to climate change at the sectoral and territorial levels in Bolivia; (iii) identify, systematize and evaluate the ancestral and local knowledge on the subject; (iv) disseminate and transfer the knowledge generated by scientific research, technological development and innovation.

It is appropriate to mention how the regulatory framework impacts on gender. The national regulatory framework, including international commitments and the State Constitution[5], is favorable to the implementation of a gender approach. There are efforts towards achieving equality of opportunity in the context of adaptation to climate change and there is some progress in the sectors of water and environment. However, there are some constraints to be considered:(i) regulation is generally little known by the sectors identified in the MNACC;(ii) there are limited human and financial resources to address the issue in the sectors prioritized by the PPCR; and (iii) the state institutions responsible for ensuring the implementation of gender policies are very weak.

[5]The State Constitution adopted in2009 established a number of relevant articles related to non-discrimination and women's rights, including rights to land and other productive resources. The Equal Opportunities Plan*"Women Building the New Bolivia to Live Well"* has also been developed and approvedin 2009, establishing six priority themes for which all sectors and levels of governance are responsible, and whose vision is to achieve, by 2020, equal opportunities for women to access services, full participation in decision-making and equitable distribution of resources.

3.2 Programs and key projects

Table 5 summarizes the major programs/projects underway related to adaptation to climate change financed solely by government or co-financed by different International Cooperation Agencies (ICA).

These projects/programs cover a broad range of sectors and ministries. From this table it is clear that adaptation to climate change is an issue that attracts much interest from the international community. Most of the programs/projects on adaptation to climate change, like the PNCC operation, have been supported by international cooperation.

Table 5: Programs/Projects funded and under negotiation for adaptation to climate change and disaster risk management (greater detail in Annex 6)

Program or Project Title	Government Institution	ICA	Years	Budget US$(*)	Budget Euros(*)
Project for the Adaptation to the Impact of Accelerated Retrieval of Glaciers in the Tropical Andes (PRAA)	PNCC	WB	4	2,300,000	
Program for Disaster Risk Reduction (PRRD)	MPD - VIPFE MDRyT - VDRA Departments	COSUDE	4	10,000,000	
Support to the extension of the Program for the Environment	MDRyT, MPD	DANIDA	2	25,000,000	
Climate Change Adaptation in the Water Sector (Investment Program)	MMAyA	IDB	2	817,000	
Climate Change Economic Impact Study in the Plurinational State of Bolivia.	PNCC	IDB	2	200,000	
PROAGRO (Water for agricultural production and integrated river basin management)	MMAyA - VRHR	GIZ-ASDI	3		18,000,000
Project for Emergency Recovery and Disaster Management		WB		16,900,000	
Support Program for Resilience Generation in the City of La Paz	GAMLP	UNPD		1,200,000	
Systematization and information to adapt to climate change		UNPD		500,000	
Contingency financing for the comprehensive attention to emergencies caused by natural phenomena	MPD	CAF	4	75,000,000	
Program of Small Grants for Initiatives on Climate Change Adaptation		UNPD	2	2,200,000	
Recovery of Food-insecure Households Affected by Consecutive Natural Disasters	WFP	WFP	2	3,000,000	
Drought Monitoring System in *El*	WFP	WFP	2	100,000	

Chaco					
Support in the formulation of public policies and strategies for post-disaster recovery		UNPD		500,000	
Total				**137.717.000**	**18,000,000**

(*) It does not include local counterpart

4. Institutional analysis

This section presents a brief analysis of the institutional framework for climate change adaptation and disasters risk reduction related to extreme weather events. It presents the degree of participation and interest of civil society on these issues. It also highlights the need to strengthen the institutional framework for climate change adaptation, one of the objectives of the SPCR. It also serves as the basis for defining the arrangements for implementing the proposed SPCR.

4.1 Institutional framework for climate change adaptation

The Ministry of Environment and Water and the **National Climate Change Program.** Following the adoption of the new Constitution in January 2009, the Supreme Decree No. 29894 of February 2009 established a new organizational structure for the Executive Branch of the Plurinational State of Bolivia. Similarly, Article 95 of this Decree establishes the powers of the Ministry of Environment and Water (MMAyA, by its acronym in Spanish) and its Vice Ministry of Environment, Biodiversity, Climate Change and Forestry Development (VMA, by its Spanish shortened acronym) which, among other tasks, must formulate the National Climate Change Policy, drive, monitor and evaluate the operation of the National Climate Change Program(PNCC, by its acronym in Spanish), strengthen the National Mechanism for Adaptation to Climate Change (MNACC, by its Spanish acronym), and implement and evaluate actions to prevent, reduce and mitigate climate change impacts and the adaptation to them, and the formulation of legislation and its regulation.

As a result of this restructuring of the Executive Branch, the PNCC, created in 1995 under the Ministry of Sustainable Development (now Ministry Development Planning) as the operational competent authority responsible for fulfilling Bolivia's technical commitments before the United Nations Framework Convention on Climate Change (UNFCCC), became part of MMAyA in 2009.

The PNCC has the mission to coordinate, articulate, direct and channel efforts to ensure that the country can identify and implement adaptation and mitigation options related to climate change. Specific objectives include: (i) develop National Action Plans designed to cope with and mitigate the effects of climate change within the national policies framework, (ii) conduct studies on the impacts and effects of climate change, as well as studies on adaptation measures, (iii) disseminate information on the topic of climate change on all levels, (iv) build national capacities in the theme of climate change, and (v) seek financial support for projects or activities related to the topic of climate change.

The PNCC has made significant progress:

i. It has influenced public policy and incorporated the climate change topic into planning instruments (Paz 2008).The Government's National Development Plan (2006-2015) recognizes the issue of climate change in the chapter dedicated to Environmental Resources. Some sectors of the State and sub-national governments have included climate change adaptation in their strategies and sectoral plans, although without much detail and in a very incipient form (Paz 2008).

ii. It has been in charge of the preparation of National Communications and Greenhouse Gas Inventories. Two National Communications have been presented in various studies and assessments to evaluate climate change vulnerability and adaptation options in Bolivia.

iii. It has sponsored numerous research studies and funded various projects, usually on a pilot basis, that have improved the knowledge on climate change vulnerabilities of various sectors, regions and vulnerable groups, and define potential measures to improve their resilience to them.

But there is still much to do. The progress in implementing adaptation measures and disseminating information has still been limited. The transfer of the PNCC to the MMAyA in 2009 and the participation in international climate change negotiations by the Foreign Ministry have produced major changes in the national policies on climate change. The PNCC has seen almost its entire staff replaced. Institutional continuity was lost, and so were several of the experts on the subject, some of whom had worked at the institution since its creation (Flores et al. 2011).

Another factor that limits the ability of the PNCC to influence other sectors inside the government structure, is its hierarchy within the structure of the State itself, because by being a subordinate program inside aVice Ministry, it is very difficult to comply with a mandate that requires the participation of several sector heads (vice ministries) and to be a manager of public policy that involves several Ministers and Parliament delegations (Gonzales and Zalles 2010). The lack of financial resources and the dependence on international cooperation resources affect the sustainability of its programs and the management capacity of the PNCC. Finally, the limited availability of basic information, such as reliable hydro-climatological information, has been a problem for the generation of vulnerability assessments and the adaptation of various sectors to climate change.

Institutions involved in the management of climate information. The most important data regarding adaptation are about weather and hydrology, demographics and the state of ecosystems.

The National Service of Meteorology and Hydrology (SENAMHI, by its Spanish acronym) [6]is the main institution responsible for the collection of hydro-meteorological information. SENAMHI is part of the World Meteorological Organization (WMO) with whom it exchanges information and products essential to feed the global system of meteorological and hydrological information and to strengthen its own database.

SENAMHI has a network of 440 national observatories for systematic observation, of which 66 correspond to the hydrological network and 374 to the meteorological network, administered by eight regional offices and a national one. This observation network does not allow for a sufficient coverage of the country and its data sets are incomplete. It is necessary to permanently modernize its technology (satellites, radars, supercomputers or clusters, automatic satellite stations, telecommunications, internet, etc.), incorporate the newest scientific

[6]Created on September 4, 1968, according to the Supreme Decree 8465, it is a decentralized body with autonomous technical and administrative management, which is now part of the MMAyA, with a legal mandate to conduct meteorological, hydrological, and agro-meteorological activities in the country.

advances in meteorology and its applications (numerical modeling, methods and techniques of weather and climate forecasting, regionalized scenarios),as well as integrate itself into the meteorological platforms for satellite observation. SENAMHI has had few financial and human resources, and access to its information by other sectors and the public in general has been difficult.

To address the weaknesses and voids suffered by SENAMHI, the MMAyA, through technical assistance to strengthen the framework for disaster risk reduction given by the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR)[7], has prioritized strengthening the capacity of generating hydro-meteorological information.

Recently, the development of a key instrument was completed, the Institutional Strategic Plan (PEI, by its Spanish acronym) of the SENAMHI, which contains guidelines under which the institution will evolve from 2011 to 2020.

The strategic objectives included in the PEI are: (i) strengthening the weather and climate observation system;(ii) expanding and modernizing the national hydro-meteorological information system;(iii) improving and expanding the spatial coverage of weather forecasts, notices and warnings of adverse meteorological phenomena;(iv) promoting research and development to support operational activities and attend to sectoral demands for specialized information; and (v) strengthening institutional management inside SENAMHI.

The National Statistics Institute (INE, by its acronym in Spanish) maintains and updates the country's demographic and socioeconomic information. A new national population census is in preparation. The last one was done in 2001.

There are several institutions that collect and systematize data on ecosystems, including the National Service for Protected Areas (SERNAP, by its Spanish acronym), the Institute of Ecology, etc., but in general they do it only for the areas in which they are developing projects, the information is not consolidated and it is not always accessible on the Internet.

The PNCC has a mandate to produce data relevant to adaptation, but so far does not have an accessible database. It also has the mandate to analyze climate information. However, it appears that there is no consolidated analysis of historical climate information, or of the various climate scenarios produced.

The PNCC has the mandate to disseminate information on climate change, including adaptation, but it does not do it frequently and regularly. Access to PNCC's information is subject to improvement.

To address the challenges mentioned above, the proposed SPRC has, as one of its objectives, to strengthen the PNCC and SENAMHI in order to improve the climate information system…

Inter-sectoral coordination mechanism: the Plurinational Council on Climate Change *(Consejo Plurinacional de Cambio Climático)*. Adaptation, being a vast area that touches many different development sectors, requires effective coordination activities to avoid duplication and create

[7]Agreement MMAyA/VRHR No. 017/2010.

synergies, both between different sectors and levels of government, and with institutions and civil society.

The main institution intended to generate inter-institutional coordination on the issue of climate change, is the Interagency Council on Climate Change, established by the Supreme Decree 25558 of October 22, 1999. This council was created to "discuss and propose national policies and strategies for implementation of the UNFCCC." 6 ministries and an environmental NGO, the National Academy of Sciences and the Private Sector, were part of this council. However, this council has not met since 2006 despite having an institutional framework in place. In its place, the Government announced in the Second National Communication (2009) that "the Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development has begun the task of forming a Plurinational Council on Climate Change."However, it has not been created yet in spite of its relevance to ensure that climate change issues are incorporated more effectively and across different plans and levels of government.

The lack of a coordination and decision mechanism between key sectors has hampered the process of adaptation to climate change and, in particular, the implementation of the National Mechanism for Adaptation to Climate Change (Flores et al. 2011).

The proposed SPCR has, as one of its objectives, to improve interagency coordination on climate change through: (i) at the level of hydrological basins, the establishment or strengthening of multi-sectoral coordination mechanisms for the formulation of integrated river basin plans resilient to climate change which, in the case of the sub-basin of thePiraí River, will be the Water Channeling and Regularization Service of the Piraí River (SEARPI, by its Spanish acronym) and, in the case of the sub-basin of the Mizque River, will be the Commonwealth of the Southern Cone; (ii) the creation of a national coordinating committee (see Section 6) which could be the Plurinational Council on Climate Change.

Local governments (departments and municipalities). The legal and regulatory framework related to the roles and responsibilities of local governments does not mention climate change adaptation as such. However, local governments, by the functions they have in local development (at the planning, investment and regulation levels), have an important role to play in climate change adaptation.

In the proposed SPCR, departments and municipalities in the pilot basins have an important role in implementing the Investment Program and their capabilities to cope with climate change impacts will be strengthened.

4.2 The institutional framework for disaster risk reduction related to extreme weather events

As explained in Section 2, one of the expected effects of climate change in Bolivia is an increase in the intensity and frequency of extreme weather events.

Although Bolivia has a well-developed institutional framework for disaster management, the country has hardly abandoned the dynamics of responding to disasters only after they occur. Prevention is still very limited. Below is a description of the institutional framework related to disaster management.

Since 2000, Bolivia adopted risk reduction and disaster and/or emergencies response as a state policy, and to institutionalize it, the country has built the following legal and regulatory framework at the national, departmental and municipal levels: (i) Law of Risk Reduction and Disaster Preparedness2140 of October 2000; (ii) the Additional Law 2335 of March 2002; (iii) the Supreme Decree to regulate risk reduction and disaster preparedness 26739 of August 2002; (iv) the organizational laws of the Executive Branch and its regulation; (v) the Law 2446 of 2003; (vi) the Law 3351 of 2006; (vii) the Supreme Decree 29894 of 2009; and (viii) the Law 031 regarding Autonomies and Decentralization, of July 2010.

National System for Disaster Risk Reduction and Attention to Disasters and/or Emergencies(SISRADE, by its Spanish acronym). The Law 2140 of 2000 states that risk management is a process of making decisions to be implemented in risk reduction and disaster and/or emergencies relief based on the knowledge of the risk situation under a short and medium term strategic vision. Consistent with such a definition is that SISRADE was created.

The objectives of SISRADE are: (i) prevent and reduce human, economic, physical, cultural and environmental losses created by disasters and/or emergencies, and rehabilitate and reconstruct affected areas by the interrelation of its components; (ii) the definition of responsibilities and functions of these components; and (iii) the integration of public and private efforts at the national, departmental and municipal levels, both in the areas of risk reduction and disaster relief.

The SISRADE consists of:

i. The National Council for Disaster Risk Reduction and Attention to Disasters and/or Emergencies (CONARADE, by its Spanish acronym) as the highest decision and coordination authority, whose mandate is executed by the Ministry of Development Planning and the Ministry of Defense.

ii. Public and private institutions, and civil society organizations at the national, departmental and municipal levels, related to risk reduction and response to disasters and/or emergencies, as well as instances of technical advice and coordination that would act within the framework of the organization, responsibilities and competences established by law.

All member public institutions of SISRADE that are summoned by CONARADE or the highest departmental or municipal executive authorities to assist in the SISRADE are required to participate in the System within the scope of their competence and jurisdiction. The General Regulation for Risk Reduction and Attention to Disasters and/or Emergencies, through the Supreme Decree 26739 of August 2002, establishes the organization, responsibilities and operation of SISRADE,determines the functions and competencies of the Ministries of Planning Development, the Ministry of Defense and public entities at the national, departmental and municipal levels. It also defines the processes and procedures through which risk reduction will be included in the planning and zoning processes, as well as processes and procedures through which disaster and/or emergencies relief will be include in the planning process.

National Council for Disaster Risk Reduction and Attention to Disasters and/or Emergencies (CONARADE, by its Spanish Acronym). The CONARADE, created under Law 2140, is chaired by

the President of the Republic and is composed of the Ministry of Defense, whose holder shall head the Council in the absence or delegation of the President, and the Ministry of Finance, the Ministry of the Presidency, the Ministry of Development Planning and the Ministry of Government. Other Ministries will be invited by the CONARADE according to the nature and effects of disasters/emergencies.

According to the circumstances and to exercise its mission, the CONARADE may convene public and private institutions, as well as civil society organizations at the national level, linked to risk reduction and disaster and/or emergency response.

The mission of CONARADE is to define national strategies, policies and standards for risk reduction and response to disasters and/or emergencies, as well as the reconstruction and reactivation of the productive processes in areas affected by disasters.

Ministry of Development Planning. The Law 2140 states as functions of the Ministry of Sustainable Development and Planning (now Development Planning)the coordination of actions aimed at disaster risk reduction in the processes of development planning at national, departmental and municipal levels, as well as in the National Public Investment System. Similarly, the Laws on Organization of the Executive Branch redefine the roles of the Ministry of Development Planning and the Ministry of Defense related to risk management and response to disasters and/or emergencies, leaving under the responsibility of the Ministry of Development Planning (according to the last decree for the Organization of the State, effective February 2009) the task of planning risk management with a cross-sectoral medium- and long-term approach in coordination with departmental, municipal and local authorities.

Ministry of Defense. Initially, the Law 2140 established that the Ministry of Defense, through the National Service of Civil Defense (SENADECI, by its Spanish acronym) is responsible for disaster assistance at the national, departmental and municipal levels through the preparation of the population, alert management, and coordination of response and rehabilitation actions, in order to prevent and reduce human, material and financial losses. In addition, the Laws on Organization of the Executive Branch increased the responsibilities of this Ministry in the following way: (i) to propose risk management policies and strategies for their incorporation into the National Planning System and the Public Investment Program;(ii) to plan and coordinate actions for risk prevention and reduction in coordination with departmental bodies, regions, municipalities and indigenous native farmers, as well as with public and private, national and international entities; (iii) to plan and implement actions for the preparation, warning, response, rehabilitation and reconstruction in case of emergencies and disasters, in coordination with departments, regions, municipalities and indigenous native farmers, as well as with public and private, national and international entities; (iv) to systematize and manage information on risk reduction and response to emergencies and disasters, as well as heading and managing the Technical Secretariat of CONARADE;(v) to coordinate with the Ministries of Economy and Public Finance, and Development Planning, the channeling of financial and technical cooperation for development programs and civil defense projects in emergency and disaster situations.

Departmental governments (current functions). The Law 2140 provides that, at the departmental level, the Prefect or Governor is the highest executive authority regarding risk reduction and response to disasters and/or emergencies, needing to assign to one of the functional areas of the current structure of the Prefecture or Department the responsibility of

assuming emerging activities in the mentioned areas in accordance with the relevant legal framework. Also, the Departmental government, while implementing the mentioned activities, shall coordinate with the representation of SENADECI (now Vice Ministry of Civil Defense – VIDECI, by its Spanish Acronym), the necessary actions for the attention to disasters and/or emergencies.

On the other hand, the Framework Law of Autonomies and Decentralization, establishes the following departmental responsibilities for risk management: (i)develop incentive policies to guarantee a steady decline in the existing risk levels in the country, according to the risk classification; (ii) declare a disaster and/or emergency, based on the respective classification, and initiate actions for response and integral recovery in coordination with municipal governments and indigenous native farmers; (iii) regulate, design and establish policies and financial protection mechanisms to deal with contingencies and enable disaster recovery at the departmental level; and (iv) define policies and mechanisms to ensure the financing of disaster reduction risk measures and incorporate them into development management.

Municipal governments (current functions). At the municipal level, the Law 2140 provides that the Mayor is the highest executive authority regarding risk reduction and response to disasters and/or emergencies, needing to assign to one of the functional areas of the current structure of the Municipal government the responsibility of assuming emerging activities in the mentioned areas in accordance with the relevant legal framework. Also, the Municipal government, while implementing the mentioned activities, shall coordinate with the representation of SENADECI (now VIDECI, by its Spanish Acronym), the necessary actions for the attention to disasters and/or emergencies.

For its part, the Framework Law of Autonomies and Decentralization provides the following exclusive powers regarding risk management at the municipal level: (i)be part of SISRADE, which at the municipal level constitute the organic and articulated structures, functional relationships, methods and procedures between municipal entities, public, private and civic organizations, as well as the physical, technical, scientific, financial and human resources required for risk reduction and disasters and/or emergency response; (ii) develop incentive policies to guarantee a sustained decrease in the existing risk levels in the country, according to the risk classification; (iii) declare a disaster and/or emergency, based on the appropriate categorization; (iv) implement comprehensive response and recovery actions charged to their budget; and (v) define policies and mechanisms for financial protection to deal with contingencies and enable disaster recovery at the municipal level.

Trust Fund. On March 5, 2002 the Law 2335 was promulgated, amending the Law 2140,to create the Trust Fund for Risk Reduction and Attention to Disasters(FORADE, by its Spanish acronym), under the tutelage of the Ministry of the Presidency, with the purpose of attracting donations and financial contributions from foreign governments and multilateral and international agencies, aimed at financing plans, programs and projects for risk reduction and disaster response, and to address emerging activities when a disaster and/or emergency is declared. This fund is designed to receive contributions from international or national community and used for the above-mentioned purposes. In addition, at the time of its creation, it was estimated that it would receive annual contributions from the General Treasury of the Nation (TGN, by its Spanish Acronym) equivalent to 0.15% of the total national consolidated

budget. Despite having the appropriate legal framework, the Fund has not been formally activated.

4.3 Participation of civil society and the private sector

The right of public participation in the design of public policies and decisions is enshrined in the Constitution of the country of 2009.

Bolivia is a plurinational country where many cultures and forms of natural resource management converge, in an environment of great diversity between the existing ecosystems, ranging from the high Andean plateaus to the tropical plains. This feature is essential in the decision-making process and the degree of society's participation in adaptation projects, since the latter must respect the worldview and lifestyles of native indigenous peoples and communities.

The People's World Conference on Climate Change and the Rights of Mother Earth (Cochabamba, April 2010) has been the most influential event in the consciousness awakening among broad sectors of the Bolivian population on the importance of the subject (Flores2011).This conference emphasized the need to involve large segments the Bolivian society, especially indigenous and rural native communities in the processes aimed at responding to the challenges of climate change. There were about 20 official representatives from Latin American countries and the rest of the world and about 32,000 people from 42 countries.

The Plurinational State of Bolivia is putting greater emphasis on the economic development agenda and has approved the Law on Communal Agricultural Production Revolution (LRPCA, by its Spanish acronym) which recognizes the principle of a Plural Economy that includes the State economy, the community economy and the private sector. The Law encourages the formation of Community Economic Organizations (OECOM, by its acronym in Spanish) and lays the foundation for their consolidation process through a series of mechanisms and activities so they can participate in the planning and building of their own organization, get more favorable terms to access the universal agrarian insurance, take precedence in case of competition for food provision services, can benefit from matching funds, and so on.

PPCR will interact with multiple key actors and stakeholders in different ways according to the local context in each of the Program sites. In the case of La Paz and El Alto, the involvement of the public-private water company EPSAS is central for the success of the project, as well as consultations and consensus building activities with the community. In the case of the Mizque River, the project will interact with different kinds of public and private organizations, including community based organizations and farmer associations. In similar way, in the Piraí River, interaction will take place with different types of public and private organizations including the Chamber of Oilseed Producers (ANAPO, by its Spanish acronym), the Agriculture Chamber (CAO, by its Spanish Acronym), and other important community organizations and farmer associations.

In the case of women's participation, preliminary investigations of the sectors that will receive support from the SPCR indicate that they have a limited representation in decision-making. There is some gender indicators developed in the National Watersheds Plan, but these

indicators have not yet materialized in actual investments. There is also progress in the management of disasters linked to extreme weather events, for which a working group between the Vice Ministry of Equality and the Vice Ministry of Civil Defense has been established.

The proposed SPCR recognizes the need to involve the different stakeholders interested in its implementation, including women. This is particularly the case for the formulation and implementation of integrated river basin plans, and of the prioritization, design, operation and maintenance of a good part of the structural measures aimed at increasing climate resilience of vulnerable systems on a pilot basis. An effort will be made to involve women in formulating management plans and identifying structural and nonstructural measures.

4.4 International cooperation

As described, most of the programs/projects for adaptation to climate change are co-financed by the International Cooperation. Such is the case with the PNCC which, since its inception, has also been supported by international organizations, receiving funds from the GEF, the Netherlands, Denmark, Switzerland and the UNDP to prepare the National Communications, the Greenhouse Gas Inventory, the Vulnerability Study and the Adaptation Mechanism, as well as to fund training and dissemination schemes, small research projects, and the participation of the Bolivian delegation in international negotiations and the Conferences of Parties (COPs) to the UNFCCC.

There are also mechanisms for coordinating international cooperation, such as the Group of Partners for Bolivia's Development (GruS). This group is a coordinating space formed by bilateral, multilateral and intergovernmental agencies with presence in Bolivia, whose main objective is to support, within the framework of the Paris Declaration, the leadership of the Plurinational State of Bolivia in the coordination and harmonization of the International Cooperation to improve its effectiveness and alignment towards the fulfillment of the objectives of the National Development Plan (PND) and the Millennium Development Goals (MDG), facilitating the dialogue and coordination with public and private institutions and the International Cooperation in the country.

The GruS is comprised of 21 member donors which, since its establishment in 2006, have progressively been strengthening their coordination with the Government and their cooperation towards Bolivia.

The Group works in an institutionalized manner and has the support of several sector groups, such as the Environment and Climate Change Group, that includes a subgroup focused on Climate Change, River basins and Risk Management, which since 2008 works in close coordination with the corresponding government counterparts in different Ministries.

5. Participatory process in the preparation of the SPCR

The Government of the Plurinational State of Bolivia has shown strong leadership and has followed a broad participatory process with various sectors, levels of government and civil society for the preparation of the Strategic Program (see list of workshops in Annex 8).The main participatory processes followed for the preparation of the SPCR include:

PPCR Phase 1 (September-November 2009)

During the development of Phase 1 of the PPCR, a consultative process with stakeholders began in October/November 2009, when two regional consultation workshops where organized, the first in the Highlands/Valleys and the second in the Lowlands. These regional workshops were followed by a national workshop in the city of La Paz in February 2010.In total, the three workshops were attended by 231 participants from different public institutions (national, departmental and municipal), academic institutions, the private sector, NGOs, foundations, and social movements. Among the major findings and recommendations, the importance of integrated and inter-sectoral planning processes and investments, as well as the identification of interventions with a broad regional impact, were highlighted. The need to strengthen institutional capacities was also emphasized.

National Consultation Workshop (November-December 2010)

Two national workshops initiated the consultation process for the preparation of the PPCR. The first workshop was organized in November 2010 with the aim of initiating a participatory process to identify vulnerabilities and adaptation measures to climate change from both the territorial and the sectoral approaches. More than 170 representatives from research institutions, ministries, NGOs, indigenous organizations, regional governments, universities, donors and other civil society organizations of the country's nine departments were invited. The results provided important inputs and, based on its systematization, the second workshop was organized in December 2011.This workshop "Proposals of Sectoral Actions for Adaptation and Climate Resilience", aimed to promote feedback on the identification of adaptation and climate resilience actions in sectors prioritized by the MNACC. As a conclusion of the two workshops, a matrix was created identifying issues where priority action needs to be taken to address climate change, as well as the main areas of intervention. Current baseline of strategies, actions and institutions responsible for addressing those problems were also analyzed.

Sectoral Consultations (June 2010-April 2011)

Sectoral consultations were conducted with a dual focus. First, the National Climate Change Program(PNCC) hired five sectoral specialists to support the prioritized sectors in formulating climate change strategies. Later, a two-day workshop was held in March 2011 during the joint mission of the PPCR, where relevant ministries and government institutions presented their priorities for the PPCR. The March workshop highlighted that many sectors had made some progress with the support of the sectoral specialists, but most of the sectors still had a limited ability to identify projects within the logic of climate resilience. Therefore, the Government considered that the direct involvement of many sectors would be very complex and difficult to operationalize. Instead, it was proposed to apply an integrated river basin management approach, including climate change considerations, which would make the PPCR more focused, without losing multi-sectoral and territorial scope.

Regional Consultations (June-September 2011)

Regional consultations and specific consultations with key stakeholders in each region were organized within the framework of the prioritized sectors, in order to disseminate the SPCR projects and get feedback to improve their design. In the city of El Alto and nearby regions, consultations were held with urban neighborhood associations, community organizations, municipal and regent associations, where a strong interest was noticed in developing options for supplying drinking water for urban areas and irrigation options for nearby rural areas. In the Rio Grande basin, consultations were carried out with various stakeholders, both in the sub-basin of the Mizque River and the sub-basin of the Piraí River. Representatives from departmental and municipal governments, members of various commonwealth associations (*mancomunidades*), civil society organizations, NGOs and universities participated in these consultations. In general, the inputs from the regional consultations revealed that:(i) the plans for river basin management proposed in the SPCR should be linked to production plans and coordinated with existing investments and strategies; (ii) the PPCR should actively involve key players in civil society, the private sector, public institutions and research entities during the formulation, implementation and evaluation (iii) the participation of both women and men would need to be secured, as well as the dissemination of results to both genders. Although the consultation highlighted different interests and priorities between users in the lower parts of the river basins (the mainly urban population) and) and communities in the upper areas of the basins, there also was a constructive environment of cooperation, with concrete proposals on ways in which different stakeholders could support the PPCR.

Gender Approach Consultations (March 2010-September 2011)

Climate change is not affecting women and men equally in Bolivia. Therefore, several consultations were implemented with a gender perspective to complement the general consultation processes. These consultations took place in two stages, the first in March 2010 at a national workshop coordinated by the Social Organization of Rural Native Indigenous Women of Bolivia "Bartolina Sisa", and the second from July to September 2011, at the 3rd edition of the World Social Summit for Women to tackle Climate Change. During these consultations the SPCR project was presented and recommendations for improving its design were collected. The consultations revealed that climate change, together with other factors, has contributed to increased male temporary migration breaking up family units and that, in this context, women are an important driver for climate change adaptation in rural communities but, at the same time, more vulnerable to the impacts of such change. Many gaps in the implementation of a gender approach were identified, as well as the need to empower civil society so it can take sustainable actions that benefit both women and men. Also, the gender approach should be considered and implemented at departmental and municipal government levels. Furthermore, the need to introduce the gender approach in management through a concrete action plan with verifiable indicators and resources specifically assigned for gender work, was also highlighted.

Donor Consultation (February 2011-September 2011)

The donors represented in Bolivia have shown great interest in the PPCR during the formulation of the SPCR. Numerous consultations were held with donors during all the missions of the PPCR (specifically inviting the Donor Group for Environment and Climate Change), and also in bilateral meetings with several major donors. Donors generally expressed high expectations towards the comprehensive approach of the PPCR and the possibility of cross-cutting the issue of climate

change among different sectors. At the same time, they emphasized the importance of harmonizing and aligning the investments planned under the PPCR with already established donors' projects, drawing on the expertise that exists in different sectors, particularly the one related to river basin areas and water/sanitation. Finally, it is worth mentioning that the SPCR preparation has benefited from direct support from several donors including UNDP, Denmark and the Netherlands. Several donors have expressed interest in coordinating and harmonizing the application of the SPCR with its current and future commitments to the relevant sectors and support the agenda of adaptation to climate change in Bolivia.

Overall results of the Consultations

Overall, this extensive consultation process conducted by the National Climate Change Program and the Vice Ministry of Water Resources and Irrigation has involved more than 50 NGOs, 40 civil society organizations, 15 donors and 35 academic institutions, all sectors prioritized by the MNACC, the 9 departments of the country, as well as several municipalities. The consultation showed the broad and distinct vulnerabilities of the Bolivian population, but also a strong interest in improving both the national and local capacity for climate resilience. One of the strengths that was clearly identified is the political will of different levels and sectors to participate and contribute to the implementation of the SPCR. On the other hand, the most evident weakness was the limited level of hydro-meteorological information across the country, as well as the current limited coordination between the different sectors. However, many participants in the consultation process indicate that climate change could provide a good agenda and a forum for improving a cross-sectoral approach in the country, this being one of the key objectives of the SPCR.

PART TWO

6. Foundation for the PPCR support: rationale and prioritization

As highlighted in Part 1 of this document, Bolivia is one of the most vulnerable countries to climate change in Latin America (see Section 2).The gradual increase of average temperature and the increase in frequency and intensity of extreme weather events is already evident, and it is likely that these trends will continue in the future. The impact of these trends on the economy, the welfare of the people and the ecosystems is already being felt and is particularly strong on the rural and urban poor. To achieve the national priorities of "living well" as enshrined in the Law on the Rights of Mother Earth and not endangering the economic investments made by the State in its fight against poverty (Section 1), Bolivia needs to find efficient and effective mechanisms that facilitate a systematic integration of climate change adaptation into its development plans, both at the national and sub-national levels. This includes the ability to handle and manage climate risk reduction in order to achieve a climate resilient growth trajectory.

Reactivate the Mechanism for Adaptation to Climate Change. Bolivia has been working for over a decade to lay the groundwork to address the effects of climate change. In particular, it has clearly included adaptation to climate change as a priority in its National Development Plan (2006-2011) and has approved the National Mechanism for Adaptation to Climate Change (MNACC, by its Spanish acronym)(2007-2016) that includes a multi-sector action plan to build resilience to climate change and reduce the impact of extreme climate events. This Mechanism (the action plan and accompanying institutional arrangements for its implementation) has not yet been fully implemented (Section 3), and one of the objectives of the SPCR is to contribute to its full implementation, most importantly when considering the large number of entities involved and the programs/projects co-financed by donors on issues related to climate change adaptation.

The "sector" of water resources as a starting point of the SPCR. By using a participatory scheme, the MNACC has established 5 priority sectors (water resources, food security, health, ecosystems, infrastructure, and disaster risk management) and 3 transversal priority themes (research, training, and ancestral knowledge) for adaptation to climate change (Section 3.1).During the preparation of the SPCR, and in particular during the consultation process, it was concluded that the dispersion of attention across many sectors and issues would water down the positive impact of the PPCR and complicate the coordination and further implementation of the Program. The consultations also revealed the need to better understand the causes and extent of observed climate change effects, in order to define more precise approach and structure the program with the greatest possible impact during Phase I of the SPCR (Section 5).Section 2 shows that in Bolivia the biggest effects of climate variability and change in the last 30 years are increased intensity and frequency of droughts and floods, as well as landslides. During the 2001-2009 period, the number of people affected by these increased occurrences reached six million. All other effects combined(epidemics, extreme temperatures, storms and fires) have had a much less significant impact. The underlying changes in the hydrological cycle that are behind the increased occurrences of drought, floods and landslides are multiple. In general, droughts are caused by the interaction of two elements of the hydrological cycle: low levels of precipitation (or increasingly interannual variability) combined with higher levels of evapo-transpiration, caused by higher temperatures. Droughts generate adverse conditions for the availability of drinking water, agricultural production and other sectors' water needs.

Meanwhile, floods and landslides are mainly due to excessive rains and a reduced ability for water absorption and drainage in the affected area.

Additionally, the importance of better water management was confirmed in the study on Economic Costs of Adaptation to Climate Change, which describes that among 14 communities in 14 different regions, all of them gave priority to water management as their primary concern (EACC World Bank 2010).

Most of the effects of climate change on the welfare of the population, the economy and the ecosystem are related to the hydrological cycle one way or another (increase in water scarcity, increased intensity and frequency of extreme weather events, etc.). Moreover, the increased frequency and intensity of extreme events (droughts and floods) has direct or indirect impacts on agricultural production, food security, infrastructure and human health. Similarly, the increase of water shortages has an impact on the multiple users in the river basin through the availability of drinking water (with indirect impacts on human health), and of water for agricultural and livestock production(with impacts on food security, income from agricultural exports, and rural and urban poverty), for the production of hydropower, for mining and industrial activities, and for the ecosystem. Therefore, focusing on better water management allows to focus interventions within a single sector (water resources), but to impact several more sectors (such as required by the principles of the SPCR). It was therefore decided to focus the activities of the SPCR on the management of water resources.

Approach to Integrated River basin Management (IRBM) as a key element in adapting to climate change. The Government decided to address adaptation to climate change by adopting an IRBM approach, as it is at the basin level that the hydrological cycle is defined and coordinated adaptation actions are most efficient, including those for the management of climate risks (drought, famine, etc.).In addition, the Government of Bolivia, according to the National Development Plan (Policy6, "Water for all") recognizes water as a right of all living beings and the river basin as the unit for the planning and management of water resources.

Within the IRBM approach, plans, programs and projects to improve the management of water resources and associated natural resources are implemented so the users' current and future water requirements in quantity and quality can be met (both for human activities and the environment) when they are needed and within the limits of the river basin. Management measures include both structural and nonstructural elements. All the different categories of users are involved in the IRBM approach: civil society, sector specialists, local national and sub-national government entities, etc.

Furthermore, there is no lack of political will to adopt the IRBM as a tool for territorial and multi-sectoral planning in the context of the Integrated Planning System of the Bolivian State (SPIEB, by its Spanish acronym) which is under development[8].A well-implemented river basin approach that integrates information on the projected variability and changes in climate patterns would have positive spillovers in multiple sectors.

[8]Sectoral planning has prevailed in Bolivia, extending to sub-national levels; however,the water sector has been promoting a regional planning approach at the river basin level. The government's intention is to make the transition,in a still undetermined period, to territorial planning with an integrated approach.

Territorial prioritization. It was decided to concentrate the SPCR's efforts in two geographic areas of high priority for the country facing issues of a different nature: (i) a basin in the western part of the country at an altitude of over 3,000 m in which a group of actions, including the design and construction of engineering works to transport water (diversion), as well as river basin conservation and management plans will be carried out, thereby contributing to increase the resilience of the entire water supply systems of La Paz and El Alto and (ii) the Rio Grande Basin in the central part of the country, at altitudes ranging from 400 to1500 m, because of its importance for the country's food security and the high potential socio-economic costs generated by flooding, particularly in its lowlands, and droughts. The Río Grande covers 10% of the land surface but is home to over 30% of the country´s population and generates around 40% of the national economic output. The lower part where the pilot sub basin Piraí is located is in the centre of the Norte Integrado Region where 98% of Bolivian agroindustrial production is generated. But that same plain is increasingly threatened by floods causing presently mean annual losses of around US$100 million. A key thread to the Norte Integrado plain is the accelerated land degradation in the upper and middle watershed where extreme poverty, overexploitation and climate change conspire in a vicious circle. It is in this middle watershed where the second pilot sub basin of Mizque is located.

7. The SPCR structure

The objective of the proposed SPCR is to strengthen Bolivia's capacity to define and implement an Integrated River Basin Management approach as a pivotal element of a strategy of adaptation to climate change at the national level (Component 1) and in two priority river basins (Components 2 and 3) (Figure 13).The SPCR will support efforts to capture lessons learned resulting from the adaptation pilot activities in the priority basins, as well as international best practice examples, for its potential replication in other parts of the country. In addition, specific efforts will be made at the international level to disseminate lessons learned and gained practical experience during the implementation of the SPCR, using the exchange forums offered as part of the Climate Investment Funds.

Here is a brief description of the three components of the SPCR:

Component 1: Strengthening national capacity for managing climate change

This Component is aimed at strengthening national capacity to integrate climate resilience aspects in the planning, management and investment processes, and integrate lessons from the pilot activities in the other two components of the SPCR. Specifically, this component seeks to: (i) strengthen existing mechanisms for collecting data and information from hydro-meteorological observations and climate change scenarios, and ensure their maintenance, quality, availability and access, (ii) improve the institutional capacity at national and sub-national levels in the public sector for the management of hydro-meteorological information and climate change scenarios and their direct application in RBM, (iii) improve existing mechanisms for integrated and participatory river basin planning to articulate sectoral and regional approaches in national planning processes with an emphasis on climate resilience, based on lessons learned and best practices (iv) adjust the instruments of the National System of Public Investment (SNIP, by its Spanish acronym) in order to include climate change criteria, at least in public investments related to the management of water resources; and (v) ensure the coordination and comprehensiveness of the program.

The indicative budget for this Component is US$ 6.11 million. The requested donation from the PPCR for this Component is US$ 5.5 million. This Component is described in more detail in Section 10 of this document.

Component 2: Climate resilience program for the water and sanitation system of the metropolitan areas of La Paz and El Alto

The overall objective of the Program is to increase the resilience of the entire water supply system of La Paz and El Alto. The specific objectives are: (i) to guarantee the continuity and the quality of the water system in the metropolitan area of La Paz and El Alto; (ii) to expand service coverage; (iii) to generate experiences and lessons to integrate climate change in the planning, design and implementation of water projects in mountainous areas; (iv) to start the preparation and implementation of a pilot Integrated River basin Plan that is multipurpose, participatory, sustainable, resilient and addresses gender issues; and (v) to lay the groundwork to have a climate resilient water system for the metropolitan areas of La Paz and El Alto.

It is expected that investments in water and sanitation in this metropolitan region will reach over US$200 million in the coming years (see Annex7).However, if the potential impact of climate change on available water resources (retreat of glaciers, decrease in annual storage capacity, etc.) are not taken into consideration, it is expected that the vulnerability of the system will increase over time putting the reliability of the water and sanitation systems in these cities of great importance to the country (they are home to the government of Bolivia) at risk. The MMAyA, through its Vice Ministry of Water and Sanitation, will be the coordinating agency of this Component, in close collaboration with the Vice Ministry of Water Resources and Irrigation (VRHR, by its Spanish acronym)and the Social Public Company for Water and Sanitation (EPSAS, by its Spanish acronym).

The estimated investment related to this Component during Phase II of the PPCR is US$ 206 million. The requested donation of resources for this Component of the PPCR isUS$44.5 million. This Component is described in more detail in Section 11 of this document.

Component 3: Strengthening resilience to climate change in the Rio Grande basin

The main objective of this Component is to increase resilience to climate change in two pilot sub-basins of the Rio Grande basin: the sub-basin of the Mizque River in the upper basin and the sub-basin of the Piraí River in the lower basin. A second objective is to generate concrete experiences in the planning, design and implementation of integrated investments that are resilient to climate change, whose results and lessons learned can be used to be replicated in other regions. The Sub-components include: (i) the formulation/update of a participatory integrated water management plan in each of the selected sub-basins (Mizque and Piraí); (ii) the improvement of the information system of the sub-basins; (iii) the implementation of structural and non structural measures (sub-projects) to enhance resilience to climate change; and (iv) the creation and implementation of institutional arrangements for the formulation and implementation of the above mentioned activities.

The estimated total investment for this Component is of US$ 61 million, of which US$ 50 million are requested as a concessional loan from PPCR resources. A 20% local contribution for both sub-basins is expected from regional entities.

Link to Phase 1 of PPCR

Figure 13: Linkages between PPCR (Phase I and Phase II) and MNACC

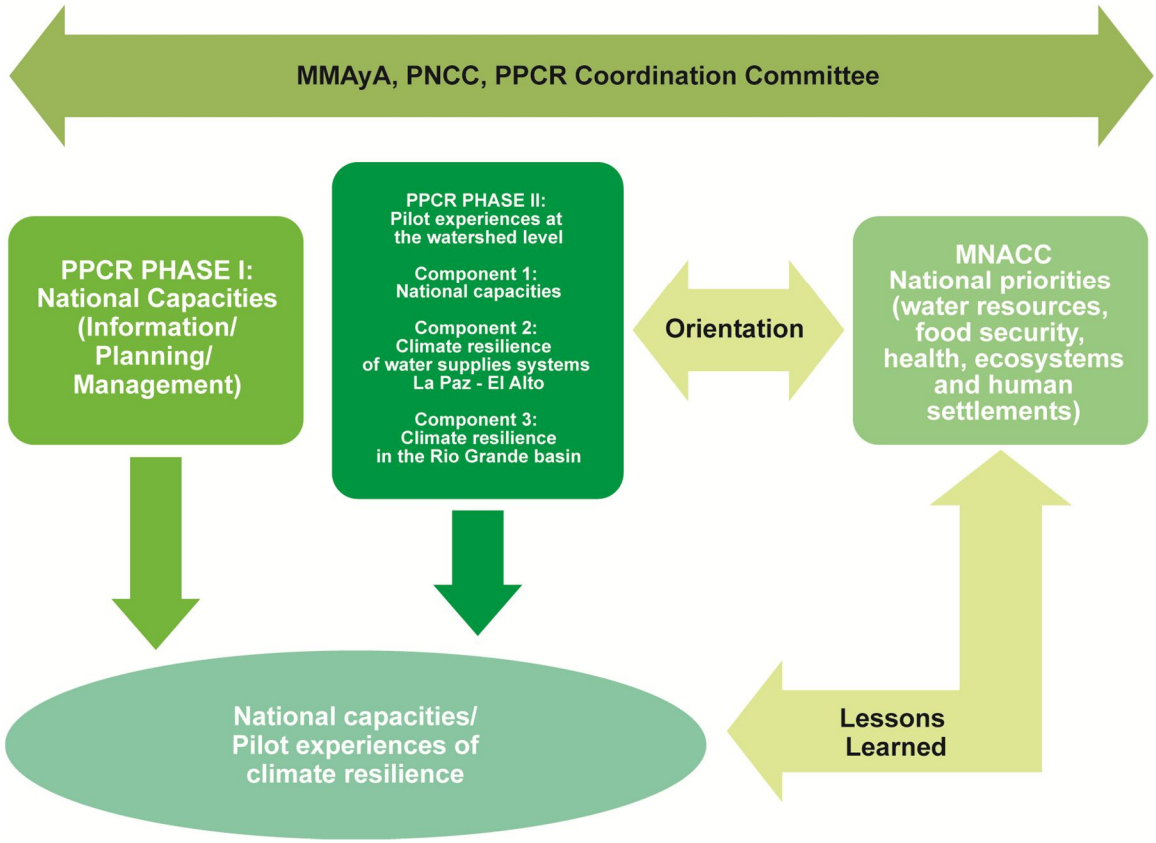
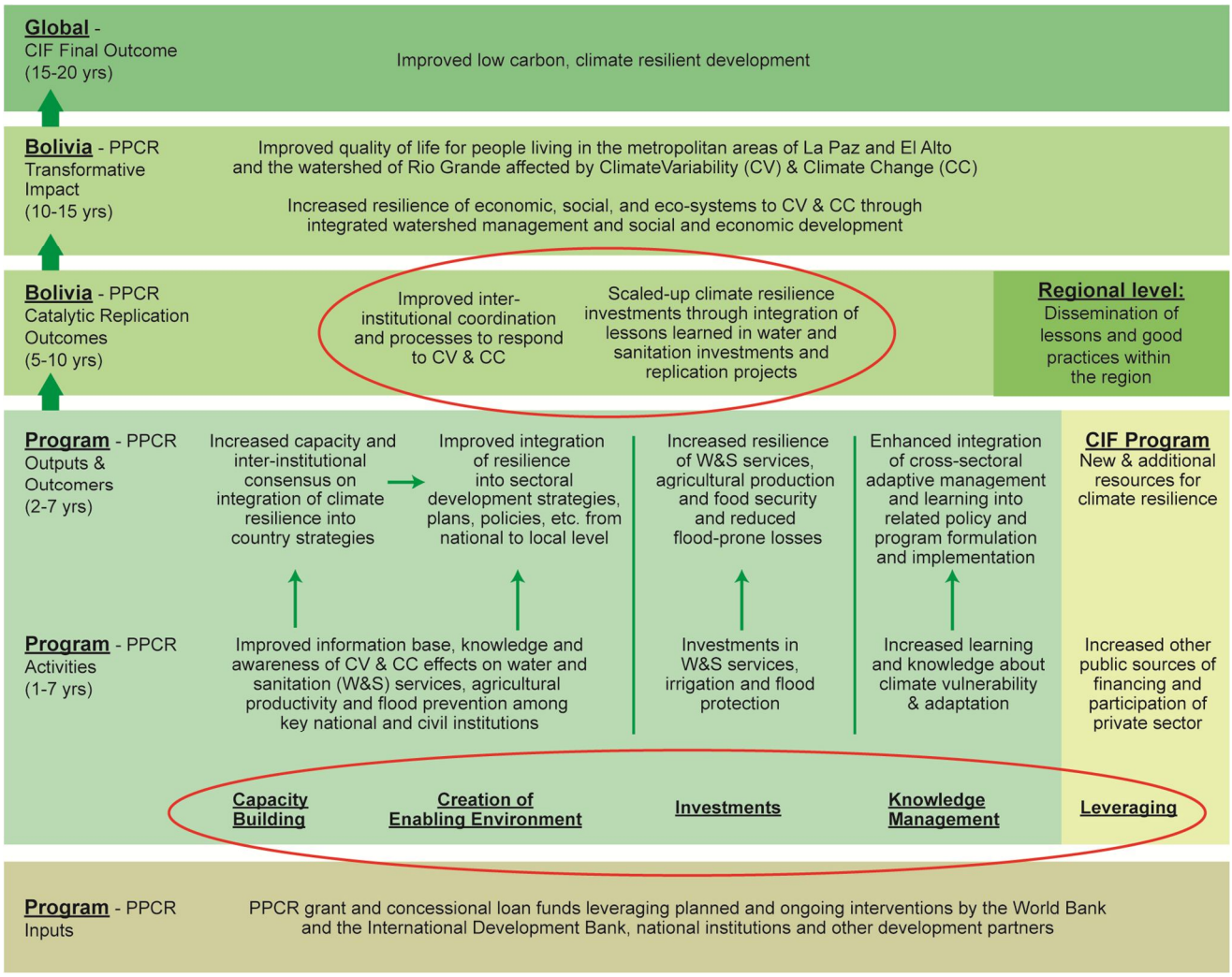


Figure 14: Global Logical Model CIF/PPCR applied to the SPCR in Bolivia



8. Budget, financing and timeframe

The indicative budget allocations for each Component are presented in Table 6, with a request for PPCR resources totaling US$ 110 million (US$50 million in grants and US$ 60 million in concessional loans).However, determining the exact amount of required funding will be done during the detailed preparation of each Component. A lead agency is assigned for each of the Components, according to the Government structure, as well as the policies and mandates of the respective agencies. All lead agencies have shown a strong commitment to effectively implement the Components and to capture the lessons learned to replicate them in other areas and sectors. When budgets are developed, they will include specific funds to promote gender issues and the dissemination of lessons in investments, both during preparation and during implementation.

All three components are tentatively expected to be approved in November 2011, at which date the preparation work will begin. Preparation will last approximately one year. Following that, the Components will be implemented for an estimated duration of 6 years

Table 6: Financial resources required for the PPCR in Bolivia

	Financial resources required for the PPCR (US$ million)				
Components	**Implementing Agency**	**PQ estimated investment requirements**	**Resources from the PPCR**	**National counterparts***	**Additional funding needs**
Component 1: Strengthening the national capacity for managing climate change	WB	6.11	5.5 (Grant)	0.61	0.0
Component 2: Climate resilience program for the water and sanitation systems of the metropolitan areas of La Paz and El Alto	IDB	206	44.5 (Grant)	103.3	58.2
Component 3: Strengthening the resilience to climate change in the Rio Grande basin	WB	74.1	60.0 (Loan)	14.1	0.0

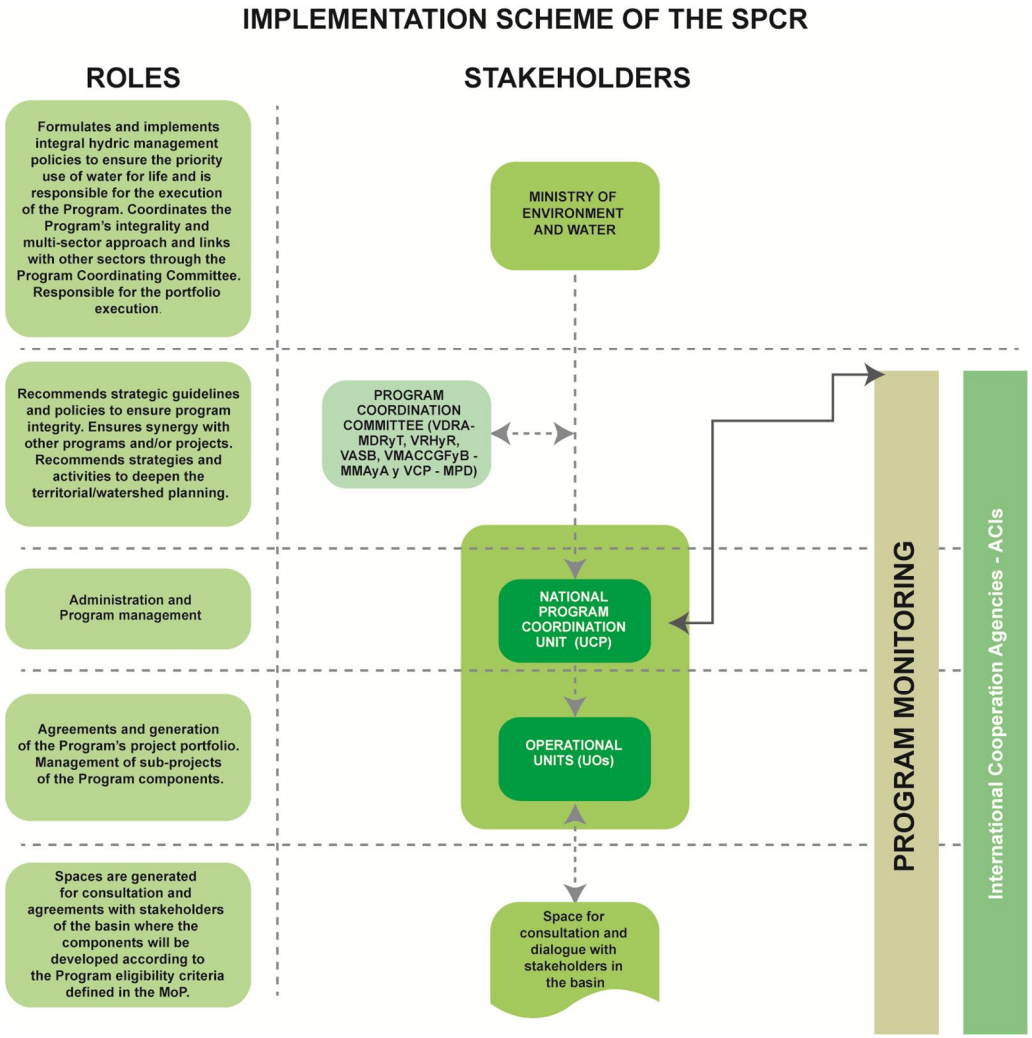
* Through concurrency schemes: national government, sub national governments, direct beneficiaries

9. Arrangements for the implementation of the Program

Arrangements for the implementation of the three components of the SPCR are presented in the following paragraphs and Figure 15.These will be described in more detail during the preparation phase of the Program.

The arrangements are designed to ensure that the implementation of the second phase of the PPCR remains agile, effective, efficient, with clear lines of responsibility, and with inter-institutional and trans-sectoral coordination elements that lead to a more climate resilient socio- economic development of Bolivia.

Figure 15: Institutional arrangements for implementation of the SPCR



The main elements of the organizational structure to implementing the program are:

a. The **National Program Coordination Unit (UCNP, by its Spanish Acronym).**The UCNP, located within the Ministry of Environment and Water (MMAyA, by its Spanish acronym), will be responsible for the coordination and implementation of the Program. The

Plurinational State of Bolivia will ensure that this Unit has the necessary resources, including managerial, technical and financial execution capacities, for the effective implementation of the Program. The UCNP will have administrative, financial and budgetary autonomy, and will report directly to the MMAyA.

b. The UCNP will have **Operating Units**(UO, by its Spanish acronym)located in areas prioritized by the Program. The functions of the Operating Units will be defined during the preparation of the Program. The Units will have the responsibility to implement each of the components of the Program and will serve as the primary contact point between the Program and the beneficiary communities.

c. **Coordination Committee.** A coordination committee will be established to ensure that other ministries and key sectors are involved in the Program (PPCR) and that a proper coordination is established between the respective programs of each sector/ministry and the proposed Program. The responsibilities of this Committee are to ensure a smooth, swift and efficient implementation of the Program, to provide guidance to secure a multi-sector and synergic approach with other sector/ministry programs, and to ensure good coordination between national sectoral planning and river basin territorial planning. Also, it will annually send reports on the state of the Program implementation to the WB, IDB and IFC. The Committee will be chaired by the Minister of Environment and Water and include the presence of: (i) the three vice ministries of the Ministry of Environment and Water (MMAyA): Water Resources and Irrigation (VRHR, by its Spanish acronym), Water Supply and Basic Sanitation (VASB, by its Spanish acronym), and Environment, Biodiversity, Climate Change and Forest Management (VMA, by its shortened Spanish acronym); (ii) the Ministry of Rural Development and Land (MDRyT, by its Spanish acronym) with its Vice Ministry of Rural Development and Agriculture (VDRA, by its Spanish acronym);and (iii) the Ministry of Development Planning (MPD, by its Spanish acronym) with its Vice Ministry of Planning and Coordination (VPC, by its Spanish acronym).The National Climate Change Program (PNCC, by its Spanish acronym) will be the Technical Advisor of the Committee. The General Coordinator of the UPNC will act as Secretary of the Committee.

d. **Financing agencies (WB and IDB) and international cooperation agencies (ICA's).** The WB and the IDB, as well as other international agencies involved through specific agreements, are the financing entities of the Program. They contribute with loan and grant resources and operate with administrative and financial implementation rules and procedures defined in their Operations Manual (MOP, by its Spanish acronym).Other ICA's would be able to contribute with additional resources for the implementation of the Program components during its execution.

e. **Spaces for consultation and agreement.** This is where the dialogue and consultation with stakeholders in the basin will take place. In addition to addressing the historical and constitutional right of the communities to participate, these spaces will allow the dissemination of information, the achievement of agreements and consensus to facilitate the efficient implementation of the Program and the accomplishment of its goals and objectives. An added benefit will be the inclusion of women in the process, most importantly those women that are usually left out of community decision-making, with specific consultation events that could be organized for their participation.

f. **Local governments (municipalities and departments)/beneficiaries** will be involved in identifying and financing the structural measures (sub-projects) to increase resilience to climate change in the pilot basins.

10. Component 1.Strengthening the national capacity for managing climate change

A. Background

In Bolivia, most of the impacts of climate change are manifested through their effects on the hydrological cycle (see Sections 2, 3, 4).Therefore, improving integrated river basin management becomes the main venue by which the Program will build resilience to climate change. While Components 2 and 3 will apply an IRBM approach to priority pilot areas, Component 1 will create the tools, mechanisms and methodologies that will allow this approach to be successfully applied in other basins of the country. For this purpose, Component 1 will focus on improving the information base by strengthening data availability, data analysis and the generation of information required to diagnose and develop responses to climate change in the water sector; as well as on strengthening public sector capacity to replicate the experiences of the pilot areas.

It is through Component 1 that the experiences from the pilot projects (in Components 2 and 3) will be mainstreamed into water resources management in Bolivia as a whole. Component 1 will allow the PPCR to achieve its transformative impact of integrating climate change considerations across the spectrum of public management activities. This will require continuous feedback and learning mechanisms from the PPCR pilots, as well as the other water resource management projects that Bolivia is pursuing.

Climate modeling, evaluation of the vulnerability of water resources to climate change, and the formulation of adaptation measures, are all severely limited by the weakness of the existing hydro-meteorological databases and the limited number of low-resolution climate scenarios for Bolivia.

Hydro-meteorological information is not systematically available, and significant gaps in terms of its spatial and temporal coverage exist, while the available climate change scenarios are not detailed enough. For certain areas (especially urban ones), there is information about the changes in temperature and rainfall over time, but for rural areas, this information is deficient. The lack of reliable and continuous information over at least 30 years, complicate the assessment of climate variability and the generation of projections and scenarios for the future.

For the country to successfully implement an IRBM approach in response to climate change, a first need is to improve the availability and accessibility of hydro-meteorological information, including the strengthening of institutional capacity at central and sub-national levels to process and use this information.

While climate modeling efforts have been made in the past and are currently being made in the country, usually these efforts are somewhat fragmented and coordination between the different groups and institutions involved is incipient. The impact of the PPCR in Bolivia can be greatly enhanced if the applied approaches and the results obtained in the pilot projects

(Components 2 and 3) are systematized and made available for other basins, activities and sectors.

Therefore, Component 1 will collect and systematize the lessons learned in the pilot projects and develop the capacities to allow the use of the IRBM approach in other basins in Bolivia. Water management in river basins requires a multi-sectoral approach to ensure the best responses and major attention will be given to the integration of other sectors. Component 1 will also develop the work methodology, including a multi-sectoral and participatory planning of river basin management that facilitates collaboration among the various sectors.

Component 1 is strongly associated with Phase I of the PPCR and will allow a harmonious continuation of activities initiated in this first phase, particularly the information system and the integration of climate change considerations in the national planning processes. Component 1 will also be linked to coordinate the introduction of the topic of climate change in the redesign/update of the National River basins Plan and the consideration of the basin as the planning unit within the mechanisms of adaptation, ensuring greater participation of the sectors.

B. Objectives

The overall objective of Component 1 is to strengthen the national capacity to integrate climate resilience in public planning, management and investment, and to mainstream the pilot experiences with the IRBM approach. The specific objectives are:

- Strengthen the capacity for collecting, analyzing and disseminating hydro-meteorological information and for maintaining and updating a range of high quality climate change scenarios.
- Improve institutional capacity in the public sector to manage hydro-meteorological information and climate change scenarios and their application in IRBM.
- Based on lessons learned, develop recommendations and best practices for mainstreaming integrated and participatory river basin planning in national planning processes with emphasis on climate resilience.
- Strengthen capacity to mainstream climate resilience in public sector management, with special emphasis on water resources, food security and disaster risk.
- Ensure the coordination of the Program.

C. Key indicators and benchmarks

According to the stated objectives, key indicators of this Component are:

- Number of investment projects related to IRBM using concepts and/or methodologies developed under the SPCR
- Number of institutions, at the national and sub-national level that have integrated climate resilience issues in their work plans and procedures

- The availability of climate change scenarios of high resolution in the areas of intervention, that are easily accessible to decision makers, experts and the general public
- Reliable and easily accessible hydro-meteorological information, available to the public
- Volume of use of the SENAMHI and PNCC websites and related social media
- Number of institutions where relevant staff, disaggregated by sex, has been trained in the use of high resolution scenarios and other climate information to help in decision making processes
- The availability of methodological guidelines on river basin planning and of modified project preparation guidelines
- Number of publications on methodologies applied and lessons learned under the SPCR
- A mechanism for monitoring and evaluation (M&E) has been established in national and sub-national government institutions to measure achievements towards reducing vulnerability to climate change

D. Sub-components and activities

This Component includes the following Sub-components:

Sub-component 1: Strengthening of the National Climate Information System
(Total cost: US$ 2.78 million, PPCR $ 2.5 million)

Strengthening the National Climate Information System will develop the capabilities of SENAMHI, the PNCC and other organizations responsible for generating and disseminating information on climate change and hydro-meteorological information. The strengthening of SENAMHI will correspond to the financing of the action plan developed during Phase I of the PPCR derived from the diagnosis of the technical and administrative capacities of SENAMHI and its national hydro-meteorological information system. The strengthening of the PNCC will be based on a diagnosis to be undertaken during the preparation phase of the Investment Program, focusing on the National Climate Information System that the PNCC aims to develop.

This Sub-component will finance the following activities:

i. Strengthening of the PNCC and the National Climate Information System. This activity will include:
   a. The development of a five-year plan based on a thorough assessment of the PNCC and lessons learned from the MNACC on the use of participatory planning methodologies in river basins, and from the designs of public investment projects with resilience to climate change at the sub-national level.
   b. The mid-term evaluation of the five-year plan defined to verify compliance and make adjustments and improvements arising from the experience in the areas of intervention.
   c. Support to strengthen the website of the PNCC and its accessibility to public sector institutions and the public in general.

ii. Support to the PNCC in:

a. Developing a climate change information partnership. This institutional partnership will strengthen baseline information databases and future climate projections as forthcoming from different models. It will also develop high resolution climate change scenarios, evaluate the uncertainties associated with them, and make information from the scenarios available in a way that supports decision making on public and private investments.
b. The development of methodologies for studies on vulnerability and adaptation to climate change of water resources with a river basin approach. This also includes technical training in the collection, verification, interpretation and use of information contained in the climate change scenarios, and the interpretation of uncertainties associated with climate change impacts in decision making.
c. Assisting in structuring a high-level inter-sectoral council to incorporate climate change in the national water resource management priorities. The focus will be on developing the institutional and regulatory framework required for the efficient functioning of this council.

iii. Strengthening SENAMHI and the mechanisms for collecting hydro-meteorological information. This activity will include:

a. Support to the Government's efforts for the restructuring of SENAMHI, including the identification and implementation of measures to ensure its financial sustainability, to allow the continued operation of the information network and to ensure access to the information that SENAMHI collects.

b. Training of the technical and managerial staff of SENAMHI according to the recommendations laid out in the plan developed during Phase I of the PPCR.

c. Funding for software and hardware to improve the hydro-meteorological information system, including the website of SENAMHI, and staff training for its proper operation and maintenance.

d. Improvement of the national hydro-meteorological network, giving priority to the pilot basins (e.g. densification of the observation network, rehabilitation or modernization of existing stations);training for SENAMHI (and other institutions generating hydro-meteorological information) for its proper operation and maintenance.

e. Generation of a standard set of hydro-meteorological information for the period 1980-2010 distributed in the eleven priority macro-basins of the country and in other areas of interest to the Bolivian State (with a grid of 20 km by 20 km resolution), using hydro-meteorological information captured by remote sensors with proven reliability, such as the TRMM (Tropical Rainfall Measuring Mission) from NASA, and calibrated with local data collected by ground stations. This information will also be used to develop and maintain a range of localized future climate change scenarios, based on the Global Climate Change models that exist for Bolivia.

Sub-component 2: Integration of climate resilience in planning, investment, monitoring and evaluation (Total cost: US$ 1.67 million, PPCR US$ 1.5 million)

With funding from Phase I of the PPCR, strategic guidelines will be developed for integrating climate resilience in the National Economic and Social Development Plan. Operational guidelines and indicators to ensure the inclusion of the issue of climate change (vulnerability, risk, response) in the cycle of public investment projects, will also be developed.

The MNACC aims to develop tools to include climate change adaptation in public sector management for water resources, food security and disaster risk reduction in coordination with the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management (VMA), the Vice Ministry of Planning and Coordination (VPC) and the Vice Ministry of Public Investment and External Financing (VIPFE).

The instruments will be developed and disseminated through various activities:

i. Development of methodologies to consider the effects of climate change in the planning of resilient programs and projects. Based on the experience of Components 2 and 3, the Vice Ministry of Water Resources and Irrigation (VRHR, by its Spanish acronym)will develop a methodological guide on river basin management in response to climate change. The guide will be based on multi-sectoral and participatory methodologies, building on earlier experiences in Bolivia and other countries, as well as experiences in the pilot basins. The planning process will include the dissemination of climate change scenarios and further available information collected in the basin; it will be participatory to ensure the collaboration of public and private entities, as well as women and vulnerable groups; and it will provide mechanisms for setting public investment priorities. This activity also includes the development of gender training modules and dissemination of good practices in incorporating a gender perspective in river basin management (see also Annex 4).

ii. Integration of climate resilience in the public investment cycle for activities with a river basin approach. For this purpose, VRHR will modify the Guidelines for the Preparation of Large and Small Irrigation Projects, as well as the Integrated Technical Assistance Guides (ATI, by its Spanish acronym).These Guidelines will be validated by the Coordination Committee and promoted to be included in the National Public Investment System (SNIP, by its Spanish acronym).

iii. Incorporation of resilience to climate change in environmental management tools such as the Strategic Environmental and Social Assessment, and the environmental impact assessment of projects.

iv. VPC and VIPFE (both, parts of the Ministry of Development Planning) will develop activities to further the integration of climate change aspects in investment planning. Best practices and lessons learned from other countries will be reviewed for their suitability in Bolivia. The critical elements required to reduce climate vulnerability in investment planning will be identified and revised procedures will be proposed. Staff from VIPFE, VPC and the other involved organizations will be trained in the application of these procedures.

v. Introduction of resilience to climate change elements in project M&E instruments. M&E instruments will be developed for projects with an explicit focus on climate change and for other projects without an explicit approach to this issue.

Sub-component 3: Program coordination and knowledge management
(Total cost: US$ 1.67 million, PPCR US$ 1.5 million)

The objective of this Sub-component is to ensure the integration of all activities supported by the Program through the implementation of a consistent M&E system and the implementation of information dissemination mechanisms, methodologies, and tools for their use in other geographical areas and sectors.

This Sub-component will support the following activities:

i. Finance the implementation of mechanisms to ensure the coordination of the Program activities, as well as the necessary personnel to ensure the efficient implementation of all Component 1 activities. Within the Ministry of Environment and Water, a National Program Coordination Unit (UNCP, by its Spanish acronym) will be established, from which a small implementation team will run the activities of Component 1 and will have powers to monitor the two other Components, providing the necessary information to comply with its mandate under the proposed implementation scheme, as described in Section 9.

ii. Support the creation/use of tools for the integration of M&E systems in the various components of the Program, which explicitly will include the gender dimension as a cross-cutting issue. While the implementation of Components2 and 3 will be undertaken by other teams, the M&E function will be nationally integrated. The same M&E system will be used in Components 2 and 3.This arrangement will allow for better learning and better exchanges between the teams.

iii. Support an annual meeting to review the achieved progress in the different activities financed through the two phases of the PPCR as well as in other projects that pursue or integrate climate change adaptation. The annual review will identify experiences that can be mainstreamed or multiplied, allow project teams to learn from each other and indicate which changes should be pursued in the pilot projects and the overall program.

iv. Support the collection, compilation and dissemination of knowledge generated in the Program. The PPCR will generate a large amount of information and learning opportunities. The UNCP will have a central communication and public relations unit to ensure that the knowledge obtained through the different components of the Program is available around the country, and also to ensure that the general public and those interested in the work areas can actively participate in the dialogue about the Program. The unit will be responsible for ensuring the availability of updated information in the Program's website and in CIF net, the forum of the Climate Investment Funds (CIF), to share information and knowledge with other countries with similar pilot programs developed through the CIF.

E. Arrangements for the implementation of the Component

Arrangements for the implementation of this Component will be refined during the project preparation phase. In the meanwhile, it is expected that the implementation of the Component will be the responsibility of the UNCP, located inside the Ministry of Environment and Water. The implementation of the Component requires close coordination with SENAMHI, the PNCC

and the Vice Ministry of Planning and Coordination (VPC), with the PNCC taking the lead in the dissemination of the lessons learned and the tools and knowledge generated through the Program. The Component will be implemented and funded through the World Bank, in close coordination with the IDB.

Following the nature of the activities of Component 1, a multi-sectoral and inter-institutional approach will be pursued involving, in addition to the government organizations, the various stakeholders that are supporting the Plurinational State of Bolivia in its response to climate change. Coordination with the donors' community, as well as with civil society organizations, will be actively pursued.

F. Risks

The main risks identified in the implementation of Component 1 are:

- The lack of a commitment to long-term planning by the municipal and departmental governments, which are more used to short-term planning with little technical background and limited information. Unfortunately this situation is widespread in rural municipalities.

- The lack of institutional capacity in public entities and the high turnover of technical and executive staff.

- The predominance of ad-hoc, political decisions over technical decisions based on reliable information. The difficulties to coordinate between different government institutions.

- Decentralization processes create friction between different levels of government and reduce the willingness of the regions that are not included in the Program to get to know, adopt and replicate its results.

G. Cost of investment: Theoretical allocation (PPCR) and co-financing (including the counterparts)

Cost (in US$ million)	PPCR	National	Sub-national and Users	Total
Strengthening of the National Climate Information System	2.50	0.28	0.00	2.78
Integration of climate resilience in planning, investment, monitoring and evaluation	1.50	0.17	0.00	1.67
Program coordination and knowledge management (including preparation costs)	1.50	0.17	0.00	1.67
Total	**5.50**	**0.61**	**0.00**	**6.11**

H. Results framework[9]

Objective	Outcome Indicator	Use
To strengthen the national capacity to integrate climate resilience in public planning, management and investment and to mainstream the pilot experiences with the integrated river basin approach	• Number of investment projects related to IRBM using concepts and/or methodologies developed under the SPCR • Number of institutions, at the national and sub-national level that have integrated climate resilience issues in their work plans and procedures	• Measure whether the Program is achieving its transformative impact
Sub-component 1: Strengthening the National Climate Information System	• The availability of climate change scenarios of high resolution in the areas of intervention that are easily accessible to decision makers, experts and the general public • Reliable and easily accessible hydro-meteorological information, available to the public • Volume of use of the SENAMHI and PNCC websites and related social media	• Measure whether Bolivia has improved the quality of the information
Sub-component 2: Integration of climate resilience in planning, investment, monitoring and evaluation	• Number of institutions where relevant staff, disaggregated by sex, has been trained in the use of high resolution scenarios and other climate information to help in decision making processes • The availability of methodological guidelines on river basin planning and of modified project preparation guidelines • Number of publications on methodologies applied and lessons learned under the SPCR	• Understand whether the PPCR has fulfilled its function of learning and knowledge dissemination • Understand whether the PPCR has contributed to integrating climate resilience in decision making
Sub-component 3: Program coordination and knowledge management	• A mechanism for monitoring and evaluation (M&E) has been established in the institutions of government and the different sub-national levels in the intervention areas to measure the achievements in terms of reducing vulnerability to climate change	• Measure the effectiveness of program implementation

[9]This framework is preliminary and will be reviewed and detailed during the preparation of the respective projects.

11. Component 2.Climate resilience program for the water and sanitation systems of the metropolitan areas of La Paz and El Alto

A. Background and rationale

The metropolitan areas of La Paz and El Alto are the main development center in Bolivia with an estimated population of 2million inhabitants and a population growth rate estimated at 3.5% for the city of El Alto and 0.25% for La Paz. According to the National Statistics Institute, 72.9% of the urban population of El Alto lives in poverty and without adequate access to basic services and products, and of this, 12% live in extreme poverty[10].The rapid increase in the rate of growth in recent years in peri-urban areas of these cities, and especially of El Alto, due to migration from rural areas, has resulted in a rapid unplanned settlement of population in areas where there is no coverage of potable water and sewerage. This situation not only affects the lives of people in these areas, but also creates an additional burden on the water supply system when these communities request the provision of these services to water utility companies (UNDP 2011).

Based on population growth projections, it is estimated that by 2018 the current water supply systems for La Paz and El Alto would face difficulties to meet the incremental demand. Additionally, climate change will result in significant impacts on the water sources that supply the metropolitan areas of La Paz and El Alto. Specifically, seasonal climate variations of rain patterns are expected to occur in the *Altiplano* (Selt et al.)This is coupled with the fact that, of the country's three main basins, the *Altiplano* is the one that receives the least annual rainfall (about 61 million cubic meters).

Consequently, in order to provide assurances that the metropolitan area and all water users in the river basin will continue enjoying a sustainable and resilient water provision, it is necessary to consider a group of actions including: (i) improving the current understanding of climate change impacts on water resources so that projects and programs can be designed to ensure the resilience to climate change in the water supply system; (ii) an assessment of the water supply current system reliability and how it will be affected by climate change over the next three decades; (iii) the conservation of the sources of the existing water supply through integrated river basin management (IRBM) plans; (iv) the search and development of new sources of water supply; (v) the implementation of regulations and education programs for users to ensure the rational use of the resource; and (v) the improvement of the existing distribution systems and water usage to reduce losses.

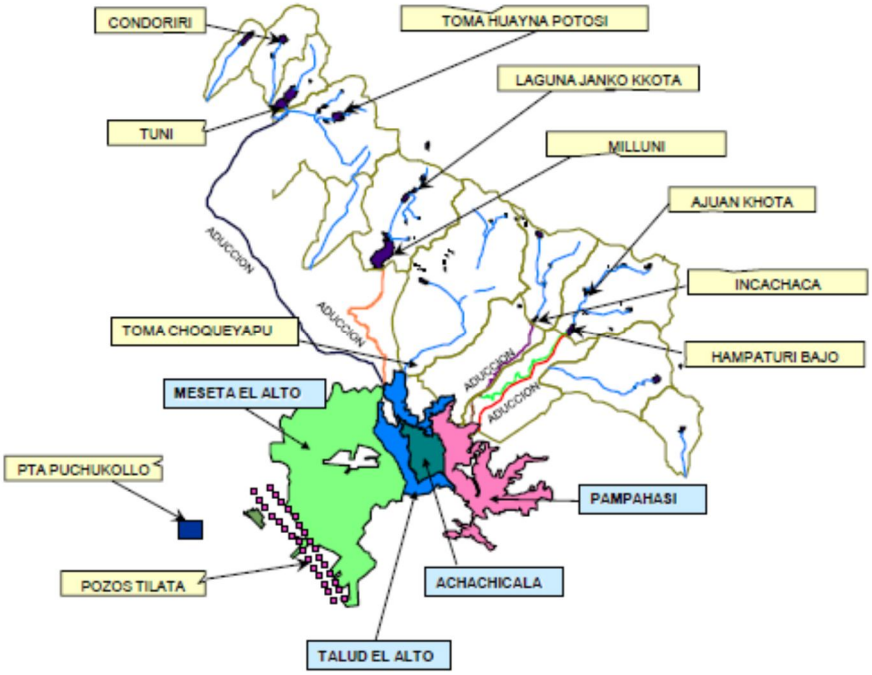
Current sources of water supply[11]for the metropolitan water system of La Paz and El Alto originate from rain, ice and groundwater. The water contribution of each to the urban supply system varies annually according to the inherent seasonality of each source, often complementing each other. Thus, in some micro-basins, glacier water melting becomes an important source during the dry season. This complementarity between the available sources of

[10]Regulatory plan of El Alto, 2000

[11]The water supply systems of the cities of La Paz and El Alto are fed from the following sources of water: Tuni-Condoriri, Tilata groundwater wells, Milluni, Incachaca and Hampaturi.

water makes these systems individually and collectively vulnerable to climate change. Figure 16 shows a diagram of the current system and its water sources for La Paz and El Alto.

Figure 16: System and water sources for La Paz-El Alto



Research on climate change in the tropical Andes (Wagnon et al. 2001), on the melting of glaciers (Ramirez et al. 2001), and the hydrology of the valley of La Paz (Ramirez et al. 2007), thoroughly describe the possible climate change impacts on the water resources of La Paz and El Alto and, therefore, water availability for domestic urban uses. According to a World Bank project(PRAA 2008), 80% of tropical glaciers in the Bolivian Andes are fast melting and some have already disappeared. It is estimated that the disappearance of glaciers that feed the Tuni-Condoriri system, one of the most important water sources for the metropolitan areas of La Paz and El Alto, would create a significant reduction in natural storage capacity and regulation of water resources in the period between 2025 and 2045.Another study also provides information related to the water balance (precipitation, consumption, water losses) in the water systems of La Paz and El Alto (Malter 2010).

Changes in precipitation patterns will also affect the final capacity of water systems to produce a reliable supply, or a consistent flow to meet the water demand of multiple users. In the highlands where water is diverted for La Paz and El Alto, a trend for rainfall to concentrate in the period from December to March has been reported, including heavy rainfall events, while the "dry" periods have stretched. This, with no statistically significant changes in annual precipitation observed at the weather stations (MMAyA).

Other climate trends show an increase in water evaporation and reduced soil moisture due to rising temperatures, increasingly erratic weather events, changes in precipitation patterns, increased frequency of extreme events, and more pronounced and frequent floods and droughts. These changes are not only generating a loss of water reserves in the glaciers and the

disruption of water supplies, but also reducing the effective capacity to store and regulate water in the reservoirs due to changes in the distribution of rains.

The general conclusion is that the water supply system for La Paz and El Alto is extremely vulnerable to the observed and projected changes in climate. It is therefore the objective of this Component to support the multiple actions/investments that the country has been developing regarding the water supply for La Paz and El Alto and thus ensure a resilient and reliable system. This will be achieved through the implementation of a program of interventions that include both increasing the supply and reducing demand. Some of these interventions include: (i) implementation of the Master Plan for water and sanitation in La Paz and El Alto for the next 20 years; (ii) enhancement to the hydro-climate observation network operating in the river basins servicing La Paz and El Alto (see description of Component 1 of this SPCR); (iii) several programs to reduce water losses; (iv) institutional strengthening of the operators; (v) zoning programs and management of water pressure; (vi) drainage programs for La Paz and El Alto; (vii) expansion of water services and sanitation for El Alto; and (viii) integrated river basin management, including other water uses such as irrigation, conservation of ecosystems (wetlands) and hydropower.

The PPCR resources will be strategically allocated to one investment, the *"Multipurpose water resources project for El Alto and La Paz"*, which will contribute to increase the resilience of the entire water supply systems of La Paz and El Alto. In this sense, the PPCR resources will represent about 21% of the projected water investment programs for the next 7 years in this area of great economic and social importance for the country.

Given the high vulnerability[12]of the water and sanitation system in La Paz and El Alto due to population growth (including migration from the country to the city), and the observed and anticipated effects of climate change on water resources, there is an urgent need to improve existing systems and develop new ones for the collection and distribution of water. Through its implementation, the"*Multipurpose water resources project for El Alto and La Paz"* will seek to increase the resilience of the water supply system of La Paz and El Alto. Program beneficiaries include rural communities living in the selected river basin areas and the inhabitants of La Paz and El Alto.

B. Preparation, general purpose and specific objectives of the investment project

The overall objective of the Program is to increase the resilience of the entire water supply system of La Paz and El Alto. The specific objectives are: (i) to guarantee the continuity and the quality of the water system in the metropolitan areas of La Paz and El Alto; (ii) to allow the expansion of coverage; (iii) to generate experiences and lessons to integrate climate change in the planning, design and implementation of water projects in the high mountain; (iv) to start the preparation and implementation of a pilot project of an IRBM plan that is multipurpose, participatory, sustainable, resilient and includes the gender dimension; and (v) lay the groundwork to have a climate resilient water system for the metropolitan areas of La Paz and El Alto.

[12]The vulnerability of water supplies for La Paz and El Alto has been referenced in the past by several authors including Ramirez and Olmos (2007).

C. *Key indicators and benchmarks*

Key project indicators are related to: (i) the reliability and/or resilience of the water and sanitation system as a whole; (ii) the performance of the strategic investment project in meeting its objectives; and (iii) the contribution to the knowledge of how to integrate climate resilience considerations in planning. The identified indicators are:

Performance indicators of the water supply system (results of the Program)

- Increased climate resilience of the system expressed in water availability against the demand in no less than 15% for the next 10 years from the beginning of the project.
- Increased ability to regulate flows, measured by the capacity of reservoirs (in million cubic meters, Mcm).
- Reduction of 10% in the rate of unaccounted for water.

Performance indicators of the investment project

- Increased availability of water, measured in additional million cubic meters per year (Mcm).
- Increased water storage capacity in million cubic meters (Mcm).

Indicators of climate resilience mainstreaming into planning and investment decisions in the water sector

- Increased consideration of climate resilience in investment processes, expressed through an increase in the number of projects or programs that include actions within their components that lead to a reduction of their climate vulnerability by the year 2020 using as a base reference the years 2007 to 2011.
- Increased consideration of climate resilience in the planning processes in the water sector as measured by the number of codes and standards proposed by the year 2020, using as reference the years 2007 to 2011.

Overall program performance indicators

- Number of beneficiaries (disaggregated by gender, household and vulnerability groups).
- Number of beneficiaries moving from intermittent water service to continuous water provision (disaggregated by gender, household and vulnerability groups).
- Number of beneficiaries with improved provision of wastewater disposal services (disaggregated by gender, household and vulnerability groups).

D. *Sub-components and planned activities, including learning and knowledge management activities*

The "*Multipurpose water resources project for El Alto and La Paz"* has been divided into the following Sub-components (Total estimated cost: US$ 68 million – PPCR Phase II US$44.5 million, local contribution US$ 14 million, other contributions US$ 9.5 million).

Sub-component 1: Increased water supply to El Alto and La Paz
(Total estimated cost: US$ 46 million)

Supplying water to the cities of La Paz and El Alto presents significant technical challenges. The population is growing at very high rates (in the case of El Alto, 3.5% per year, which means the population would double in around 20 years) and the area is located at 4,200 meters above sea level. This location makes it difficult to identify new and reliable sources with abundant water, at reasonable costs. However, the Government of Bolivia, through its MMAyA and EPSAS, has managed to meet the demand for water and has plans and investments to ensure supply until about 2018.A master plan for the long-term provision of water is in its early stages of implementation and expected to yield results distributed over the next three decades until 2040.

As explained above, the existing system (of water supply for the metropolitan area) is being impacted by climate change, reducing the reliable flow that can be obtained from existing infrastructure. The system is losing reliability or, in other words, the likelihood of being unable to meet the needs of the population is increasing. This Sub-component seeks to increase the availability of reliable water for La Paz and El Alto, offsetting the negative impacts of climate change and increasing the volumes available for a growing population.

The planned projects include smaller dams, structures for water control and diversion, pipelines, treatment plants and delivery structures to the drinking water distribution system, which is being expanded today. Additionally, the project includes addressing the needs of water use in the catchment sub-basin, improvements in the efficiency and reliability of these activities, protection and conservation of ecosystems, and attention to highly vulnerable population to changes generated by the project, such as women, youth, children and seniors. The latter will be achieved through the formulation of a participatory and inclusive IRBM plan, using international best practices, addressing the environmental and social needs of the community, and the legal and institutional requirements defined by the government of the Plurinational State of Bolivia.

Sub-component 2: Implementation of an integral river basin management (IRBM) program that includes protection and conservation of ecosystems and water provisioning for multiple uses
(Total cost: US$ 17 million)

The activities under this Sub-component will formulate a land use and natural resources planning multi-objective approach in a basin supplying water for La Paz and El Alto. The Plan will aim at improving living standards of the population in the basin, enhancing the availability of a climate resilient water supply, as well as preserving the production of ecosystem services. It specifically includes the following activities:

i. Development of an IRBM Plan, following a participatory and inclusive processes with the population located in the basin, water users (both inside and outside the river basin) such as those located downstream of the main consumer sites. The selected approach will be comprehensive, territorial and multi-sectoral, with special attention to the gender dimension (with the understanding that women in the region play a pivotal role in the management and protection of the micro-basins (see Annex 4).

The IRBM Plan includes, among others, the following: delimitation of economic zones, mapping and characterization of high-value ecosystems (biophysical, biodiversity, aesthetic), definition of critical areas requiring conservation treatment(preservation, protection, reforestation, erosion reduction, infiltration increase operations – aquifer recharge areas, buffer zones for extreme flows, etc.)and, as key output, the definition by the community, with the participation of key stakeholders, of the agreed land zoning specifying the environmental, social and/or economic activities that will be promoted in each area.

ii. Activities to improve the quality of life of the main economic groups in the basin through measures to modernize production practices. In particular, irrigation and drainage to increase the resilience of agricultural production to climate change (a goal of 3600 has that already exist with traditional irrigation, has been established in the Huarina Irrigation District in the Taypichaca basin).

iii. Documentation and critical assessment of the participatory social process followed for the preparation of the IRBM Plan and monitoring and evaluation of the accomplishments achieved in productivity and income.

Sub-component 3: Social program for the protection of vulnerable groups affected by the "Multipurpose water resources project" and for populations affected by climate change in the intervention area (Total cost: US$ 1.5 million)

Based on the studies and social analysis undertaken during the design stage of the Investment Project for El Alto and La Paz, the population affected by the planned works will be identified and the vulnerable population will be profiled. Social mitigation activities will consider vulnerability differentiated by gender, giving priority to those most vulnerable, including considerations of climate change.

In addition to the compensation and assistance programs to be agreed for the inhabitants of the basin who will be directly affected (in no case will they be harmed and the Program will increase their wellbeing), a special program will be designed to protect and benefit the most vulnerable, particularly women, children, the elderly and the disabled. This program will be designed in parallel with the infrastructure projects and will have an early start to protect this population, reduce possible social tensions and facilitate the rapid execution of the works.

Sub-component 4: Strengthening of capacities to use climate change information in planning (Estimated total cost: US$ 1 million)

This Sub-component aims to collect the experiences in the interpretation and use of data and information on climate change, as a central element to the planning and design of programs and projects resilient to climate change. To achieve this, the following actions will be implemented: (i) identify opportunities where information about climate scenarios is used for the planning and design of programs and projects; (ii) identify, catalog and analyze the variables used, as well as the interpretation and analysis procedures used to select the aspects of interest in each case; (iii) collect the perceptions of specialists about the information used, the identified gaps, the methodologies utilized, and the recommendations and suggestions to be incorporated in future technical applications. This information will improve approaches and methodologies to incorporate climate resilience in planning of programs and design of projects; and finally, (iv)

develop educational and dissemination materials of lessons learned, including technical and scientific publications.

Sub-component 5: Monitoring and evaluation (Total estimated cost: US$ 1 million)

This Sub-component includes activities for the elaboration of the baseline, learning and knowledge management among others. This subcomponent will be linked to the PPCR national component in order to facilitate the dissemination of lessons learned from the implementation of adapting pilot projects at the local level, to the national level.

Sub-component 6: Implementation of the project (Estimated cost: US$ 1.5 million)

A project implementation unit will be created exclusively dedicated to the management of this component and to the efficient use of resources allocated to this component. During the project formulation stage, a detailed project management structure will be defined.

E. Preliminary allocation (PPCR) and co-financing (including counterparts funds)

Table I. Multipurpose water resource project for El Alto and La Paz

Project components	Cost of investment project (in US$ million)			
	PPCR	National	Sub-national (municipal)	Total
Increased water supply to El Alto and La Paz (total estimated cost)	30	2.12	13.88	46
Implementation of an IRBM program that includes protection and conservation of ecosystems and water provisioning for multiple uses	10	7	0.0	17
Social program for the protection of vulnerable groups affected by the"*Multipurpose water resources project*" and for populations affected by climate change in the intervention area	1.5	0.0	0.0	1.5
Strengthening of capacities to use climate change information in planning	1.0	0.0	0.0	1.0
Monitoring and evaluation	0.9	0.0	0.1	1.0
Implementation of the project	1.1	0.38	0.02	1.5
Total	**44.5**	**9.5**	**14**	**68**

Table II. Climate resilience program for the water and sanitation systems of the metropolitan areas of El Alto and La Paz

Preliminary theoretical assignments and co-financing	Multipurpose water resources project for El Alto and La Paz (in million US$)	Climate resilience program for the water and sanitation systems of the metropolitan areas of La Paz and El Alto (in million US$)
Estimated total investment	68	206
PPCR contribution	44.5	

Municipal government counterpart	14	
Funding required from other sources	9.5	34.7
Other investment projects in the water and sanitation sector for the La Paz-El Alto system under implementation		103.3

Additional notes:

- A detailed study of alternatives to build resilience into the water supply system for La Paz and El Alto is in progress, thus the exact amount for the investment has not yet been determined. However, an approximate range has been defined. For planning purposes, the high end of the range has been used, as shown in the table above. The total estimated investment would be around US$ 56-68 million for the multipurpose project in El Alto, and includes a tentative contribution of US$ 44.5 million from the Phase II of the PPCR, of which approximately US$ 2.0 million will be used for the final design of the Investment Project. The total cost of the Project includes a provision of about US$ 250,000 for the identification study (IS) of options for the Investment Project.
- It is estimated that the counterpart from the Plurinational State of Bolivia could be in the order of US$23.5 million (approximately US$14 million from sub-national counterparts and US$ 9.5 from the national government), including about US$ 0.5 million for legal restructuring from the municipal government.
- An additional funding of approximately US$34.7million for the whole Program is contemplated for the scenario of US$ 44.5 million from the Phase II of the PPCR.

F. Institutional mechanisms

The Vice Ministry of Water and Sanitation (VASB, by its Spanish acronym) will be responsible for implementing, monitoring and the daily activities of the Investment Project, in close coordination with the Social Public Company for Water and Sanitation (EPSAS), as well as the Vice Ministry of Water Resources and Irrigation (VRHR, by its Spanish acronym).In addition to the mechanisms established in the sector through VASB, EPSAS and VRHR, a dialogue will be established with the key stakeholders: the water users (the people of El Alto and La Paz), the utility company, the municipalities involved and the communities in the selected river basin area for the Project.

G. Risks

The main identified risks are:

- Potential social tensions as results of conflicting and contradictory social demands among populations of the cities of El Alto and La Paz, the metropolitan municipalities and the communities in the selected river basin for the Project. For example, some of the potential areas of intervention have an irrigation system. The risk is that communities that

use the irrigation system will not agree with using part of the water for urban supply, even though the Project includes efficiency improvement of their system to compensate water diversion for urban use.

The lack of an effective mechanism for consultation can delay or paralyze the investments and exacerbate social tensions. This risk will be mitigated through effective processes of consultation and decision making based on good levels of information, as well as compensation and regulatory processes that can sustain over time the effective and equitable management of the river basin and the water resources, according to the social safeguards of the Inter-American Development Bank.

- An additional risk is the current institutional weakness of EPSAS. This weakness may affect the project, both during implementation and during operation of the system. During the execution, the risk will be mitigated through the creation of a project-coordinating unit, especially designed to provide proper management during construction. EPSAS will provide technical support and coordination with other activities under execution in the area of interest.

  To minimize institutional weakness risks during the operation stage, activities aimed at strengthening, consolidating and clarifying EPSAS corporate nature and independence will be executed. Also, the relationship of EPSAS with the participating municipalities will be strengthen to facilitate the investment process. EPSAS income will be reviewed to verify that it properly covers operating, maintenance and replacement cost.

- Finally, the environmental liabilities of both the mining activity in the river basin headwaters and the water and sanitation system (sewage) must be considered as an environmental hazard. These will be studied in the Master Plan for water and sanitation in La Paz and El Alto and will be managed as an integral part of the system. Environmental studies as well as prioritized remediation activities necessary to prevent environmental risks in the metropolitan area's drinking water supply system, will be executed.

H. Results framework and performance

The specific results of this Component are:

- An increased resilience of the water system in La Paz and El Alto in response to the observed trends and climate change scenarios (glacier retreat + seasonal variation in the hydrological cycle).
- A significant number of proved and successful adaptation measures piloted in the IRBM Plan that will enable the scaling of specific investments.
- Improved management of climate and water information allowing for mainstreaming climate considerations into planning process, consultations and decision making.
- Integrated river basin management plans have been implemented.
- Lessons learned about incorporating climate change in planning, design, investment operation and coordination work with the stakeholders have been systematized and disseminated.

12. Component 3. Strengthening resilience to climate change in the Rio Grande basin

A. Background and rationale

The Rio Grande basin was selected for its socio-economic importance (particularly for food security and agricultural exports) and the expected negative impacts (which are already being felt) due to climate change.

The Rio Grande basin concentrates 30% of the national population in an area of about 100,000 km^2(10% of the national territory). It includes two of the nation's largest cities: Cochabamba at the upper basin, with about 1.5 million inhabitants (INE 2001) and Santa Cruz, with about 1.1 million inhabitants (INE2001) at the lower basin. This river basin holds a wide biodiversity and important protected areas (see Annex 5).

The main expected impacts of climate change on the Rio Grande basin are an accentuation of: (i) the risks of drought and water shortages, especially in the upper basin, and (ii) the frequency and severity of floods, mainly in the lower basin.

The word accentuation is important because the risks of water scarcity, droughts and floods are also increasing for other reasons: (i) the deforestation and degradation of wetlands have produced a decrease in infiltration, resulting in an increased intensity of runoff in the rainy season and a decrease in groundwater recharge and river flows in the dry season; (ii) deforestation and bad agricultural practices cause soil degradation and erosion which in turns lead to sedimentation and flooding in the plains of the lower basin; and (iii) the increase of water demand due to population growth and economic activities.

The impacts of floods, droughts and shortages are also important because of the improper use of the land(e.g. floodplain settlements, deforestation for agricultural production in areas of steep slopes and heavy rain, etc.).

The recurrent droughts already cause significant agricultural losses, with effects on food security, agricultural exports and poverty. The increment in shortages and drought is accompanied by increasing conflicts overwater use. The floods, in addition to their impacts on agricultural production in the lower basin, are very expensive because of their damage to infrastructure (especially roads and bridges) and human settlements. The maps in Annex 5show the areas at risk from drought and flooding in the Rio Grande basin.

Considering the large size of the river basin, 2 of its 10 sub-basins have been prioritized: the sub-basin of the Mizque River in the upper Rio Grande and the sub-basin or Piraí River in the lower basin. The criteria that were used for selecting the sub-basins were:

i. Their representativeness and potential for replication in other sub-basins or river basins in the country. The three pilot sub-basins included in the Investment Program have been chosen to span the three main eco-regions in Bolivia (highlands, valleys and lowlands) and cover the three main climate change challenges (droughts, floods and increasing water scarcity). They will generate lessons on how to adapt to climate change in different settings. It is hoped that these lessons learned can be replicated in the rest of the country.

ii. Their readiness, because they already have an organization that can take over the management of the sub-basin: SEARPI in the Piraí River sub-basin and the Commonwealth of the Southern Cone in the Mizque River sub-basin.

The sub-basin of the Mizque River

The Mizque River sub-basin covers about 10,400 $km^2$and is representative of the central valleys of the country, subject to frequent water shortages. It is a basin with a high poverty rate and a largely rural population, mainly engaged in subsistence agricultural and livestock production. The relatively high rural density levels accompany the high pressure on natural resources, soil, forage areas, wood for use as firewood and water. Climate change constitutes an additional challenge to rural livelihoods in the basin. The inhabitants of the area, for example, describe a shortening of the rainy season in the last 2 decades, an increased frequency and intensity of droughts(PNCC 2002), and the need to change farming practices and increase the area of irrigation to respond to these changes.

The choice of the sub-basin of the Mizque River is supported by an assessment of water resources in the basin and the existence of the Integral River basin Management (IRBM)Plan for the Mizque River released in 2005[13], which includes a portfolio of irrigation and river basin projects. However, this IRBM plan only considers structural investments and does not account for the expected effects of climate change, or at least the additional uncertainties related to climate change.

The irrigation portfolio of the IRBM Plan for the Mizque River, includes 74projects with a total cost of US$ 86 million. Of these, US$ 26 million are earmarked for river basin protection and soil conservation of 34,000 ha (of the total 215,000 ha) which together produce about 5 million $m^3$of sediment per year (Universidad Mayor de San Simon 2004).This amount corresponds to about 9% of the total usable volume of the reservoirs in the area, making it imperative for the viability of investments in dams, to work on complementary measures contemplated in the IRBM in the upstream parts of the basin.

The Mizque River basin already has a commonwealth(*mancomunidad*)in charge of its management, including the municipalities that belong to the department of Cochabamba. The municipalities of the department of Santa Cruz have not organized yet to manage the basin, so in this case the management is done through SEARPI (see below).

The sub-basin of the Piraí River

The Piraí River sub-basin is located in the lower region of the Rio Grande basin. It has about 13,395 $km^2$and 1.5 million inhabitants. Because it is very well endowed with natural resources (water, soil, biodiversity),the Piraí sub-basin has largely sustained the regional development in the last 30-yearyears.Todayitgreatly contributes to the country's food security and the national agricultural exports. A quarter of the sub-basin's GDP comes from agricultural and livestock production, estimated at US$479 million or 5% of the national GDP in 2006.Economic activity in

[13]Various authors, 2005. IntegralRiver basinManagement Planof the Mizque River.

the high part of the sub-basin is minimal. It consists of small farmers engaged in subsistence production and growing of vegetables for the cities.

Flood risks have always been important in the sub-basin, and may be accompanied by changes in river flows caused by sediment and plant material overload, which is dragged because of the degradation of the river basin. The impacts of floods can be severe. This was the case in 1983,affecting the city of Santa Cruz, which had spread into the floodplain of the river, as well as the agriculture in the bottom of the basin. As a response, in 1983 the government of Santa Cruz created the Water Channeling and Regularization Service of the Piraí River (SEARPI, by its Spanish acronym) that is responsible for managing the river basin, although concentrating its efforts mainly on flood protection (e.g. infrastructure for defense, early warning systems).

Flooding and sedimentation in the Piraí River are accentuated by climate change (increased intensity and frequency of heavy precipitation) and the degradation of the upper and middle basin (deforestation and expansion of the agricultural frontier has resulted in decreased infiltration).Additionally, the agricultural frontier expansion and the settlement of new urban developments in the floodplain increasingly put more people, infrastructure and economic activities at risk. Furthermore, the intensive uncontrolled extraction of the Piraí River aggregates, used to sustain urban growth, weakens the edges of the river and may increase flood damage.

In 2001 a management plan for the Piraí River basin was prepared. However, this plan, already implemented at 70%, is outdated, does not have an integral management approach and has not taken climate change into account.

B. Component objectives

The main objective of this Component is to increase resilience to climate change in two pilot sub-basins of the Rio Grande basin: the sub-basin of the Mizque River in the upper basin and the sub-basin of the Piraí River in the lower basin. A second objective is to generate concrete experiences in planning, designing and implementation of integral investments that are resilient to climate change[14], whose results and lessons learned will be the basis for setting or adjusting national standards for public planning and investment, for possible replication in other regions and sectors.

Expected results of this component are:

- The resilience to climate change of production systems, ecosystems or prioritized settlements has increased in the two pilot sub-basins.

- Institutional arrangements are in place to enable the formulation and implementation of participatory, IRBM plans as well as the development and implementation of municipal and supra-municipal projects that incorporate the climate change dimension.

- Municipal autonomous governments (GAM, by their Spanish acronym) and the departments in the area of the intervention have the ability to use the mechanisms of

[14]Technical Mission PPCACC, July 11-15, 2011, La Paz.

basin planning, climate change scenarios and the information generated at the basin level for decision making.

- The guidelines for the preparation of pre-investment studies (*Estudio de Identificación*-EI or *Estudio Integral Técnico, Económico, Social y Ambiental* – TESA)[15] of irrigation and river basin management subprojects, as part of the National System for Public Investment, have been updated to incorporate the climate change dimension.

C. Indicators

- Number of beneficiaries, disaggregated by sex, with a farming system more resilient to climate change.
- Area and number of persons, disaggregated by sex, protected from flooding.
- Number of integrated and participatory river basin management plans that take into account the effects of climate change, formulated and adopted in the two pilot sub-basins of the Rio Grande and coordinated with the development plans of local governments.
- Information, monitoring and evaluation systems that generate data/knowledge about the effects of climate change and the management plans in the sub-basins, which are used by decision makers to manage those sub-basins.
- Number of created and/or strengthened water user organizations that have been trained to integrate basic aspects of sustainability in the water systems that they handle, as well as aspects of climate variability and change in their actions.
- The guidelines for the preparation of pre-investment studies (*Estudio de Identificación*-EI or *Estudio Integral Técnico, Económico, Social y Ambiental* – TESA)[16] of irrigation and river basin management sub-projects, as part of the National System for Public Investment, have been updated to incorporate the climate change dimension.
- Key river basin institutions (SEARPI, commonwealths and municipalities) using river basin plans and revised guidelines for pre-investment studies in irrigation and river basin management sub-projects to identify and prepare new investment projects.

D. Sub-components and activities

This Component includes 4 Sub-components:

Sub-component 1: Formulation/updating of participatory and integrated river basin management (IRBM) plan (Estimated cost: US$ 2.0 million)

To this day, there are plans in both sub-basins: the "Integral River Basin Management Plan for the Mizque River" prepared in 2004 with a focus on agricultural development and the "Integral River basin Management Plan for the Piraí River" prepared in 1991 and focused on flood

[15]The National System for Public Investment requires different types of pre-investment studies depending on the expected cost of the considered investment: for projects with a cost above 1 million bolivianos (or about US$ 150,000), a detailed investment study (TESA) should be carried out; otherwise, a simplified study (EI) is done.
[16]The National System for Public Investment requires different types of pre-investment studies depending on the expected cost of the investment considered: for projects with a cost superior a 1 million de bolivianos or about US$ 150,000, a detailed investment study should be carried out (TESA), otherwise a simplified study is done (EI).

protection. It is necessary to upgrade or develop new river basin plans, ensuring they are prepared in a participatory manner, that they are multi-sectoral, include both structural and non structural measures, and consider the possible effects of climate change on the sub-basin.

This Sub-component will finance the following activities:

i. Preparation of a methodological guide for participatory RBM planning that takes into account the climate change as well as environmental, social and economic dimensions. This guide will gradually improve as it is used during the Program.

ii. The formulation/upgrading of an integral and participatory plan for the management of each of the sub-basins including the dimension of climate change. The Project will support the updating of both plans with a multi-sectoral and climate change resilience approach. These plans will be prepared with the active participation of a representative group of stakeholders in the basin. The representative group will be identified as a result of a stakeholder analysis to be carried out in the initial phase of the Project, when the communication/participation strategy for each stakeholder group will also be defined. An important step in the plan will be the definition of the "status quo" or baseline.

Sub-component 2: Improving the information system of the sub-basins (Estimated cost: US$ 1.33 million)

Information systems are limited and do not ensure the generation of reliable data and information. In the Piraí River sub-basin, since 1983 there is a hydro-meteorological system managed by the SEARPI[17]for protection against floods. In the Mizque River sub-basin, there is specific information that has been generated by different initiatives but no information system has been created for river basin management. In addition to local initiatives, there is a national hydrological and meteorological service (SENAMHI) that operates the national hydro-meteorological information system (see Component 1).

This Sub-component will finance:

i. The development and operationalization of a river basin information system that allows sustainable river basin planning and management (including monitoring and evaluation of the river basin plan implementation and the effects of climate change), through the generation of its own data or establishing links with other local generators of information. The sustainability of the information system depends on a reliable source of funding for its operation and maintenance, which will be based on the sub-national institutions administering public funds. The system will include, among others, meteorological, hydrological, biophysical, environmental and socio-economic information. The Project will finance equipment, training, and operating and implementing expenses in a digressive manner.

[17]A decentralized autonomous entity of the government of Santa Cruz for the coordination and planning of social and economic development in the Piraí River basin.

ii. The training of personnel from entities interested in the management of river basin information, such as the association of municipalities and other public and private sector organizations.

Sub-component 3: Support to the implementation of structural and nonstructural measures to build resilience to climate change in the basin (Estimated cost: US$69.88 million)

Initially, the sub-component will finance prioritized measures in the existing plans that can help increase the resilience of the sub-basins. In a second instance, once the river basin plans are formulated and approved, the project will support the priority actions of the plans.

The project will finance pre-investment studies (including design), works, goods and services for the implementation of sub-projects, as well as the comprehensive technical assistance and supervision of the sub-projects. The beneficiaries will participate in the financing of structural measures and will ensure their operation and maintenance.

The range of measures eligible for funding from the Program will be defined during the project preparation. However, a preliminary proposal is:

In the sub-basin of the Mizque River, to concentrate efforts on two main issues due to their relevance in this area:

i. Improvement/modernization and expansion of irrigation to increase the resilience of agricultural production to climate change. These efforts would adopt a participatory and integrated approach that would include the following activities:

   - Improvement/upgrading or expansion of the irrigation infrastructure, increasing its efficiency. The objective of investments not having negative impacts on water availability in the basin and that are socially and economically feasible, will be ensured.
   - On-farm irrigation improvements.
   - Support for the establishment and strengthening of user organizations responsible for the operation and maintenance of the collective systems.
   - Support to production and commercialization.

ii. Protection of river basins to combat water scarcity, erosion, drought and floods. This Sub-component would adopt a participatory and integrated approach that would include the following activities:

   - Structural measures such as reforestation, construction of small/medium-sized reservoirs, measures for protection against erosion, etc.
   - Non-structural measures such as training of communities to improve land use, soil and water management, reforestation, establishment of protection zones, exchange of knowledge and experiences between communities, training of promoters, etc.

In the sub-basin of the Piraí River, to concentrate efforts on two main themes, namely:

i. Flood management, which contemplates the following activities:

- Strengthening the early warning system managed by SEARPI in coordination with the autonomous municipal governments.
- Zoning support.
- Infrastructure projects for riverbank protection.
- Capacity building of SEARPI and other key institutions and training of the potentially affected population.

ii. Coordinated management of groundwater and surface water to increase the resilience of the water supply for all uses of the sub-basin. The following activities are planned:

- Structural measures such as reforestation, soil management, protective measures against erosion, etc.
- Non-structural measures such as the training of communities to improve land use, reforestation, establishment of protection zones, exchange of knowledge and experiences between communities, training of promoters, compensation schemes for the protection of water sources, monitoring system of the groundwater aquifer of Santa Cruz, etc.

Sub-component 4: Institutional strengthening for implementation of Sub-component 3(Estimated cost: US$ 0.89 million)

This Sub-component would finance the following activities:

- The strengthening of SEARPI for the implementation of activities in the Piraí sub-basin.
- The strengthening of the Commonwealth of the Southern Cone so that its members can participate in the formulation and monitoring of the river basin plan.
- Creation and upkeep of local offices with technical, environmental and social capacities for the implementation of projects, including monitoring and evaluation.

E. Arrangements for project implementation

Arrangements for project implementation will be defined during the preparation phase of the Investment Program. For the time being, it is foreseen that the Project will be implemented through local offices in each of the sub-basins. When feasible, these offices will be established within existing organizations, such as SEARPI in the case of the Piraí sub-basin. These offices would be responsible for the technical aspects throughout the projects cycle, including management processes for procurement, evaluation, contracting, information management, safeguards, inter-interagency coordination, as well as monitoring and evaluation of the Project components. These offices will report to the Program Coordination Unit which will be responsible for monitoring and evaluating the Program and for the financial management.

F. Budget and financing

Cost (in US$ million)	PPCR	National	Sub-national and Users	Total
Formulation of integrated river basin management	2.00	0.00	0.00	2.00
Preparation of a methodological guide	0.20	0.00	0.00	0.20
Formulation/updating of the plans	1.80	0.00	0.00	1.80
Improvement of river basin information system	1.20	0.00	0.13	1.33
Development of information system + equipment	1.00	0.00	0.11	1.11
Training of SEARPI and Commonwealth	0.20	0.00	0.02	0.22
Sub-projects (structural and non-structural measures)	56.00	0.00	13.88	69.88
Mizque	28.00	0.00	6.94	34.69
Piraí	28.00	0.00	6.94	34.69
Institutional arrangements for formulation and execution	0.80	0.00	0.09	0.89
Total	**60.00**	**0.00**	**14.10**	**74.10**

G. Result indicators

Result	Indicators
Sub-component 1. There are plans for participatory IRBM projects, taking into account the effects of climate change, formulated and adopted in two pilot sub-basins of the Rio Grande, coordinated with the development plans of local governments.	• Number of participatory IRBM plans that take into account the effects of climate change, formulated and adopted in two pilot sub-basins of the Rio Grande, coordinated the with development plans of local governments.
Sub-component 2. There is a reliable system for the generation of knowledge related to specific climate change impacts at the basin level and for the monitoring and evaluation of the management plan implementation.	• Information, monitoring and evaluation systems that generate information/knowledge on the effects of climate change and the IRBM plans that are used by decision makers to manage them.
Sub-component 3.A group of pilot adaptation measures has been designed and implemented, reducing vulnerability to climate change of natural and human priority systems in the two pilot sub-basins of the Rio Grande basin.	• Number of created and/or strengthened water user organizations that have been trained to integrate basic aspects of sustainability in the water systems they manage, as well as climate change and variability in their actions, disaggregating trainees by gender. • Number of beneficiaries, disaggregated by sex, with a farming system that is more resilient to climate change. • Area and number of persons, by sex, protected against flooding. • The guidelines for the preparation of pre-investment studies (*Estudio de Identificación*-EI or *Estudio Integral Técnico, Económico, Social y Ambiental*-TESA)of irrigation and river basin management subprojects, as part of the National System for Public Investment, have been updated to incorporate the climate change dimension.
Sub-component 4. There are strengthened institutions (SEARPI and commonwealths) for the adaptation to climate change through river basin management in the two pilot basins.	• Key river basin institutions (SEARPI, commonwealths and municipalities) using river basin plans and revised guidelines for pre-investment studies in irrigation and river basin management sub-projects to identify and prepare new investment projects.

H. Risks

The risks related to the implementation of this component are:

- Formulation of participatory IRBM plans: the main risk is that the plans are formulated without considering climate change resilience, are not truly multi-sectoral, do not take into account the water requirements of ecosystems and/or do not follow a participatory process with all key stakeholders in the basin.
- Information systems: main risks are that:(a) the information systems do not remain sustainable once the project has been completed, (b) the information generated is not used for decision making, and (c) information generators do not share it to expand river basins information.
- Non-structural and structural measures: the main risk is that the sustainability of the actions is not ensured for lack of funds and/or appropriate design.
- Institutional strengthening for river basin management: main risks are(a) lack of commitment/interest of key stakeholders in the basin to participate in the IRBM, (b) lack of budget for the proper functioning of the institutions responsible for river basin management once the project is completed.

PART THREE

PILOT PROGRAM FOR CLIMATE RESILIENCE

Project / Grant Request Preparation Program[18]

1. Country/Region:	Plurinational State of Bolivia	**2.CIF Project ID#:**	(Trustee will assign ID)
3. Project Name:	Multipurpose water resources project for La Paz and El Alto		
4. Tentative Funding Request (US$ million in total) for Project[19] at the time of submission SPCR (concept stage):	*Loan: N / A*		*Grant: 44.5*
5. Grant Preparation Request (in US$ million):	*US$ 2.0*		*MDB: Inter-American Development Bank*
6. National Project Focal Point:	Minister Viviana Caro, Ministry of Development Planning (MPD, by its acronym in Spanish) Minister Julieta Monje, Ministry of Environment and Water (MMAyA, by its acronym in Spanish)		
7. National Implementing Agency (project/program):	Vice Minister Carlos Ortuño, Viceministy of Water Resources and Irrigation (VRHyR by its acronym in Spanish)		
8. MDB PPCR Focal Point and Project / Program Task Team Leader (TTL):	*Headquarters-PPCR Focal Point:* Mrs. Gloria Visconti Sr. Climate Change Specialist gloriav@iadb.org		*TTL:* *In the Bolivia country office:* Mr. Edgar Orellana edgaro@iadb.org *In IDB's HQ:* Mr. Alfred Grunwaldt alfredg@iadb.org

9. Description of Activities Covered by the grant preparation:

The Overall Objective of the *Multipurpose water resources project for La Paz and El Alto* is to increase the resilience of the water system for La Paz and El Alto to the effects of climate change by increasing the reliability of water production and environmental services provided by river basins. The specific objectives of the project are: i) ensure the continuity and quality of the water system in the metropolitan areas of La Paz and El Alto; ii) allow for the expansion of potable water coverage; iii) generate experiences and lessons learned to integrate climate change into the planning, design and implementation of water projects on high mountain areas; and iv) prepare and implement an integrated, multipurpose, participatory, sustainable and resilient river basin plan.

The preparation grant will be used to prepare detailed infrastructure designs for the project taking into consideration climate change impacts on the area's hydrology balance. It will be based on a first study of alternatives already in course. The group of specific activities that will be covered by the grant include:

- Comprehensive project engineering (includes all project components)
- Social assessments with emphasis on climate change impacts on gender issues

[18] A separate template needs to be presented for each project and program preparation grant request listed in the SPCR.
[19] Including the preparation grant request.

- Socio-economic assessment
- Financial assessment
- Environmental Impact Assessment as mandated by Bolivian legislation
- Climate change vulnerability and impact assessments on water sources for river basins serving La Paz and El Alto including required initial hydrological and/or climate modeling
- Definition of detailed project impact indicators and design of MRV structure
- Execution schedule
- Estimation of total Project cost based on detailed designs
- Base documentation to start procurement process (e.g. TORs, description of equipment to be used and type of consultant firms)
- Focus group discussions and stakeholder engagement initiatives to validate data, information, specific measures and plans of action

10. Outputs:

Deliverables	**Timeline**
(A) Validation workshops and stakeholders engagement activities	To be completed by December 2012
(B) Detailed climate resilient designs	To be completed by June 2013
…	

11. Budget (indicative):

Expenditures[20]	**Amount (US$) -**estimates
Consultants	1,550,0000
Equipment	180,000
Workshops/seminars	40,000
Travel/transportation	100,000
Others (admin costs/operational costs)	50,000
Contingencies (max. 10%)	85,000
Total Cost	**2,000,000**
Other Contributions:	
• Government	250,000
• MDB	
• Private Sector	
• Others (please specify)	

12. Timeframe(tentative)
Submission of pre-appraisal document for PPCR Sub-Committee Approval: August 2012
Expected Board/MDB Management[21]approval date: November 2012

13. Other Partners involved in project design and implementation[22]:
The Ministry of Environment and Water Resources, IDB, IBRD, and local governments

14. If applicable, explanation for why the grant is MDB executed:
The grant will be executed by the Ministry of Environment and Water Resources

15. Implementation Arrangements(including procurement of goods and services):
The proposed grant will be implemented through IDB but directly executed by the Ministry of

[20]These expenditure categories may be adjusted during project preparation according to emerging needs.
[21]In some cases,activities will not require MDB Board approval.
[22]Other local, national and international partners expected to be involved in design and implementation of the project.

Environment and Water Resources as stated above. Relevant NGOs, CBOs, local institutions and municipal governments will work in coordination with the executing agency to assure the inclusion of relevant stakeholders in the development of the activities proposed under this grant.

The procurement of goods and services will follow IDB's procurement guidelines and financial management standards.

PILOT PROGRAM FOR CLIMATE RESILIENCE

Project / Grant Request Preparation Program[23]

1. Country/Region:	Plurinational State of Bolivia	**2. CIF Project ID#:**	(Trustee will assign ID)
3. Project Name:	Incorporation of climate resilience into development processes and strengthening resilience to climate change in the Rio Grande basin		
4. Tentative Funding Request (in US$ million total) for Project[24] at the time of submission SPCR (concept stage):	*Loan: 60.0*	*Grant: 5.5*	
5. Grant Preparation Request (in US$ million):	*US$ 0.5*	*MDB: WB*	
6. National Project Focal Point:	Minister Viviana Caro, Ministry of Development Planning (MPD, by its acronym in Spanish) Minister Julieta Monje, Ministry of Environment and Water (MMAyA, by its acronym in Spanish)		
7. National Implementing Agency (project/program):	Vice Minister Carlos Ortuño, Viceministy of Water Resources and Irrigation (VRHyR by its acronym in Spanish)		
8. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	*Headquarters-PPCR Focal Point:* Mrs. Kanta Kumari, Lead Environment Specialist, kkumari@worldbank.org	*TTL: WB HQ:* Marie-Laure Lajaunie, Sr. Water Resources Specialist, mlajaunie@worldbank.org *Local WB focal point:* Maria Elena Soria, msoria@worldbank.org	

9. Description of activities covered by the grant preparation:

The preparation funding will allow for the preparation of Components 1 (incorporating climate change resilience in development processes) and 3 (building resilience to climate change in the Rio Grande basin) of the SPCR.

Preparation funds will enable the development of the following activities:

- Hydro-meteorological information system diagnosis at the national level and action plan (including budget) to strengthen it. This assessment will consider all the chain, starting with data collection and storage, quality control of data, information generation, and its use in decision making. It will identify the main constraints (technical, financial, human resources, etc.).
- Diagnosis of the warning system against floods in the basin of the Piraí River and proposed action plan to strengthen it (including budget).This assessment considers collection of data, data processing, generation of alerts and communicating messages to the population at risk.

[23] A separate template needs to be presented for each project and grant preparation request program listed in the SPCR.
[24] Including the preparation grant request.

- Rapid diagnosis of the PNCC and action plan to strengthen it (including budget).This assessment will consider the main functions of the PNCC and the technical, financial and human resources among others.
- Definition of the various components of the Project costs, monitoring indicators and arrangements for its implementation.
- Consolidation of detailed project costs, project financing and preparation of financial and economic analysis of the Project.
- Preparation of instruments for environmental and social safeguards triggered by the Project (social study, including analysis and mapping of stakeholders in the two pilot sub-basins for the development of integrated river basin management plans; environmental study; and socio-environmental framework) according to the national legislation and WB safeguards, including the women's perspective.
- Preparation of the Project's monitoring and evaluation system, including the definition of monitoring and evaluation indicators and the mechanisms for their collection, processing and dissemination.
- Base line study for the two sub-river basins.
- Preparation of the procurement and disbursements plan of the Project.
- Description and justification of the arrangements for the Project implementation.
- Preparation of the Operations Manual, including the implementation schedule.
- Preparation of the terms of reference for the river basin management plans.

10. Outputs:

Deliverables	**Timeline**
(A) Diagnosis of the information system	Ready by early March2012
(B) Diagnosis of the warning system	Ready by early March 2012
(C) Diagnosis of the PNCC	Ready by early March 2012
(D) Socio-environmental framework of the Program	Ready by the end of March2012
(E) Operations Manual: definition of the components, costs and financing, financial and economic analysis, monitoring and evaluation system, procurement and disbursements plan, arrangements for project implementation	Completed by early May2012

11. Budget (indicative):

Expenditures[25]	**Amount (US$) -**estimates
Consultants	400,000
Workshops / seminars	40,000
Travel / transportation	50,000
Contingencies (max. 10%)	10,000
Total Fees	**500,000**
Other contributors:	
• Government	
• MDB	

[25]These expenditure categories may be adjusted during project preparation according to emerging needs.

• Private Sector	
• Other (please specify)	

12. Timeframe(tentative)
Delivery of the project document (PAD) to the PPCR Sub-Committee: October 2012
Approval by the Board of the World Bank: December 2012

13. Other Partners involved in project design and implementation[26]:
PNCC, SENAMHI,SEARPI, IDB

14. If applicable, explanation for why the grant is MDB executed:
N/A

15. Implementation Arrangements(including procurement of goods and services):
The grant for the preparation of the project will be executed by the Ministry of Environment and Water Resources. A grant agreement will be signed between the World Bank and the Government. The World Bank rules will apply to procurement and financial management related to grant implementation.

[26]Other local, national and international partners expected to be involved in design and implementation of the project.

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EACC World Bank, 2010. *País piloto del Estudio Económico de la Adaptación al Cambio Climático, Estado Plurinacional de Bolivia*. World Bank.

ERECC Water IDB. Study financed by the IDB: *Cambio Climático en Bolivia hasta 2100: Análisis de los cambios en la demanda hídrica y el Índice de escasez a nivel provincial.*By: Nashira Calvo Cárdenas, with contributions from: Lykke Eg Andersen, Rubén Mamani, Miguel Ontiveros. La Paz. May 2010.

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ANNEXES

ANNEX 1: Results of the People's World Conference on Climate Change

PUNTOS CENTRALES DEL ACUERDO DE LOS PUEBLOS

Conferencia Mundial de los Pueblos sobre el Cambio Climático

Resultados de la Conferencia Mundial de los Pueblos sobre el Cambio Climático y los Derechos de la Madre Tierra realizada del 19 al 22 de abril de 2010 en Cochabamba, Bolivia.

1. La visión compartida es estabilizar las concentraciones de gases de efecto invernadero. Nuestra visión es, sobre la base del principio de las responsabilidades históricas comunes pero diferenciadas, exigir que los países desarrollados se comprometan con metas cuantificadas de reducción de emisiones que permitan retornar las concentraciones de gases de efecto invernadero en la atmósfera a 300 ppm y, así, limitar el incremento de la temperatura media global a un nivel máximo de 1°C. Debe comprender de manera integral y equilibrada un conjunto de medidas financieras, tecnológicas, de adaptación, de desarrollo de capacidades, de patrones de producción, consumo y otras esenciales como el reconocimiento de los derechos de la Madre Tierra para restablecer la armonía con la naturaleza.
2. En un sistema interdependiente del que los seres humanos somos uno de sus componentes, no es posible reconocer derechos solamente a la parte humana sin provocar un desequilibrio en todo el sistema. Para garantizar los derechos humanos y restablecer la armonía con la naturaleza es necesario reconocer y aplicar efectivamente los derechos de la Madre Tierra.
3.- Los países desarrollados, principales causantes del cambio climático, asumiendo su responsabilidad histórica y actual, deben reconocer y honrar su deuda climática en todas sus dimensiones, como base para una solución justa, efectiva y científica al cambio climático.
4.- Rechazamos de manera absoluta el ilegítimo "Entendimiento de Copenhague", que permite a los países desarrollados ofertar reducciones insuficientes de gases de efecto invernadero, basadas en compromisos voluntarios e individuales que violan la integridad ambiental de la Madre Tierra y conducen a un aumento en la temperatura global de alrededor de 4ºC.
5.- La próxima Conferencia sobre Cambio Climático, a realizarse a fines de año en México, debe aprobar la enmienda al Protocolo de Kyoto, para el segundo periodo de compromisos a iniciarse en 2013 a 2017, en el cual los países desarrollados deben comprometer reducciones domésticas significativas de al menos el 50 % respecto al año base de 1990, sin incluir mercados de carbono u otros sistemas de desviación que enmascaran el incumplimiento de las reducciones reales de emisiones de gases de efecto invernadero.
6.- Rechazamos los Tratados de Libre Comercio y Acuerdos de Asociación y toda forma de aplicación de los Derechos de Propiedad Intelectual sobre la vida, los paquetes tecnológicos actuales (agroquímicos, transgénicos) y aquellos que se ofrecen como falsas soluciones (agrocombustibles, geoingeniería, nanotecnología, tecnología Terminator y similares) que únicamente agudizarán la crisis actual.
7.- Exigimos reconocer el derecho de todos los pueblos, los seres vivos y la Madre Tierra a acceder y gozar del agua, y apoyamos la propuesta del gobierno de Bolivia para reconocer el agua como un Derecho Humano Fundamental.
8.- La Declaración de la ONU sobre los Derechos de los Pueblos Indígenas debe ser plenamente reconocida, implementada e integrada en las negociaciones de cambio climático.
9.- Los países desarrollados deben asumir la responsabilidad sobre los migrantes climáticos, acogiéndolos en sus territorios y reconociendo sus derechos fundamentales, a través de la firma de convenios internacionales que contemplen la definición de migrante climático para que todos los Estados acaten sus determinaciones.
10.- Demandamos la creación de un Tribunal Internacional de Justicia Climática y Ambiental que tenga la capacidad jurídica vinculante de prevenir, juzgar y sancionar a los Estados, las empresas y personas que por acción u omisión contaminen y provoquen el cambio climático.
11.- El proceso del Referéndum Mundial, plebiscito o consulta popular será fruto de un proceso de preparación que asegure el desarrollo exitoso del mismo.
12. Llamamos a construir un Movimiento Mundial de los Pueblos por la Madre Tierra que se basará en los principios de complementariedad y respeto a la diversidad de origen y visiones de sus integrantes, constituyéndose en un espacio amplio y democrático de coordinación y articulación de acciones a nivel mundial.

En adjunto del Acuerdo está el Plan de Acción Mundial y la Propuesta de Declaración Universal de los Derechos de la Madre Tierra.

El presidente del Estado Plurinacional, Evo Morales, expondrá con delegados de los cinco continentes estos puntos centrales en la sede de las Naciones Unidas de Nueva York el 7 de mayo de 2010. Para el 18 de mayo, Morales dijo que presidirá una misión intercontinental a Nueva York y que también se desplazará hasta la sede *pro tempore* de la Unión Europea, radicada actualmente en Madrid, donde entregará las conclusiones de la Primera Conferencia Mundial sobre el Cambio Climático.

ANNEX 2: Climatological Maps of Bolivia

FIGURE 1: Annual Average Temperature Patterns (Source: FAN Bolivia)

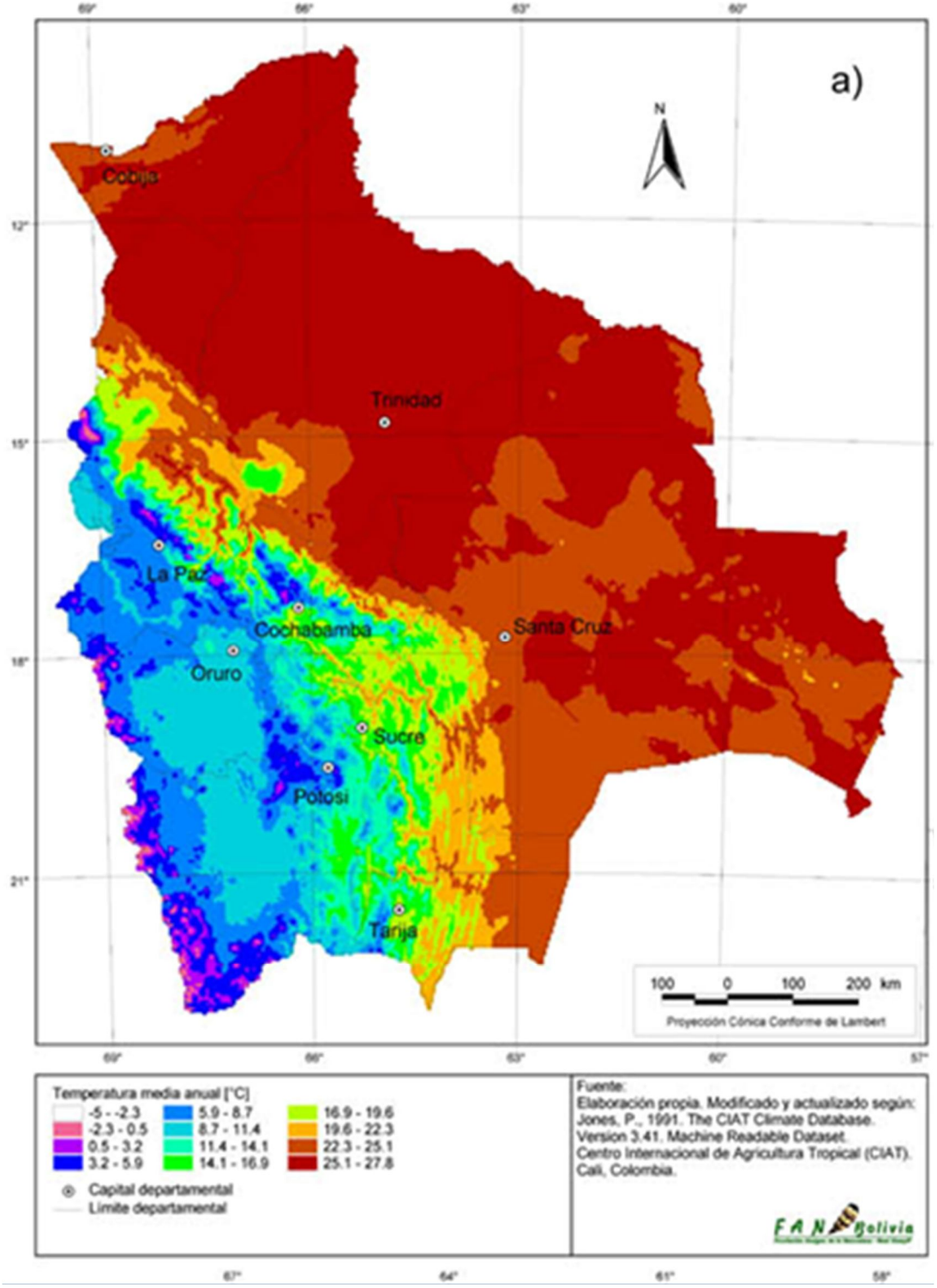


FIGURE 2: Annual Average Precipitation Patterns (Source: FAN Bolivia)

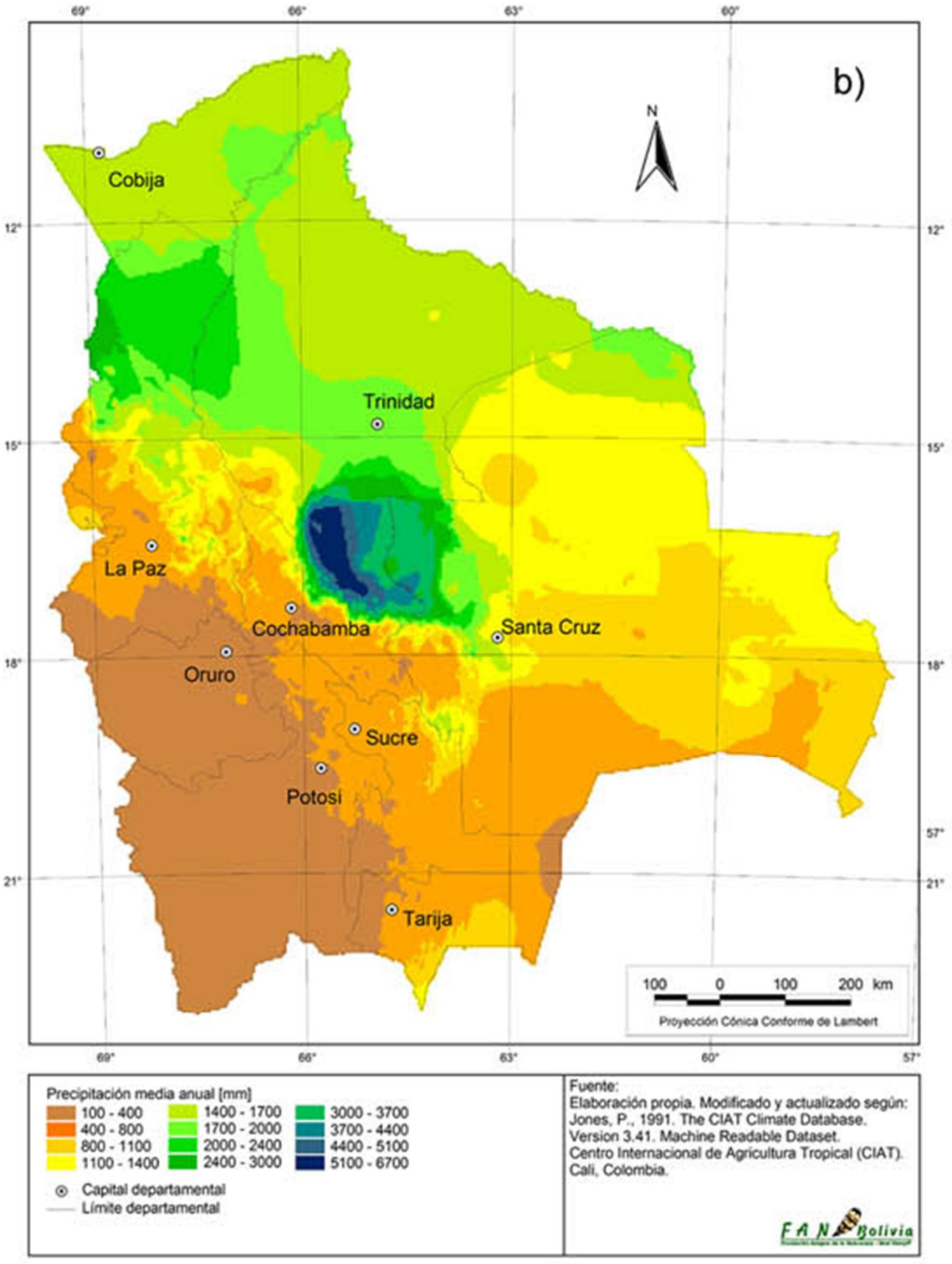


FIGURE 3: Thornthwaite Potential Evapotranspiration (Source: FAN Bolivia)

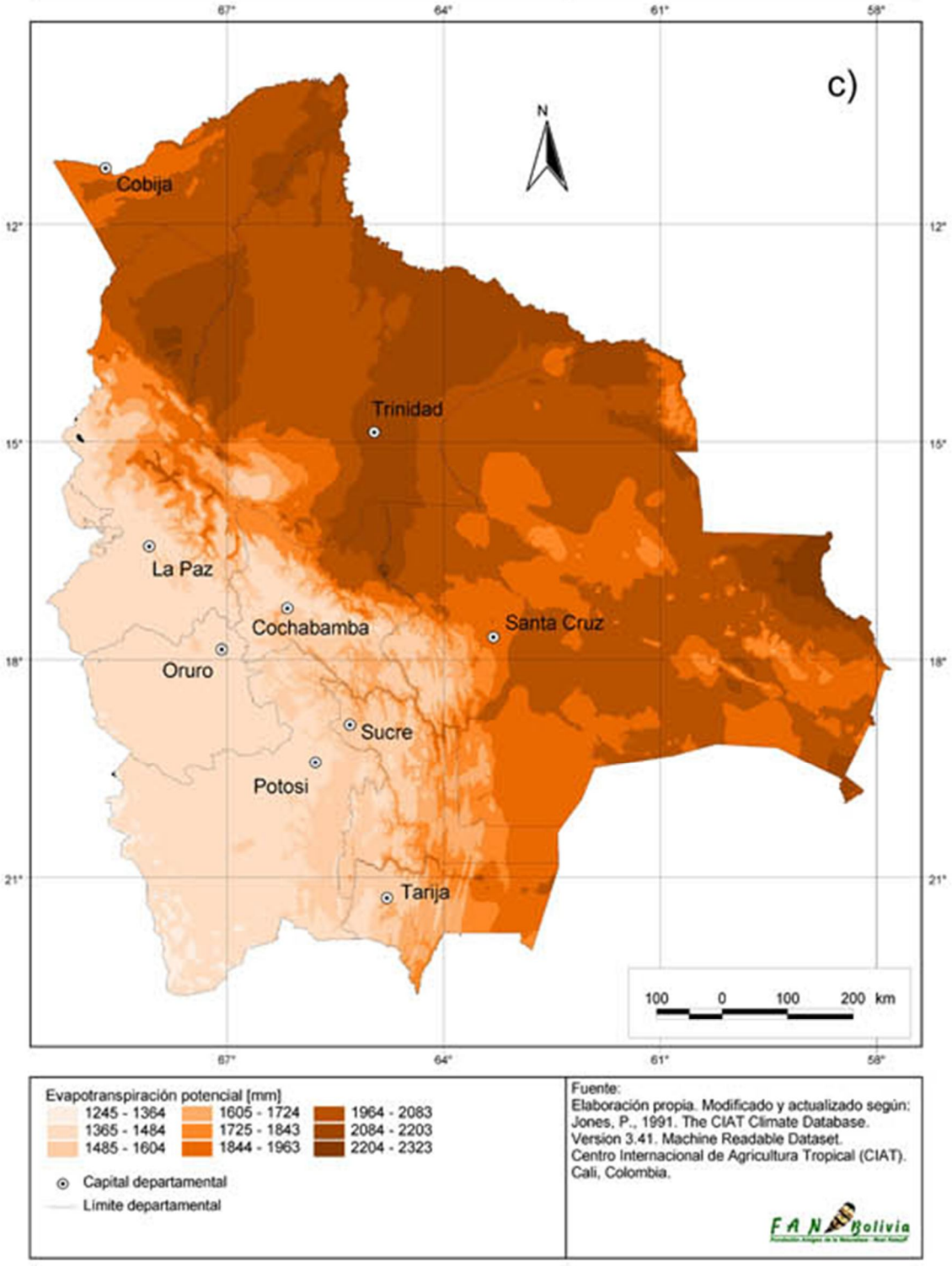
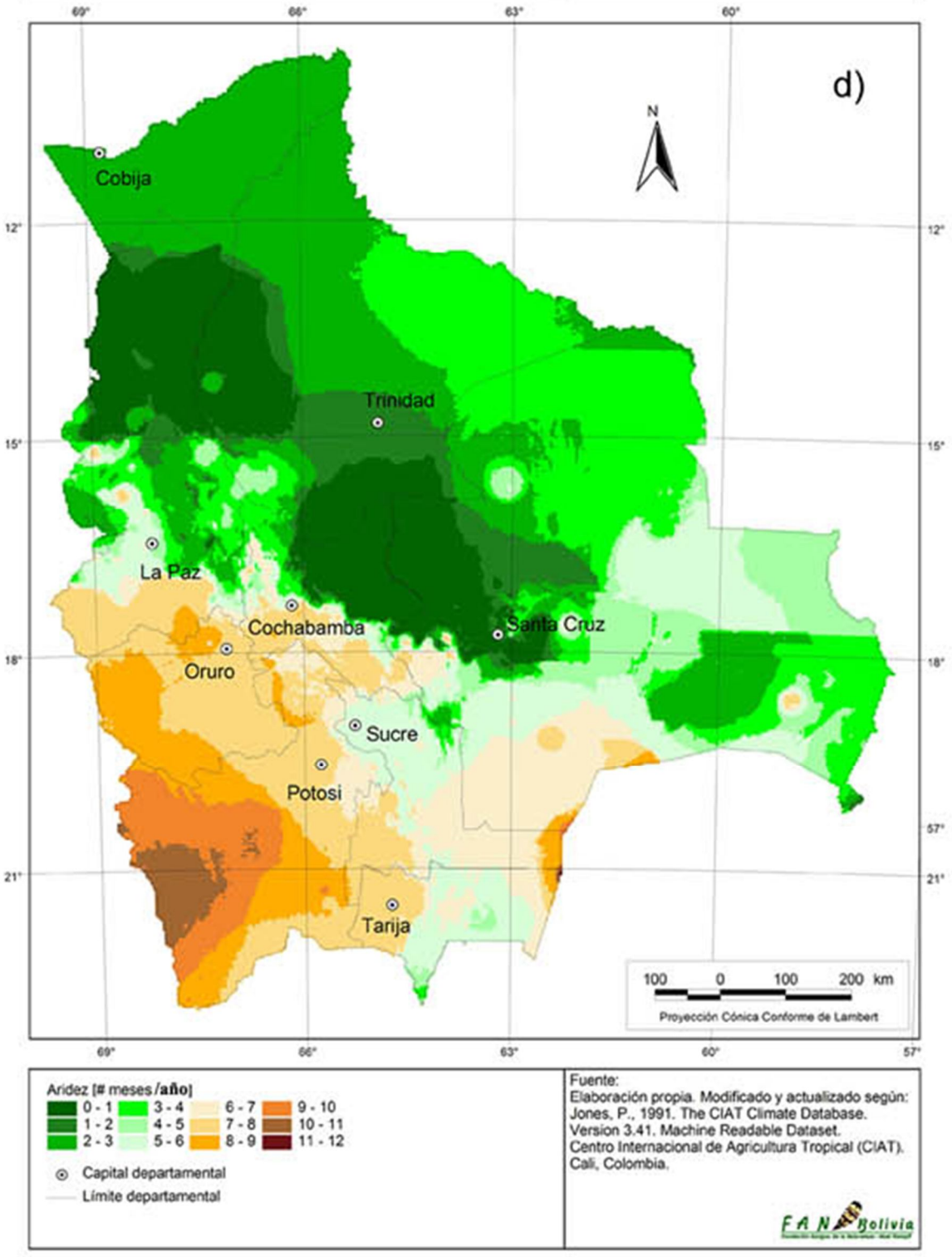


FIGURE 4: Isohygromens by Lauer (1952) (Source: FAN Bolivia)



ANNEX 3: Location of Climate Threats and Risks

Figure 1: Regions that get flooded (Source: Oxfam, FUNDEPCO)

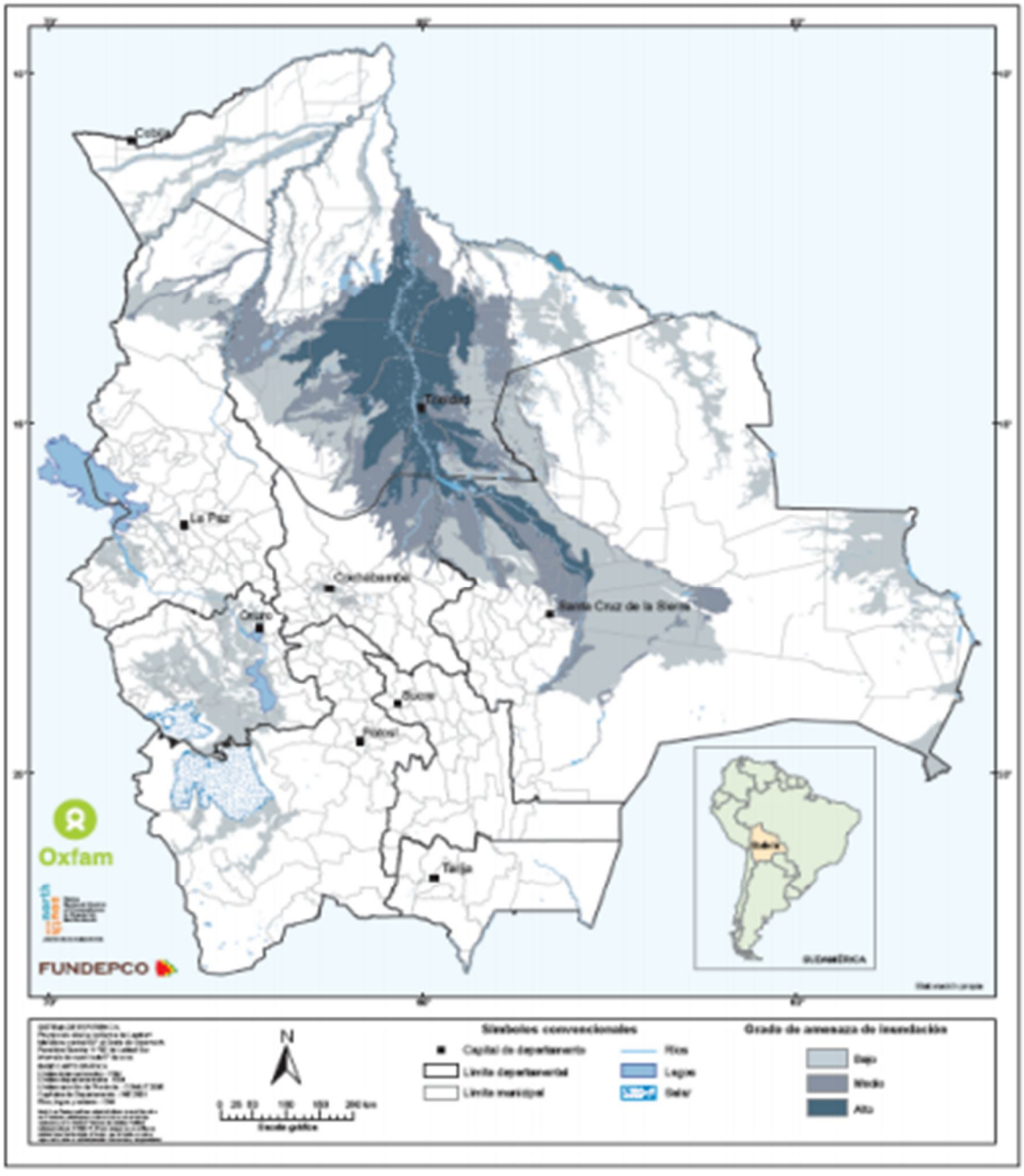
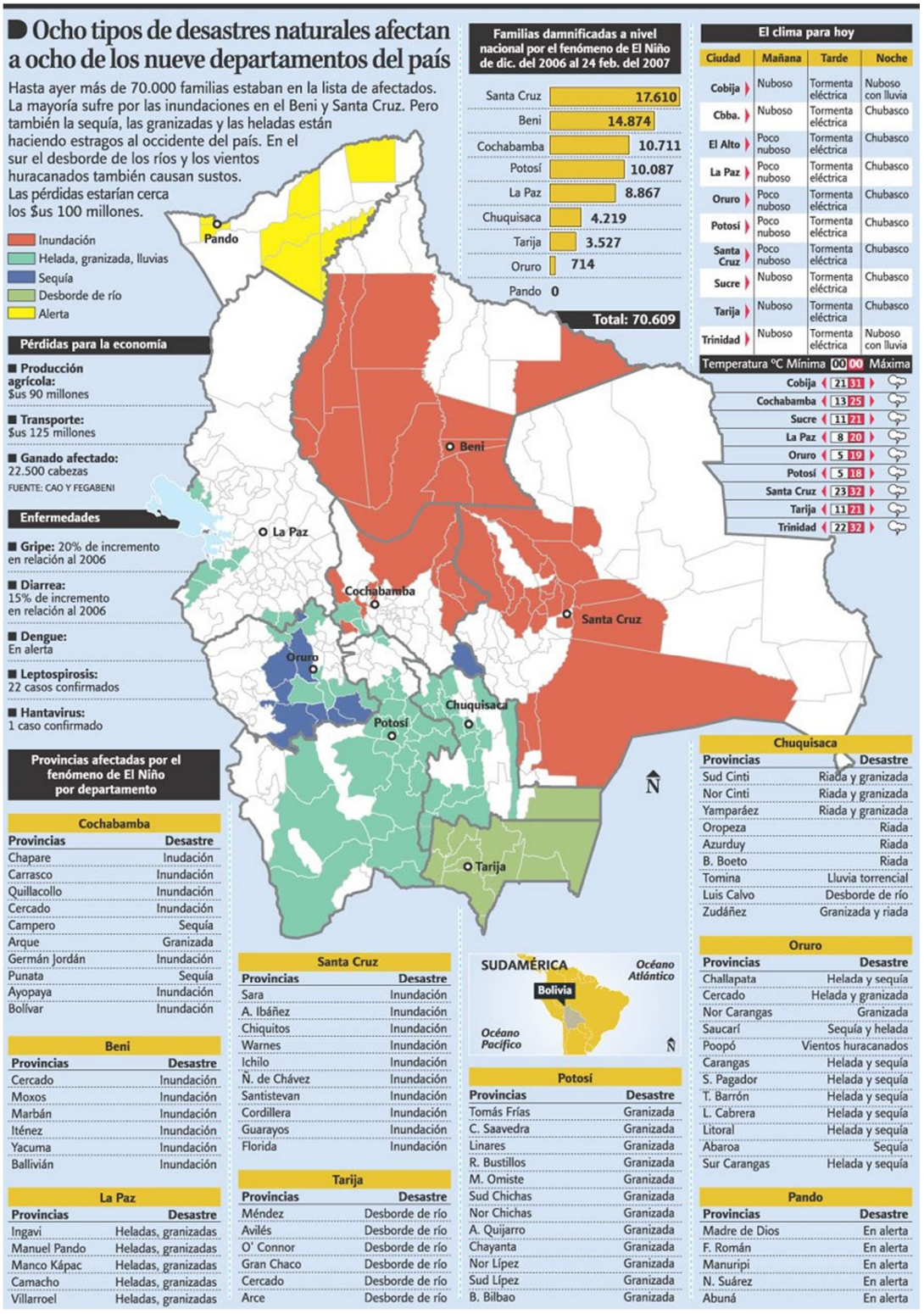


Figure 2: Concentration of climate-related disasters between December 2006 and February 2007 (Source: La Razón)



ANNEX 4: Gender Approach for the SPCR

1. Introduction

Climate change has differential impacts and responses between men and women(Otzelberger 2011). Therefore it is important to know the inequalities in access to and control of resources, level of dependence on environmental resources, rights and capabilities, and knowledge level of both groups. The vulnerability to climate change and natural disasters varies according to the level of exposure to them but also to the ability to cope with and to recover from extreme events, which in turn depends on the strategies, skills and resources that are available.

There is little specific research on women's particular vulnerability to climate change in the country. One of the few research studies related to the subject is one by CEPAL, which makes a quantitative analysis of the effects of *La Niña* in Bolivia in 2008 with a gender perspective(CEPAL 2008). Because of the many productive and reproductive activities of women, the impact has had a multiplier effect. For example, with the destruction of homes, the damage not only affected the "home", but also involved the destruction of the women's work area. During disasters, women are taking on many additional tasks, from the rescue of the wounded and caring for sick family to the work on land rehabilitation.

Climate change is accelerating the trend of male migration generating a new dynamic of the traditional roles of women and men. When weather events affect the harvest, temporary migration increases. A study of 14 different eco-regions showed that 36% of adaptation measures used by rural households are represented by temporary migration(Morales 2010). Studies of glaciers show that it is mainly men who temporarily migrate to seek alternative income sources (mining, transportation, construction), while the women remain as heads of household, changing the positions and roles they play within the family and the community[27].

As a result, the role of women in rural areas is growing and, in many regions, women should be considered as the main local stakeholder with a permanent presence in the community. For example, in the context of the First Summit of Women of the Provinces of La Paz, the importance of women who have increased their participation in the cycle of agricultural production was identified[28]. They participate in the planting, hoeing, watering, harvesting, herding of livestock and even commercialization. On one hand, in many cases, this change is economically empowering rural women and giving them access to community decision making. On the other hand, women have to assume traditionally male responsibilities without direct access to all financial (credit), technological and social resources. Moreover, women need to live in the countryside by themselves - facing climatic events like drought, frost and floods – and, at the same, care for their family(children and the elderly).This increases their vulnerability to climate change and, in many cases, inequality between women and men continues. One example is that men's income is always higher than women's.

Women should not be considered as a homogeneous group and or only as a vulnerable group. Consideration of gender inequality involves working *with men and women.* No man or woman is part of a homogenous group and, in a given context, they interact with social variables such as age, income or ethnicity (Otlzelberger 2011). Preliminary results of a World Bank study in Bolivia (due for completion in November 2011) shows that women of different ethnicities and regions are generally economically

[27]2011 CARE Study funded by the World Bank and an unfinished study by the World Bank.
[28]Within the framework of the First Summit of Women of the Provinces of La Paz, organized by the Vice Ministry of Rural Development and Agriculture, La Paz, July 2011.

dependent on men and their participation in community decision making is limited. However, at the family level and in informal institutions, women influence many decisions and control important natural resources. These informal arenas in which women participate should be deeply analyzed along with the inequality among women within their communities. For example, when men in the *Altiplano* migrate, women organize into "Aynis" (traditional form of the Aymara people) to support each other in their agricultural activities.

The investments of the Phase II of the PPCR are focused on two river basins in the country that represent three of the four macro eco-regions of the country, divided by rural and urban areas. This calls for a gender approach tailored to different socio-economic and cultural contexts. The different areas have strong and very different organizations. Work at the river and sub-basin level in different eco-regions, and a focus on both urban and rural areas, should be prioritized. In the process of incorporating gender issues to the SPCR investments and its various components, the difference in vulnerability and needs of women and men should be considered.

2. What does the government currently do in relation to gender issues and climate change?

Gender policies in Bolivia began in the early 80s, and strengthened since 1993 with the enactment of the Law for Popular Participation and the establishment of the Sub-secretary of Gender Affairs.

The State Constitution adopted in2009 established a number of relevant articles in favor of non-discrimination and women's rights, including rights to land and other productive resources. The Equal Opportunities Plan "Women Building the New Bolivia to Live Well" was also developed and approved in 2009, establishing six priority areas, which are the responsibility of all sectors and levels of government and whose vision is to achieve by 2020 equal opportunities for access to services, full participation in decision making and equitable distribution of resources[29].

Regarding the institutional framework, there are currently two state agencies related to the gender subject and policies: the Vice Ministry of Gender Equality (VIO, by its Spanish acronym) in the Ministry of Justice, and the Unit of "*Despatriarcalización*" dependent on the Vice Ministry of Decolonization which is part of the Ministry of Culture. These instances are considered weak, with limited capabilities to influence the country's strategic discussions beyond the social focus and the "traditional" priorities of health, education and violence.

Regarding progress in the inclusion of gender issues related to natural resources, water and climate change, there is some progress in the development of guidelines and manuals. In the Ministry of Environment and Water (MMAyA, by its Spanish acronym) several guides that incorporate the gender approach in specific projects in the field of water and sanitation, as well as irrigation projects, have been developed.

- *Vice Ministry of Basic Sanitation:* There is a guide on community development for water and sanitation projects for settlements with less than 10,000 inhabitants, DESCOM, which through community development activities, includes a gender perspective in the implementation of any proposed water and sanitation project, in a participatory process of institutional and community stakeholders.

- *Vice Ministry of Water Resources and Irrigation:* Several guides were developed and are currently being used in the implementation of major and minor irrigation projects with a gender perspective

[29]The axes of the Plan are: (i) violence based on gender, (ii) citizenship and political participation, (iii) institutional strengthening, (iv) economy, productivity and employment, (v) education and (vi) health.

throughout the whole project cycle from the diagnosis, design, construction and operation[30]. Also, at the river basin level, within the National River basins Plan(PNC, by its Spanish acronym), a proposal has been developed for the incorporation of gender in the implementation and development of IWRM and IRBM, including gender indicators in the projects. Currently, a gender indicator has been included in the performance evaluation matrix (MED, by its Spanish acronym). Other guides are being drafted for project prioritization and development, promotion and operationalization of OGCs, and formulation of master plans, all with a gender perspective. This is a breakthrough that will allow, beginning at the planning stages, the incorporation of gender-specific factors.

- *Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management:* The National Climate Change Program (PNCC) began addressing the gender issue in 2010 with an initial workshop on "Gender and Adaptation to Climate Change"[31]. Recently, in July 2011, it organized a new event, the 3rd Social Summit of Women to Tackle Climate Change, which sought to identify instances of dialogue to achieve a greater understanding of the impacts and effects of climate change from a gender perspective. Within the National Protected Areas Service (SERNAP, by its Spanish acronym) a gender strategy has been developed and is in the process of being implemented, bringing the gender perspective into the implementation of shared management in operational plans, productive projects and training programs.

It is important to note that, although there is progress in the incorporation of gender in climate change issues, there are major gaps and challenges. The existence of the guides and manuals does not guarantee their application or the real improvement of gender conditions in the different actual projects. It is important to monitor these processes to verify their applicability. Information, training and institution building will be essential to move forward with the strengthening of gender mainstreaming. The "Protection Board" with a strong gender focus, linked to risk management, is a good example of how institutionalization could be combined with concrete actions.

3. Challenges identified for incorporating gender in the projects cycle

As part of the SPCR implementation process, an inventory or "stocktaking" has been made of existing data and studies that are relevant to climate change adaptation in rural areas, and research has been made on the experiences of integrating gender in the preparation and implementation of projects by different donors in Bolivia. The findings are important for the development of a plan to transversely integrate gender in the preparation, implementation and evaluation of investments. The main conclusions of the "stocktaking" highlights that:

i. *Although a national policy framework conducive to the implementation of the gender approach already exists:* a) the rules are little known and rarely considered by the sectors and the international cooperation; b) there are limitations for developing a cross-cutting multi-sector gender approach in different sectors; c) the state institutions responsible for ensuring the implementation of gender policies are very weak and there is no clarity about responsibilities; d) in some sectors there is resistance to the approach.

[30]The program PROAGRO/GIZ has developed, based on pilot experiments, booklets for cross-cutting the gender approach in irrigation projects in several communities in Bolivia.In the AACC program - "Adaptation of agriculture and water use in agriculture to climate change in the Andes" by GTZ in the Andean Countries 2010-2013, the subjectrevolvesaround the prospects for gender in IWRM. The “Adaptation to Climate Change in the Andean Region”, addresses the incorporation of standards to institutionalize a gender perspective, including legislation, policies or programs.

[31]Workshop held in Cochabamba in March 2011.

ii. *Efforts to promote gender issues are heavily dependent on aid resources.* Although there is some progress in public institutions responsible for gender and the sectors prioritized in the SPCR, these advances are sporadic, resulting in few structural changes and limited impacts during implementation. Generally it is the international cooperation agencies who promote gender mainstreaming and, therefore gender activities depend mainly on international cooperation resources.

iii. *There is no disaggregated information on the impacts of natural disasters and climate change among men and women.* In this regard, the analyses and evaluations rarely disaggregate data by sex, which obscures gender differences and inequalities. Studies that have done so – e.g. on the impact of *La Niña*– show the importance of disaggregating information to make a differentiated assessment of the situation, effects, impacts, among others. There is a particular tendency to consider "the community" as a homogeneous unit of analysis.

iv. *Usually there is a disconnection when trying to incorporate gender in the project cycle.* In some projects there are efforts to incorporate the gender issue. However, while these projects show a strong gender perspective in the process of preparation (baseline studies and manuals), the integration of gender is much weaker during the implementation. In addition, there are difficulties and limitations to associate (and demonstrate) the results of gender with impacts on the conditions and the quality of life of women.

Based on the "stocktaking", it is clear that the incorporation of the gender approach requires a dedicated additional effort to overcome the barriers identified in previous experiences in Bolivia. This effort includes political will, additional resources, institutional capacity and that gender is explicitly incorporated into the results framework (indicators).

4. Integration of the gender dimension in SPCR investments

Based on the "stocktaking" and consultations with NGOs, cooperation agencies and potential beneficiaries, some aspects have been identified to be highlighted for the upcoming Program and the development of its components. These aspects are explained in this section.

Mainly it will be important to avoid a disconnect between the investments during the preparation process and then a lack of monitoring during implementation. This requires ongoing support and training of the implementing institutions of the projects. It is also important to have access to information and data disaggregated by sex, something that demands additional resources during the preparation and implementation of the project. A comprehensive strategy would be key to ensure gender mainstreaming in all phases of the implementation of the SPCR. The following list outlines various tools and strategies for incorporating gender in the different phases of the investments.

Preparation and Design Phase:

- Conduct a *Social assessment with a gender focus* in specific sectors and regions, which could be based on the World Bank's initial efforts in Bolivia. The study should identify differentiated vulnerabilities as well as differentiated demands and responses in different regions. The study should also highlight the differences between gender roles in different communities and within the communities themselves.

- Take into account the *Mitigation of potential negative impacts* from a gender perspective, such as avoiding that the burden of unpaid work for women indirectly increases with the projects, that women's access to water is not reduced or that the river basin protection programs do not reduce the women's access to natural resources.

- Develop a *Capacity building plan* to incorporate gender issues and to monitor and evaluate progress from a gender perspective.

- Establish *Gender indicators, goals and objectives* in the investment projects. During each project formulation, gender indicators should be clearly established. Additionally, an operational plan should be developed to designate the responsibilities to ensure gender monitoring.

Implementation Phase:

- *Identify institutions and units* responsible for the implementation and monitoring of gender indicators, as well as a results framework and definition of specific tasks.

- *Assign resources* specifically for *monitoring and evaluation* of gender initiatives and for the dissemination of best practices.

- *Identify ways to promote projects that include a gender approach* through specific actions such as contests, projects aimed at women, workshops to identify projects for women, and so on.

- Ensure that the *capacity building* of implementing agencies remains an *ongoing process* during execution and that resources are available for dissemination, additional studies and workshops.

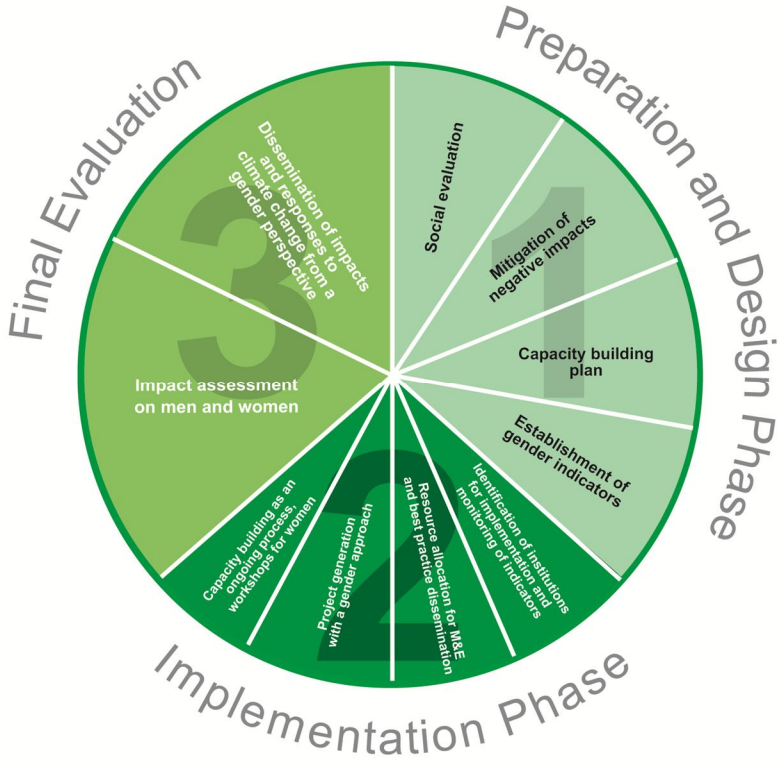
Final Evaluation:

- Conduct an *Assessment of project impacts* for both men and women

- Conduct the *Dissemination of impacts and responses* to climate change from a gender perspective..

All the elements described above can be seen in the following Figure:

GENDER INCORPORATION STRATEGY IN INVESTMENT PROJECTS OF THE PPCR



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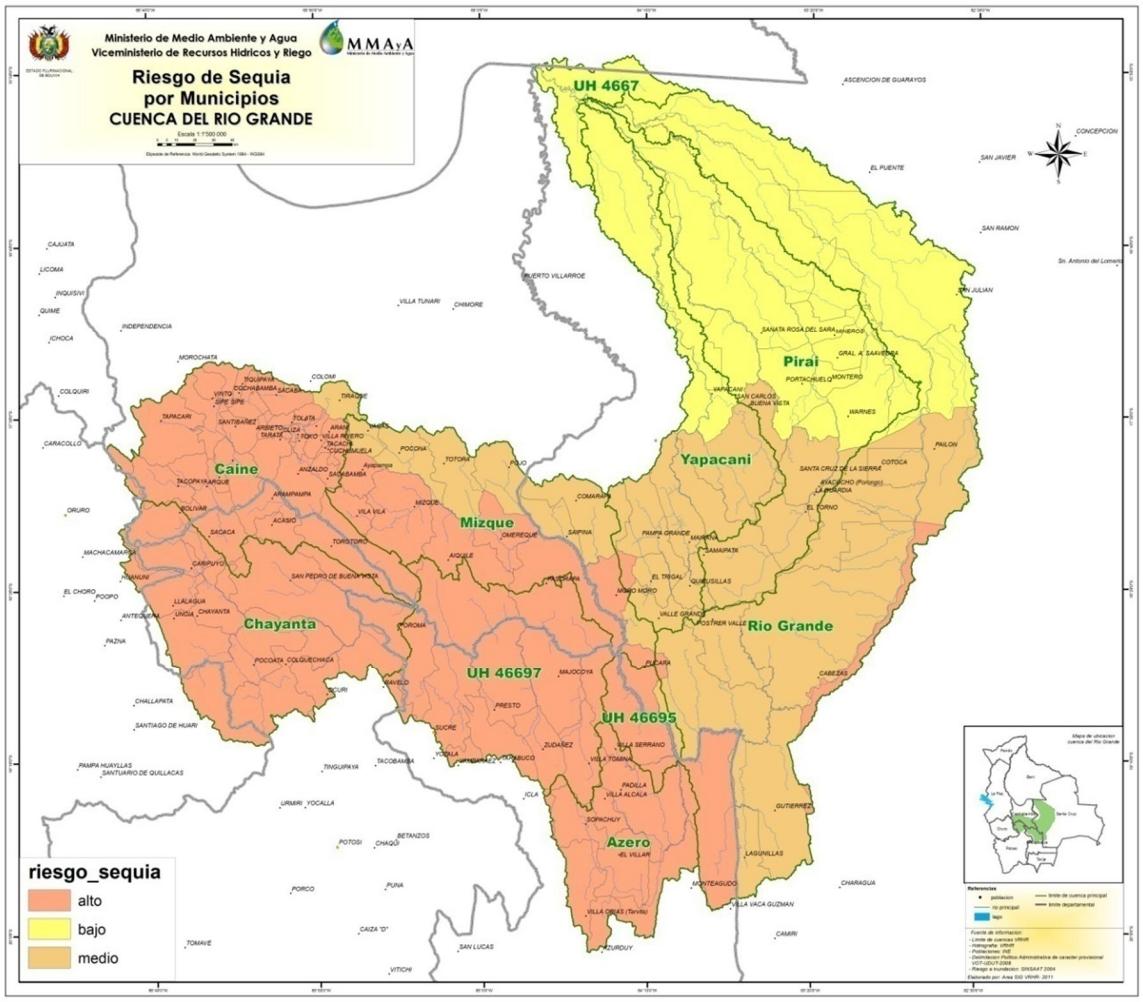
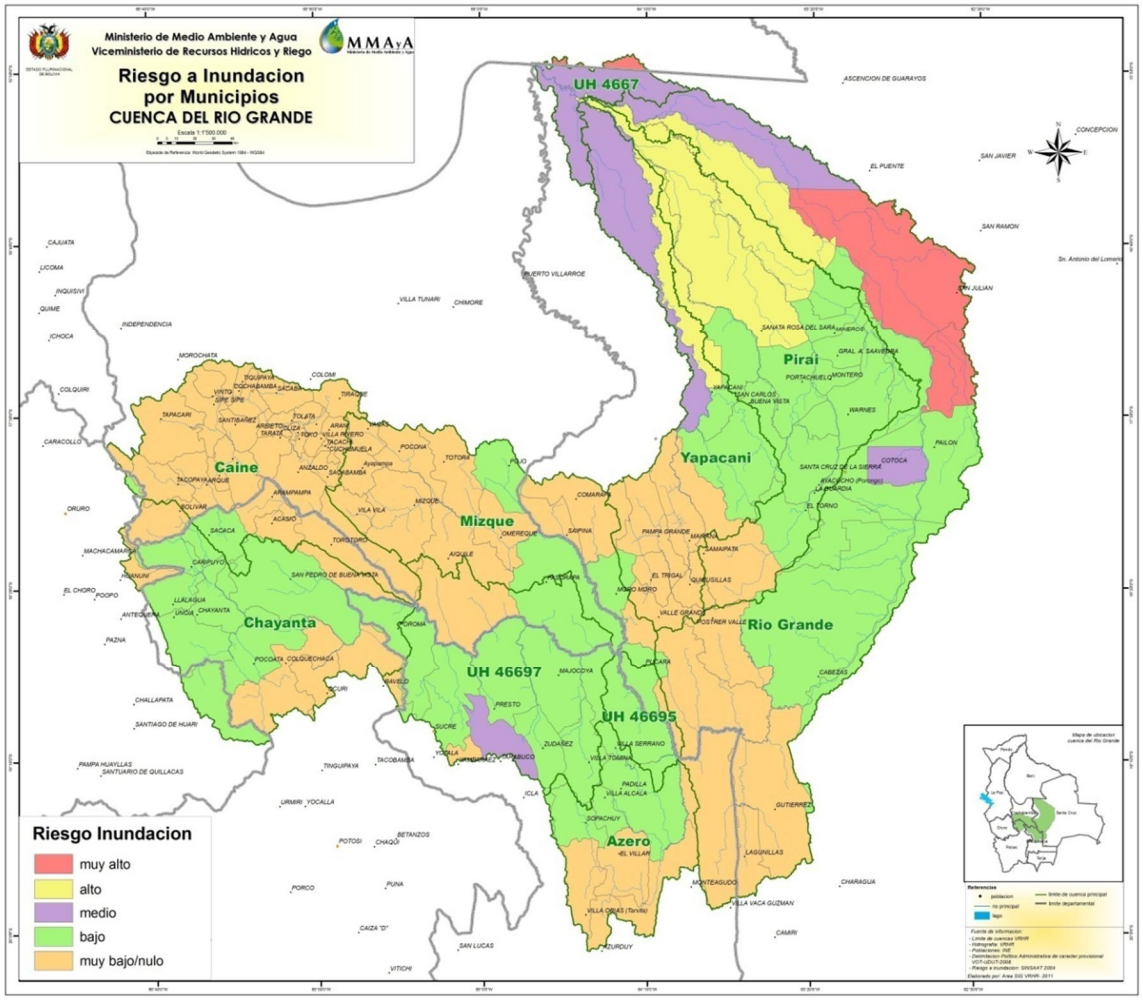
ANNEX 5: Drought and Flood Risks in the Rio Grande Basin




Ministerio de Medio Ambiente y Agua
Viceministerio de Recursos Hidricos y Riego
MMAyA
Riesgo a Inundacion
por Municipios
CUENCA DEL RIO GRANDE
UH 4667
Pirai
Yapacani
Caine
Mizque
Chayanta
Rio Grande
UH 46697
UH 46695
Azero
Riesgo Inundacion
muy alto
alto
medio
bajo
muy bajo/nulo

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ANNEX 6: Relevant projects for the PPCR in Bolivia

Program or Project Title	Government Institution	International Cooperation Agency	Program or Project Description	Years	Budget US$	Budget Euros
ADAPTATION TO CLIMATE CHANGE AND DISASTER RISK MANAGEMENT						
Project of Adaptation to the Impact of Accelerated Glacier Recession in the Tropical Andes (PRAA)	PNCC	WB	Information and climate change scenarios. Pilot projects in the cities of La Paz and El Alto related to: i) urban water use and resilience to climate change, ii) integrated river basin management and climate resilient rural development, and iii) risk management	4	2,300,000	
Program for Disaster Risk Reduction (PRRD)	MPD - VIPFE MDRyT - VDRA Departments	SDC	Developing risk governance in the decentralized public planning processes, agricultural risk management, integration with other programs of the COSUDE in Bolivia, technical assistance	4	10,000,000	
Support for the extension of the environmental program	MDRyT, MPD	DANIDA	The program will support public sector environmental management, including support to protected areas in Bolivia, the reduction of pollution from the mining industry and, finally, support civil society in issues relating to the and climate change	2	25,000,000	
PROAGRO (Water for agricultural production and integrated river basin management)	MMAyA - VRHR	GIZ-ASDI	Developing of irrigation projects for agricultural production, integrated river basin management and agricultural production and commercialization (Cross-cutting issue: adapting to climate change)	3		18,000,000
Emergency Recovery Project and Disaster Management		WB	Program to fund emergency and disaster management		16,900,000	
Support program for building resilience in the city of La Paz	GAMLP	UNDP	Strengthening of the Autonomous Municipal Government of La Paz, linked to territorial planning		1,200,000	
Systematization and information of adaptation to climate change		UNDP	Systematization and information for adaptation to climate change in sectors related to water and food security		500,000	
Financing facility for the contingent attention of emergencies caused by natural phenomena	MPD	CAF	Provision of immediate care to the populations affected by natural disasters, and restoration of critical services in the areas affected by the corresponding natural emergency	4	75,000,000	
Small donations program for adaptation to climate change initiatives		UNDP	Funding of initiatives focused on climate change adaptation	2	2,200,000	
Recovery of food-insecure households affected by	WFP	WFP	Resilience program at the community level, focusing on food	2	3,000,000	

consecutive natural disasters			security			
Drought monitoring system in *El Chaco*	WFP	WFP	Implementation of drought monitoring in *El Chaco*	2	100,000	
Support in the formulation of public policies and post-disaster recovery strategies		UNDP	Support for the information on the new guides on land use with a focus on RDD		500,000	
INTEGRATED RIVER BASIN MANAGEMENT						
National River basins Program (Basket Fund)	MMAyA - VRHR	AECID	Support for the development and implementation of the National River basin Management Plan. Recently the project has also incorporated some initial efforts to include climate change adaptation; although national, the project nonetheless focuses only on five river basins, including the Rio Grande	5	25,000,000	
		KfW			10,000,000	
		COSUDE			8,000,000	
		Netherlands			4,750,000	
Sector Support to the National River basins Program	MMAyA - VRHR	EU Commission	Budget Support for the PNC and Technical Assistance	4		19,000,000
Support Program for Community-based Irrigation (PARC)	MMAyA - VRHR	Belgium	Contribution to food sovereignty and poverty reduction in the sub-basins of intervention, generating self-sustainable production systems aimed at increasing farmers' income and ensure food production	4	7,600,000	
National Irrigation Program "Water and Climate Change"	MMAyA - VRHR / EMAGUA	KfW	Contribution to the adaptation of agricultural production to climate change impacts. Program under negotiation.	5	16,800,000	
River basins Management Program (PROMAC)	MMAyA - VRHR	KfW	Contribution to the National River basins Plan with investments in integrated river basin management. Program under negotiation.	4	14,000,000	
Water and Irrigation Program for Bolivia (PROAR)	MMAyA - VRHR	CAF	Contribution to help ensure the country's food sovereignty and poverty reduction through increased agricultural production and productivity, and the implementation of the strategies outlined in the National Irrigation Development Plan (PNDR)	4	126,000,000	
MIAGUA Program (irrigation and basic sanitation)	MMAyA - VAPSB	CAF	Support of the government's strategies for poverty reduction and achieving food sovereignty by increasing the productive capacity of small and medium farmers Contribution to improving the live and health conditions of the population through increased access to- and better quality of the provision of potable water and sanitation in the country	3	75,000,000	
National Irrigation Program with a River basin Approach (PRONAREC)	MMAyA - VRHR	IDB	Growth in farm income of rural households through the increment of the agricultural area under irrigation and improved efficiency in the use and distribution of water for agricultural purposes	4		
Project for natural resources management of the Poopó Lake		EU Commission	Program focused on natural resource management, environmental remediation and institutional strengthening			14,000,000

Food Facility (EU)	MDRyT - VDRA	WFP	Financing of drip irrigation systems and water pumping for school gardens	3		2,000,000
SIRIC Irrigation Program	MMAyA - VRHR Departments of Santa Cruz and Chuquisca	KfW	Contribution to poverty reduction in the regions where the program is being implemented by the structural strengthening of the Bolivian irrigation sector and increasing the income of recipients. Program under execution.	4	24,300,000	
ENVIRONMENT, BIODIVERSITY AND FORESTRY						
Support Project for the Initiative of Deforestation Reduction and Forest Comprehensive Management	MMAyA - VMACCGF / PNCC	KfW	Support for the Bolivian government in its efforts to address the problems of deforestation and forest degradation. Project under negotiation.	4	11,200,000	
Bio-culture Program		COSUDE			11,000,000	
Program for Biodiversity and Protected Areas (BIAP) I and II	MMAyA - SERNAP	KfW	Contribution to biodiversity conservation in Bolivia with the financing of several measures in 9 protected areas: Tipnis, Madidi, Cotapata, Sajama, Tariquía, Amboro Apolobamba, Pilon Lajas and Manuripi. Program under execution.	4		14,200,000
Program for emissions from deforestation and forest degradation under the REDD mechanism		WB			3,600,000	
Sector Support Program for Protected Areas	SERNAP	EU Commission	Budget Support for SERNAP			22,000,000
Program of sustainable forest management in *El Chaco*		GEF	Support for the development of forest management policies to reduce degradation		1,700,000	
Biodiversity conservation and forest certification program		GEF	Generation of biodiversity, forest certification and timber products		6,500,000	
UNREDD		FAO UNDP	Development of mechanisms and criteria of deforestation		4,500,000	
PRRO	WFP	WFP	Reforestation projects and construction of nurseries (food for work)	3	18,000,000	
PRRO (Japan, Switzerland)	WFP	WFP	Implementation of irrigation systems, potable water supply and reconstruction of latrines (food for work)	3	12,000,000	
RURAL DEVELOPMENT						
Community Investments Program	MDRyT - VDRA - EMPODERAR	WB	Community Investment Program in the rural areas of the departments of La Paz, Oruro, Cochabamba and Chuquisaca	4	45,000,000	
Innovation and Agricultural Services Project	MDRyT - VDRA - INIAF	WB	Program to develop the services of the National Institute of Agricultural and Forestry Research	4	39,000,000	
		DANIDA			2,300,000	
		COSUDE			2,600,00	
Rural Alliances Project	MDRyT - VDRA -	WB	Support the production of food within the Food Security and	8	80,000.000	

	EMPOWER		Sovereignty strategy, part of the policy framework for the transformation of production patterns and the Food Sector Development Plan " Rural, Agricultural and Forestry Revolution"			
Territorial Economic Development with Inclusion Program	MDRyT - VDRA - EMPOWER	DANIDA		3	9,200,000	
Project for Direct Support for the Creation of Rural Agri-Food Initiatives	MDRyT - VDRA - PASA	IDB		4	20,000,000	
Program of comprehensive development with coca	MDRyT - VDIC	EU	Program for Sector Budget Support	4		18,500,000
WATER AND SANITATION						
Guadalquivir Potable Water and Sewerage Program	MMAyA - VAPSB	KfW	Contribution, under the concept of an integrated solution to improve the potable water supply and sewerage systems, in different municipalities of Tarija-Cercado, San Lorenzo, Padcaya, Uriondo. Program under negotiation.	5	17,000,000	
Sucre Potable Water Project III (Sasanta - Yurubamba)	MMAyA - VAPSB	KfW	Project to increase the coverage and improve the quality and sustainability of water services in the city of Sucre. Project under negotiation.	5	14,000,000	
Potable Water and Basic Sanitation – Periurbans Program	MMAyA - VAPSB	IDB	Program to finance water projects and basic sanitation, as well as the institutional strengthening of service providers in peri-urban areas	4	100,000,000	
Water, Irrigation and Drainage Program	MMAyA - VAPSB	CAF	Program to finance water, irrigation and drainage projects	3	44,000,000	

ANNEX 7: Proposal from the MMAyA Team (DGP, PNCC-VMABCCGF and VAPSB):

Program for Multiple and Efficient Use of Water focused on climate resilience of the city of El Alto and micro-basins water providers

i) ***Investment projects that integrate the climate resilience Program for the water and sanitation systems of the metropolitan areas of La Paz and El Alto***

Número de proyecto	Nombre del Proyecto	Objetivo General	Cobertura General del proyecto	Estado de Situación Actual del proyecto	RELACIÓN ENTRE CADA PROYECTO IDENTIFICADO A NIVEL PAÍS Y LA PROPUESTA PARA EL PPCR II			Monto de Inversión requerido (US$)	Fuente de Financiamiento	Estado del financiamiento
					Cobertura de interés al Programa PPCR II	Componentes del proyecto / programa para las ciudades de La Paz y El Alto	Pasos a Seguir para continuar con la elaboración de la PROPUESTA			
1	Proyecto multipropósito de recurso hídrico para El Alto y La Paz	Mejorar la disponibilidad y eficiencia en el uso de recursos hídricos para consumo de agua potable, riego para la producción agropecuaria, generación de energía hidroeléctrica, u otros usos posibles de este vital elemento, ante la creciente escasez de agua provocada por las migraciones climáticas.	Parte sur de la la ciudad de El Alto (distritos 3, 4, 7 , 8, 9, 11 y 12)	• Se cuenta con TDRs definitivos para la realización del Estudio de Identificación (Estudio EI) • Se cuenta con fondos para cubrir el Estudio de Identificación (EI)	Parte sur de la la ciudad de El Alto (distritos 3, 4, 7, 8, 9, 11 y 12)	• Mejoramiento del sistema de riego "Tupac Katari y Suriquiña", en el caso de ser seleccionada la alternativa • Abastecimiento de agua potable para el área urbana (La Paz y El Alto) y rural del área de influencia de la alternativa • Manejo Integral de la(s) Microcuenca(s) de la alternativa seleccionada • Generación de energía hidroeléctrica	• El proyecto comprende el Estudio de Identificación mismo que debe presentar alternativas, se seleccionará aquella más conveniente (EI: Infuencia del cambio climático, balance hídrico, consulta pública, acuerdos sociales entre actores clave, diagnóstico de las microcuencas Khara Khota, Taypi Chaka, janchalani, Jacha Waquiwiña, Chojña Jipiña, Tuni, Condoriri, huayna Potosi, Milluni, Chacaltaya y Choqueyapu). • Realizar TDRs para estudio concreto sobre el caudal ecológico que requieren los bofedales como ecosistemas frágiles e indicadores del cambio climático. • Coordinación con MPD. • Inclusión de mayor información en la propuesta: -Justificación del problema de cambio climático y desarrollo -Contexto de políticas públicas -Participación de otras instituciones (GTZ, JICA, SENAMHI, ESPSAS, etc.).	68,000,000.00	US$50 MM con CIF (PPCR II) US$12,4 MM con fondos de contraparte (Gobierrnos Municipales de La Paz y El Alto) y US$9,6 MM con otras fuentes (Apalancamiento)	Gestiones ante CIF y otras instancias para apalancamiento
2	Construcción del subsistema Chuquiaguillo	Abastecer de agua potable al Talud Este y zonas del distrito de La Paz que no cuentan con el servicio, **liberando aproximadamente 200 lt/s de agua para el Sistema El Alto.**	Talud Este y zonas sin servicios de Chuquiaguillo y Khalajahuira de la ciudad de La Paz	Proceso de revisión y preparación de documentos para la no objeción de la CAF, asimismo, se elaboró el reglamento operativo del programa Agua y Riego PROAR y el MMAyA está conformando la unidad Ejecutora del Programa, posteriormente se procederá con la licitación del proyecto	Ciudades de El Alto y La Paz.	• Presa de almacenamiento de Hampaturi Alto. • Planta de potabilización de Chuquiaguillo • Tuberías de interconección desde la planta de Chuquiaguillo hasta las redes existentes en el Talud Este	Consultar diseño final de los documentos para identificar las interacciones específicas e incluir el enfoque de resiliencia climática.	31,248,000.00	CAF(crédito)	En ejecución
3	Proyecto de Agua y Saneamiento	Mejoramiento y ampliación de redes de agua potable y	Distritos 3, 4, 7, 8, 12 y 14 de la ciudad de El Alto	En proceso de revisión y preparación de documentos para presentar a la CAF y modificar la estructura financiera del credito	Distritos 3, 4, 7, 8, 12 y 14 de la ciudad de El Alto	• Redes de agua potable • Redes de saneamiento	•Aprobación de la CAF de la estructura de financiamiento del Programa Agua y Riego PROAR. El equipo de formulación del SPCR	16,030,629.53	CAF(crédito)	En ejecución

		saneamiento.		N° 6993 CFA Programa de agua y Riego PROAR. En caso de que la CAF acepte la modificación del programa, se procederá a la licitación de obras por el ente ejecutor			podría consultar los documentos a diseño final para identificar las interacciones específicas.			
4	Construcción de colectores principales de alcantarillado en el distrito 8 de la ciudad de El Alto	Ejecutar la infraestructura principal para la posterior ejecución de redes de recolección del sistema de alcantarillado.	Distrito 8 de la ciudad de El Alto	El proyecto está en fase de ejecucion, esta obra permitirá que el D-8 que no cuenta con alcantarillado sanitario podrá construir redes de recolección y conexiones domiciliarias, se espera concluir la obra hasta fines de esta gestión	Distrito 8 de la ciudad de El Alto	• Inversión realizada por el MMayA- GAMEA con participación del 80 y 20 % respectivamente en la inversión, se están ejecutando colectores de 1er, 2do y emisario así como la tubería de impulsión hasta la PTAR de Puchukollo	Establecer claramente en el documento el vínculo con los proyectos nuevos de abastecimiento de agua potable, que generan la necesidad de realizar inversiones en alcantarillado.	3,289,640.00	Unión Europea (donación PASAS 1 y 2)	En ejecución
5	Construcción de colectotres principales de alcantarillado sanitario en los distritos 7 y 14 de la ciudad de El Alto	Ejecutar la infraestructura principal para la posterior ejecución de redes de recolección del sistema de alcantarillado.	Distritos 7 y 14 de la ciudad de El Alto	El proyecto está en fase de ejecución, esta obra permitirá que los distritos 7 y 14 que no cuentan un sistema de alcantarillado sanitario puedan construir redes de recoleccion, conexiones domiciliarias cuyo tratamiento de las aguas residuales será realizado en la PTAR de Tacachira, se espera concluir la obra hasta fines de esta gestión	Distritos 7 y 14 de la ciudad de El Alto	• Inversion realizada por el MMayA- GAMEA con participación del 80 y 20 % respectivamente en la inversion, se están ejecutando colectores de 1er, 2do orden así como cámaras de inspección y emisario hasta la futura PTAR de Tacachira	Establecer claramente en el documento el vínculo con los proyectos nuevos de abastecimiento de agua potable, que generan la necesidad de realizar inversiones en alcantarillado.	2,116,515.43	Unión Europea (donación PASAS 1 y 2)	En ejecución
6	Construcción de la planta de tratamiento de aguas residuales (PTAR) de Tacachira para tratar las aguas residuales de los distritos 7 y 14 de la ciudad de El Alto	Ejecutar las instalaciones civiles, electromecánicas, sistemas de control operacional de la PTAR de Tacachira que tratará las aguas de origen doméstico provenientes de las redes de recolección de los distritos 7 y 14 de la ciudad de El Alto.	Distritos 7 y 14 de la ciudad de El Alto	El proyecto está en su fase de actualización de precios por parte del operador (EPSAS) y el GAMEA para sus posterior envío al MMayA y a la CAF para solicitar el primer desembolso y proceder a la convocatoria pública por parte del GAMEA	Distritos 7 y 14 de la ciudad de El Alto	Credito gestionado por el Gobierno Nacional y transferido por el MMAyA al GAMEA a través de un convenio susbsidiario, el proyecto contempla la ejecución de las obras civiles, instalaciones electromecánicas y sistemas de control operacional de la PTAR de Tacachira, estas instalaciones tratarán las aguas residuales de los distritos 7 y 14 de la ciudad de El Alto	Establecer claramente en el documento el vínculo con los proyectos nuevos de abastecimiento de agua potable, que generan la necesidad de realizar inversiones en alcantarillado.	4,453,401.14	Crédito de la CAF N° 5544	En ejecución
7	Implementación de medidas piloto de adaptación al cambio climático en el Municipio de Batallas, en el marco del proyecto PRAA	Diseñar e implementar medidas de adaptación al retroceso glaciar y sus implicancias sobre la disponibilidad de agua, con sus respectivos sistemas de	Ciudades de El Alto y La Paz, y Municipios de Batallas y Palca	Proyecto actualmente financiado en el marco del PRAA a través del PNCC. Situación por componente: 1) TDRs elaborados, aguardando la no objeción del Banco Muncial. Consultoría por producto contemplada para 6 a 9 meses 2) Se contará con el diseño de las medidas de implementación	El Alto y Municipio de Batallas	1) Plan Maestro de El Alto incluye variables de cambio climático (US$17 mil) 2) Investigación aplicada para adaptación y cambio climático en el Municipio de Batallas: agua para	Cuenta con el enfoque de resiliencia climática. Continuar coordinando con el PRAA, sobre todo para lecciones aprendidas de las actividades en ejecución.	952,000.00	Global Environmental Facility (Agencia de implementación: Banco Mundial)	En ejecución

		Monitoreo y Evaluación para el área urbana, con consideraciones del agua como un servicio, acompañados de una estrategia y/o plan de desarrollo en el área de influencia en las ciudades de La Paz y El Alto, preparado de forma participativa con los actores claves.		hasta mayo de 2011 3) Planes de Manejo de Microcuencas elaborados, en revisión hasta fines de abril 4) Estudio en curso hasta julio 2011 5) TDRs para el estudio en elaboración. Se espera contratar la consultoría en aproximadamente 2 meses y realizar el estudio en 6 meses		consumo o agua segura, agua para las actividades agropecuarias o riego, y medidas agropecuarias 3) Planes de Manejo de 2 Microcuencas Cullu Kachi (Componente 2 y 3: US$900 mil, desglosados GEF US$500 mil + contraparte US$400 mil). 4) Estudio de retracción de glaciares ante el cambio climático 5) Estudio de comportamiento de bofedales ante el cambio climático: inventario glaciar, identificación de bofedales, estado pasado y actual de los mismos (Componente 4 y 5: US35,000)				
8	Programa de Agua y Alcantarillado Periurbano BID-AECID	Contribuir a mejorar la salud en poblaciones periurbanas y otras ciudades de Bolivia, cuyo objetivo específico es incrementar el acceso a los servicios de agua potable y alcantarillado en las aéreas periurbanas de El Alto, La Paz, Cochabamba, Santa Cruz, Tarija y otras ciudades.	Ciudades de El Alto, La Paz, Cochabamba, Santa Cruz, Tarija y otras ciudades con poblaciones mayores a 10,000 habitantes	El financiamiento del Programa fué aprobado a través de: (i) el Convenio de Financiamiento no Reembolsable de Inversión del Fondo Español de Cooperación para Agua y Saneamiento en América Latina y el Caribe N° GRT/WS-11830-BO, por un monto de US$80 MM (firmado el 27/11/2009) y (ii) el Contrato de Préstamo N° 2199/BL-BO del E. P. De Bolivia y el BID, por US$20 MM (firmado el 27/11/2009). Los Ministerios de Planificación del Desarrollo y de Economía y Finanzas Públicas suscribieron el Convenio Subsidiario con el MMAyA el 28/09/2010, desde entonces es el MMAyA el responsable de la ejecución del Programa. En El Alto, con recursos del programa se está financiando la ejecución de los siguientes proyectos: (i) Proyecto de Agua Potable y Alcantarillado Sanitario Distritos 7 y 14 – El Alto (Monto aprobado US$1,984,877.91 para obras, supervisión y DESCOM), (ii) Ampliación del Sistema de Alcantarillado Sanitario Distrito 8 de la Ciudad de El Alto (Monto aprobado US$6,676,515.00 para obras, supervisión y DESCOM), y (iii) Plan Maestro Metropolitano de agua potable y saneamiento	Ciudad de El Alto	1. Componente 1: Inversiones en agua potable y saneamiento: (i) obras civiles y equipos, (ii) supervisión y fiscalización de obras, (iii) desarrollo comunitario 2. Componente 2: Estudios de preinversión y Planes Maestros Metropolitanos: (i) planes maestros metropolitanos, y (ii) diseños y estudios complementarios 3. Componente 3: Fortalecimiento institucional: (i) operadores (ii) SENASBA, (iii) MMAyA/EMAGUA, y (iv) AAPS	El diseño de los proyectos debe incluir enfoques de adaptación al cambio climático. El Plan Maestro de Agua y Saneamiento incluirá los efectos del cambio climático (esta previsto en los TDR)	10,761,392.91	BID/ESPAÑA: FECASALC 80% donación BID 20% crédito.	En ejecución

				para las ciudades de La Paz, El Alto y Municipios colindantes ($US 2.100.000,00)						
9	Programa Barrios de Verdad: proyecto mejoramiento de barrios.	Mejorar las condiciones de vida de los sectores más pobres del país en áres urbanas.	Ciudades de La Paz y El Alto	El FNDR (MPD) está ejecutando los dos proyectos. Préstamo aprobado el año 2009, elegible a inicios del 2010	Barrios Franz Tamayo y Gran Poder de la ciudad de El Alto	• Mejoramiento de las vías públicas • Equipamiento sociocomunal de la casa comunal de las juntas de vecinos • Mejoramiento del alumbrado público • Mejoramiento de alcantarillado y agua potable	Incluir un componente o enfoque de resiliencia climática.	*4,000,000.00*	BID (crédito), con aprox 20% de aporte local. El monto es aproximado, por confirmar.	En ejecución
10	Programa de drenaje pluvial para la ciudad de La Paz a corto plazo	Contribuir al mejoramiento de la calidad de vida de los habitantes del Municipio de La Paz, mediante la disminución de los daños humanos y materiales causados por eventos geo-hidro-meteorológicos extremos mediante la implementación de obras y acciones complementarias para mejorar el sistema de drenaje pluvial de La Paz, y de su gestión.	Ciudad de La Paz	Contrato elaborado para su suscripción con el Gobierno Municipal de La Paz	Ciudad de La Paz	• Control de inundaciones y erosión • Desarrollo institucional y gestión ambiental	Incluir el enfoque de resiliencia climática.	15,000,000.00	BID (US$15 MM crédito y US$1.5 MM contraparte GAMEA La Paz)	Convenios susbsidiarios a ser suscritos entre el MPD y el Gobierno Autónomo Municipal de La Paz.
11	Programa de drenaje pluvial para la ciudad de La Paz a mediano y largo plazo	Contribuir al mejoramiento de la calidad de vida de los habitantes del Municipio de La Paz, mediante la disminución de los daños humanos y materiales causados por eventos geo-hidro-meteorológicos extremos mediante la implementación de obras y acciones complementarias para mejorar el sistema de drenaje pluvial de La Paz, y de su gestión.	Ciudad de La Paz	El GAMEA requiere de financiamiento para ejecutar las obras propuestas en el plan Maestro de Drenaje para el área urbana de La Paz del año 2007	Ciudad de La Paz	• Control de inundaciones y erosión • Desarrollo institucional y gestión ambiental	Incluir el enfoque de resiliencia climática.	34,738,267.00	No se cuenta aun con la institución a la cual el GAMLP podría solicitar el financiamiento de estas obras.	No se conoce la fuente de financiamiento.

	Nombre del Programa	Objetivo General	Cobertura General	Estado de Situación Actual del	RELACIÓN ENTRE EL PROGRAMA IDENTIFICADO A NIVEL PAÍS Y LA PROPUESTA PARA EL PPCR II			Monto de Inversión	Fuente de Financiamiento	Estado del financiamiento
12	Programa de drenaje pluvial para la ciudad El Alto	Contribuir al mejoramiento de la calidad de vida de los habitantes del Municipio de El Alto, mediante la disminución de los daños humanos y materiales causados por eventos geo-hidro-meteorológicos extremos mediante la implementación de obras y acciones complementarias para mejorar el sistema de drenaje pluvial de El Alto, y de su gestión.	Ciudad de El Alto	Contrato elaborado para su suscripción con el Gobierno Municipal de El Alto	Ciudad de El Alto	• Control de inundaciones y erosión • Desarrollo institucional y gestión ambiental	Incluir el enfoque de resiliencia climática.	15,000,000.00	BID (US$15 MM crédito y US$1.5 MM contraparte GAMEA El Alto)	Convenios susbsidiarios a ser suscritos entre el MPD y el Gobierno Autónomo Municipal de El Alto.

			del Programa	Programa	Cobertura de interés al Programa PPCR II	Componentes del proyecto / programa para la ciudad de El Alto y el Municipio de Batallas	Pasos a Seguir para continuar con la elaboración de la PROPUESTA	requerido (US$)		
1	Proyecto Estudios de Cambio Climático	Promover un mayor conocimiento de los temas surgidos como consecuencia del cambio climático. Fortalecer capacidades y conocimientos para reducir la vulnerabilidad frente a los impactos negativos del cambio climático en comunidades.	Municipios y comunidades de las regiones del Lago Titicaca (Batallas, Ancoraimes, Moco Moco y Carabuco) y los Valles Cruceños.	*Primera Fase:* Estudio de vulnerabilidad y Adaptación al Cambio Climático en Bolivia *Segunda Fase:* 5 proyectos piloto puntuales en adaptación al cambio climático implementados. *Tercera Fase:* 5 proyectos en gestiones, y 3 proyectos con convenios firmados entre Gobiernos Municipales y MMAyA	Municipios y comunidades de las regiones del Lago Titicaca (Batallas, Ancoraimes, Moco Moco y Carabuco)	Educación, Capacitación y Concientización sobre la temática del cambio climático, dirigida a diferentes públicos meta. Acciones puntuales referidos al ciclo y fuentes de agua vinculados al cambio climático (calidad, disponibilidad, etc.) y sus impactos.	Utilizar el diagnóstico de percepciones locales sobre vulnerabilidad al Cambio Climático. Resaltar la lecciones aprendidas (ventajas y desventajas) de los proyectos ejecutados y en ejecución para aplicarlos en los proyectos nuevos de los sistemas de captación para abastecimiento de agua potable.	720,000.00	Cooperación de los Países Bajos a través del PNCC.	En ejecución.

	TOTAL en $US							**206,309,846.01**		

ANNEX 8: Summary of Consultations Organized inside the PPCR Framework

Consultation	Date	Organizer	Place	Number of participants	Key issues
CONSULTATION FOR PHASE I					
Regional Consultation	October 28-30, 2009	National Climate Change Program PNCC	Santa Cruz	52	Objective: get to know the PPCR and organize working groups for feedback on the proposal in the departments of Beni, Pando, Tarija and Santa Cruz. Recommendations on thematic axes and priority areas of intervention.
Regional Consultation	November 11-13, 2009	National Climate Change Program PNCC	Cochabamba	101	Objective: get to know the PPCR and organize working groups for feedback on the proposal in the departments of Cochabamba, La Paz, Potosí, Oruro and Chuquisaca. Recommendations on thematic axes and priority areas of intervention.
National Consultation	February 18-19, 2010	National Climate Change Program PNCC	La Paz	78	Feedback on the proposed sector project profiles.
NATIONAL CONSULTATIONS FOR PHASE II					
1st Workshop: Event "Bolivia Mobilized in the Face of Climate Change" - Identifying climate vulnerabilities and measures for adaptation to climate change	November 23-24, 2010	National Climate Change Program PNCC	La Paz	268	Identification of climate vulnerabilities and measures for adaptation to climate change. General presentations, plenary sessions, regional and sectoral workshops. Collective building and/or feedback for the Climate Resilience Strategic Programs for each sector.
2ndWorkshop: Event "Bolivia Mobilized in the Face of Climate Change" - Proposals for sectoral actions of adaptation and climate resilience	December 15-16, 2010	National Climate Change Program PNCC	La Paz	65	Progress on the Climate Resilience Strategic Programs considering the feedback and/or remarks given at the first workshop.
SECTORAL CONSULTATIONS					
Sectoral Workshop as part of the joint mission in March 2011	March 28 to April 1, 2011	National Climate Change Program PNCC	La Paz	45	Presentations of specific investment proposals for the different sectors prioritized in Phase I and discussion of

					those proposals.
Working of 5 sector consultants to incorporate climate change adaptation in the sectors prioritized by the MNACC	2nd semester of 2010	National Climate Change Program PNCC	La Paz		Each sector consultant worked between 3 and 6 months to develop a strategic plan for climate change in the corresponding sector.
Activities and presentations made at the preliminary design stage of the investment programs for different sectors	Between February and April 2011	National Climate Change Program PNCC	La Paz		Multiple workshops to develop sectoral proposals related to the issues: water resources, agro-forestry and forests, biodiversity and ecosystems, education and climate change, climate change observation centers, food security.
REGIONAL CONSULTATIONS					
Consultation with key stakeholders in El Alto: Meeting in Suriquiña	July 24, 2011		El Alto	98	Presentation of the projects within the water resources program to the people of Suriquiña. Mainly focused on Component 2.
Consultation Workshop for the Strategic Program for Climate Resilience PPCR Phase II: Piraí Sub-basin	September 14, 2011	VRHR, WB and UNDP Consultant	Santa Cruz	25	Introduction, socialization and validation of the proposed SPCR. Work to identify priorities, meeting points and synergies. Development of some strategic lines, Gender approach. Mainly focused on Component 3.
Consultation Workshop for the Strategic Program for Climate Resilience PPCR Phase II: Mizque Sub-basin	September 15, 2011	VRHR, WB consultants and UNDP	Cochabamba	23	Introduction, socialization and validation of the proposed SPCR. Work to identify priorities, meeting points and synergies. Development of some strategic lines, Gender approach. Mainly focused on Component 3.
GENDER CONSULTATIONS					
Workshop "Gender and adaptation to climate change"	March 28, 2010	National Climate Change Program PNCC	Cochabamba	210	Analysis of differentiated gender roles. Explanation of the objective of integrating the gender approach, enhance equality and equity, while strengthening the capacities to address climate change at the same time. Different approaches to gender and its potential to address climate change were discussed. Identify skills to operationalize gender in

					climate change. Rapid diagnosis of major impacts and potential response actions.
3rdSocial Summit of Women to Tackle Climate Change	July 24-25, 2011	National Climate Change Program PNCC	Cochabamba	260	Open dialogue spaces to achieve a greater understanding of the impacts and effects of climate change from a gender perspective.
Focus Group Workshop: Gender and Climate Change: Piraí Sub-basin	September 14, 2011	Vice Ministry of Water Resources and Irrigation	Santa Cruz	6	Discussion of the gender approach in CEPAC, presentation of methodology, obtained results.
Focus Group Workshop: Gender and Climate Change: Mizque Sub-basin	September 15, 2011	Vice Ministry of Water Resources and Irrigation	Cochabamba	5	Discussion on gender approach in PROAGRO/GIZ projects, presentation of methodology, obtained results. Presentation of the gender approach in other institutions: work groups on Climate Change and Justice, Radio Esperanza. Brief discussion with PROAGRO/GIZ project beneficiaries.
CONSULTATION WITH INTERNATIONAL COOPERATION AGENCIES					
Meeting with donors to receive sectoral information	March 2011	The joint mission with the National Climate Change Program.	La Paz		Donors expressed strong interest in knowing more about the PPCR. The multi-sectoral approach was well received but there were questions about how to operationalize the project with so many sectors.
Meeting with donors to present the river basin approach in the PPCR	July 2011	Vice Ministry of Water Resources and Irrigation and WB	La Paz		The river basin approach was well received and donors confirmed the need to strengthen the focus of climate change in the sector. Donors stressed that there is progress and that the PPCR should be based on existing experiences and coordinated with donors in the sector. The multi-sectoral approach was well received.
Meetings with representatives of the International Cooperation for Preparation of the SPCR	August-September 2011	SPCR Consulting Team	La Paz		Inputs for SPCR, important data, contacts. Gender approach, delivery of material. Summary and background of Phase I of the PPCR, guidance on consultations.
Meetings for presentation of the	September 19,	The joint mission with the	La Paz		The proposal was received without much

strategic lines of the SPCR and examine coordination possibilities	2011	Vice Ministry of Water Resources and Irrigation			comment. However, donors emphasized a need for technical assistance to avoid traditional investments (business as usual) and focus on investments in pilot projects resilient to climate change.

ANNEX 9: Independent Technical Review

Title of the investment plan:	Estado Plurinacional de Bolivia: Programa Estratégico de Resiliencia Climática / Strategic Program for Climate Resilience (SPCR)
Program under the SCF:	Pilot Program for Climate Resilience (PPCR)
Name of the reviewer:	Lykke E. Andersen, Ph.D.
Date of submission:	October 12, 2011

Part I: General criteria:

The main objective of the PPCR is to integrate climate resilience into development planning in an integral manner. Considering its nature as a pilot program, it intends to initiate a transformative process by generating the knowledge and institutional capacity needed to do this on a wider scale.

The Bolivian Strategy complies with this main objective by proposing both institutional capacity building (mainly data generation and inter-institutional coordination) and three pilot projects for knowledge generation. The latter have been chosen to span the three main eco-regions in Bolivia (highlands, valleys and lowlands) and cover the three main climate challenges (droughts, floods, and diminishing water supply from disappearing glaciers). One of the initiatives is targeted at the main urban conglomeration in Bolivia (La Paz – El Alto) while the others are targeted at predominantly rural areas and agricultural challenges. The Strategy uses water management as the unifying concept, as it correctly identifies changes in the hydrological cycle as the main threat arising from climate change in Bolivia.

Although there is considerable uncertainty about exactly what climatic changes to expect in the complex geography of Bolivia in the future, the main studies of the impacts of climate change in Bolivia all conclude that changes in the quantity and distribution of water is going to be the main problem[32]. Bolivia already suffers from a very uneven distribution of water, both spatially and temporally, and future population and economic growth will further increase the problems of water scarcity in dry areas and costs of flooding in wet areas, so any investments that help improve the water distribution infrastructure and prevent or reduce the recurrent costs of droughts and floods should constitute no-regrets investments.

The Strategy consists of 3 main components. Component 1 is focusing on institutional capacity building, coordination, data generation and learning, for which a grant of USD 5.5 million is allocated. Component 2 is aimed at increasing the water supply to the urban populations of La Paz and El Alto, both through investments in physical water infrastructure (dams, treatment plants, water pipes, etc.), and through the development of an Integral River basin Management Plan. A grant of USD 54.5 million is allocated for this component. Component 3 is aimed at reducing the costs of extreme climate events in the Rio Grande river basin. It has two main sub-components, the first of which is focused on reducing the recurrent costs of droughts in the dry upper part of the river basin (Río Mizque) and the second of which is aimed at reducing the costs of recurrent flooding in the lower part of the river basin (Río Piraí). A loan of USD 50 million is allocated to the third component.

[32] Bolivia (2007), EACC-WB (2011), ERECC-BID (2010), UNDP (2011).

The total amount requested from the MDBs is USD 110 million, of which USD 50 million would be a loan and USD 60 million a grant. The program provides additional funding of about 10% compared to the projects listed in Annex 6 as relevant for the PPCR in Bolivia, which sum to a bit more than USD 1 billion.

Everybody in Bolivia is affected by water problems, so the choice of making water management the central issue in the Strategy assures that everybody can accept the relevance of the program even if they live outside the pilot river basins. In addition, water problems disproportionately affect women and children and the poorest and most vulnerable parts of the population, so investments to alleviate water problems is likely to be pro-poor and improve especially the lives of women.

While the focus on improved water management makes a lot of sense, the Strategy does not explain how it envisions the transformative impact to take place.

The specific investments in each component are yet to be determined in sufficient detail to allow an evaluation of cost effectiveness. Component 2 currently appears more sustainable and directly beneficial for the country than Components 1 and 3, partly because it is more concrete (structural investments), but also because it uses existing institutions for implementation, instead of creating new, temporary ones as in Components 1 and 3. It is not clear how Component 3 will generate a 12% annual social return, as required by VIPFE for public investments, and the Strategy offers no explanation about how the loan for Component 3 is to be repaid.

Part II: Compliance with the investment criteria or business model of the PPCR

a) Climate risk assessment

There is considerable uncertainty about how climate change may affect the hydrological cycle in Bolivia in the future. Different General Circulation Models (GCMs) predict wildly differing impacts, with some models predicting more precipitation all over the country as a result of increased CO_2 concentrations in the atmosphere (e.g. the ECHO-G Model of the Meteorological Institute of the University of Bonn, Germany), some predicting less precipitation over most of the country (e.g. the CM2.0 Model of NOAA Geophysical Fluid Dynamics Laboratory, USA), some predicting more precipitation in the lowlands and less in the highlands (e.g. the HadCM3 model from the Hadley Centre for Climate Prediction, Met Office, UK), and some the opposite (e.g. the MIROC3.2 model of CCSR/NIES/FRCGC, Japan, as well as PCM1 model of the National Center for Atmospheric Research, USA).[33]

Thus, the range of possible scenarios is very wide and it is clear that Bolivia has to prepare for a lot of uncertainty. However, even in the most favorable scenario (more precipitation in currently dry areas and less in currently wet areas), increased water scarcity in many areas is inevitable due to increased demand, and increased costs of droughts and flooding are expected both due to a probable concentration of precipitation events caused by climate change and due to increased exposure caused by the general expansion of economic activities in vulnerable areas. Thus, the proposed investments are likely to be beneficial no matter which climate model proves to be the most accurate.

[33] See "Atlas de Cambio Climático en Bolivia," La Paz: FAM and CI, 2011 (forthcoming).

A preliminary version of the Strategy mentions a plan to train the staff of SENAMHI and PNCC in the use of one of the abovementioned GCMs and create "official climate change scenarios" based on this one model[34]. This is not advisable as it would give authorities responsible for implementing adaptation measures and climate proofing investments a false sense of certainty about what to prepare for, and indeed force them to prepare for the "official" scenario, although this cannot be demonstrated to be more likely than any of the other scenarios. Authorities need to understand the full range of possible climatic situations that they should prepare for.

b) Institutions/coordination

The Strategy presents an up-to-date, thorough, and honest evaluation of institutional capacity for implementing the plan. The implementation agency is the Ministry of Environment and Water (MMAyA), which encompasses four important actors in the Strategy: The National Program of Climate Change (PNCC), the National Service of Meteorology and Hydrology (SENAMHI), the Vice Ministry of Water and Sanitation (VASB), and the Vice Ministry of Hydrological Resources and Irrigation (VRHR).

The Strategy proposes that a new autonomous National Unit of Program Coordination (UNCP) directly under the MMAyA will be created to coordinate and implement the plan, and that this unit will set up two regional offices in the pilot river basins of Río Mizque and Río Piraí. In addition, an advisory committee will be established to secure coordination with key ministries outside MMAyA, such as the Ministry of Rural Development and Land (MDRyT) and the Ministry of Development Planning (MPD).

This proposed institutional set-up reflects the current weaknesses of PNCC, which would otherwise have been the logical unit for coordinating this pilot project. At its creation in 1995 under the Ministry of Sustainable Development, PNCC was endowed with the responsibility of fulfilling the technical commitments of Bolivia towards the United Nations Framework Convention on Climate Change (UNFCCC) and of coordinating and orienting efforts to adapt to and mitigate the effects of climate change in Bolivia. However, in 2009, PNCC was moved from the Ministry of Development Planning (formerly Ministry of Sustainable Development) to the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management (VMABCCGF). As explained in the Strategy, this status below a Vice Ministry makes it very difficult for PNCC to fulfill a mandate of inter-ministerial coordination.

Although the Strategy explicitly says (p.32) that one of its objectives is to strengthen the PNCC, it seems that in reality it will further weaken it. Rather than contributing to overcoming the current weaknesses of PNCC, the Strategy plans to set up a new temporary unit to handle the program, thus taking responsibilities, budget and learning away from PNCC. Since the new unit is a temporary unit (this is clearly reflected in its name: National Unit of Program Coordination), it is difficult to see how it could achieve sustainability and impact beyond the project.

It is also difficult to see how the planned advisory committee is going to achieve sustained coordination after the project period. As explained in the Strategy, a similar committee ("Consejo Interinstitucional de Cambio Climático"), consisting of 6 ministries and one environmental NGO, was created by Supreme Decree in 1999 and tasked with analyzing and proposing national policies and strategies for implementing the UNFCCC in Bolivia. This committee has not met since

[34] This mention was taken out of the latest version, but according to recent conversations with both PNCC and IDB staff it remains the plan.

2006, however. In the Second National Communication to the UNFCCC (2009), Bolivia announced that it was in the process of forming a "Consejo Plurinacional de Cambio Climático," but this still has not happened. This program may provide an opportunity to activate the "Consejo".

The strengthening of SENAMHI proposed in the Strategy seems better planned, with a good chance of achieving permanent positive impacts. Improving the collection and analysis of hydrological data in Bolivia is crucial for improved river basin management, as is the access to this data for the general public.

Considering the primary objective of integrating climate resilience into development planning, it is surprising that the Ministry of Development Planning (MPD) has hardly any role in the program, except as part of the advisory committee.

c) Prioritization

The pilot activities in the Strategy have been adequately chosen to cover both rural and urban areas, the three main eco-regions in Bolivia, and the three main climate challenges that we need to learn more about. It has identified water management as a unifying concept, as water affects all geographical areas and all the sectors vulnerable to climate change. The main prioritizations made in the Strategy thus seem very well justified.

d) Stakeholder engagement/participation

The Strategy has been elaborated through a participative process including comprehensive stakeholder consultations both across sectors and across regions. In addition, there has been special gender oriented consultations, and numerous meetings with the donor community. Given the risk of a long list of scattered demands from all the diverse stakeholders consulted, it is impressive that the team behind the Strategy has managed to come up with a unifying theme and a small selection of pilot activities which should make all main interest groups feel represented, and especially the most vulnerable.

Part III. Recommendations

The Strategy is very well written, and certainly complies with the criteria and priorities of PPCR. The following are a few suggestions that may contribute to some last-minute improvements.

First, since the main objective of the PPCR is to integrate climate resilience into development planning, the Ministry of Development Planning should be more involved in this program and receive training just like PNCC and SENAMHI. VIPFE, for example, has to approve all public investments in Bolivia, so it would be good if the staff received training that would qualify them to judge whether proposed investments are climate resilient. Strategic Planning staff also needs to be more aware of climate change impacts and strategies to reduce adverse effects. In the current institutional setup, the program is very much concentrated in the Ministry of Environment and Water, which is a good choice as implementing agency, but it should not be limited to that. The proposed institutional setup reflects the widespread perception in the Government that climate change is mainly an environmental problem, while in reality it is a development and planning problem.

Second, it is important that the Strategy explains how it envisions its transformative impact to take place, especially considering the temporary character of the National Unit of Program Coordination (UNCP) and the ad hoc advisory committee. It would be good if the Strategy could

propose a way to overcome PNCC's current weaknesses and thus contribute to a real institutional strengthening, as this program (at least Component 1) ideally should be managed by a permanent government institution with the mandate of promoting climate change adaptation. Since climate change is really a development and planning problem, it would greatly advance the main objective of the PPCR if PNCC could be moved back to the Ministry of Development Planning, instead of languishing under an environmental viceministry, and the Strategy could try to open a door for that opportunity.

Third, the Strategy should make an effort to estimate the returns to the investments in Component 3, and explain how the loan is going to be repaid. This could, for example, be done by listing the losses incurred by droughts and flooding in the pilot river basins in recent years[35], and showing that an X% reduction in these costs facilitated by the program will be enough to repay the loan within a period of Y years.

Fourth, rather than putting an emphasis on the generation of official, high-resolution climate scenarios for local level adaptation, PNCC and SENAMHI need to highlight the large uncertainty that exists in climate projections and focus on encouraging adaptation to increased climate variability. It is very dangerous to generate an official scenario and work to get this incorporated into local level planning and investments, since this scenario may not play out. It would be much more useful to encourage a comprehensive analysis of all the 17 downscaled GCMs that exist for Bolivia, in order to get an impression of the full range of possible climates that each locality needs to prepare for and possibly rule out some of the models as inadequate for the Bolivian geography. In any case, real data is much more important for investment decisions, so the generation and analysis of real hydrological data is of highest priority.

Fifth, in Component 1, the Strategy mentions support to improving the web site of SENAMHI. This web site is very important for users of all kinds, so although it is already working quite well and contains a wealth of information, it is worth setting aside resources for this. The strategy does not mention the web site of PNCC, however, and this site is badly in need of improvement.

Sixth, one of the indicators for Component 2 is a reduction in the demand for water in La Paz and El Alto, as expressed by a 7% reduction in billing by the 5th year (p. 61). This seems unrealistic and not advisable, since Bolivians are currently using only a third of the recommended daily minimum domestic water use of 100 liters per day per person[36]. In order to reach the levels needed for optimal health and hygiene, the demand should increase rather than decrease. Thus, rather than counting on a decrease in demand, the Strategy should plan for an additional expansion of supply.

Seventh, although the gender analysis is a donor requirement, it would be useful if the Strategy could provide an estimate of the additional costs this gender focus would imply and explain what the benefits would be.

Finally, no timeframe is presented anywhere in the Strategy.

[35] A municipal level data base of damages from El Niño and La Niña events during the 2006-2008 was created for the "Plan Nacional de Rehabilitación y Reconstrucción." This information is available from VIPFE.
[36] International recommendation by Falkenmark & Widstrand (1992). See Bolivia analysis in ERECC Agua BID (2010).

ANNEX 10: Response to the Independent Technical Review

Independent review recommendations (Annex 9)	Comments and resulting modifications in the document
First, since the main objective of the PPCR is to integrate climate resilience into development planning, the Ministry of Development Planning should be more involved in this program and receive training just like PNCC and SENAMHI. VIPFE, for example, has to approve all public investments in Bolivia, so it would be good if the staff received training that would qualify them to judge whether proposed investments are climate resilient. Strategic Planning staff also needs to be more aware of climate change impacts and strategies to reduce adverse effects. In the current institutional setup, the program is very much concentrated in the Ministry of Environment and Water, which is a good choice as implementing agency, but it should not be limited to that. The proposed institutional setup reflects the widespread perception in the Government that climate change is mainly an environmental problem, while in reality it is a development and planning problem.	The Ministry of Planning will take part in the proposed PPCR Steering Committee through its Vice Ministry of Planning and Coordination. To strengthen the role of the Ministry of Planning in climate change as recommended by the reviewer, an additional activity was included as part of Component 1, sub-component 2 to enhance the capacities of the Ministry of Planning and its Vice Ministries, VIPFE and VPC to respond to climate change through analysis of best practices and lessons learned in other countries on how climate resilience is considered in public investment planning, proposal for modifications of present procedures and awareness building and training on the new procedures.
Second, it is important that the Strategy explains how it envisions its transformative impact to take place, especially considering the temporary character of the National Unit of Program Coordination (UNCP) and the ad hoc advisory committee. It would be good if the Strategy could propose a way to overcome PNCC's current weaknesses and thus contribute to a real institutional strengthening, as this program (at least Component 1) ideally should be managed by a permanent government institution with the mandate of promoting climate change adaptation. Since climate change is really a development and planning problem, it would greatly advance the main objective of the PPCR if PNCC could be moved back to the Ministry of Development Planning, instead of languishing under an environmental viceministry, and the Strategy could try to open a door for that opportunity.	PNCC will take part of in the project steering committee. The PNCC will be strengthened through the following activities: (i) The development of a five-year plan based on a thorough evaluation of the PNCC and lessons learned from implementation of the MNACC; (ii) The mid-term evaluation of the five-year plan defined to verify compliance and make adjustments and improvements arising from the experience in the areas of intervention; (iii) Support to strengthen the website of the PNCC and its accessibility to public sector institutions and the public in general.

Independent review recommendations (Annex 9)	Comments and resulting modifications in the document
Third, the Strategy should make an effort to estimate the returns to the investments in Component 3, and explain how the loan is going to be repaid. This could, for example, be done by listing the losses incurred by droughts and flooding in the pilot riverbasins in recent years[37], and showing that an X% reduction in these costs facilitated by the program will be enough to repay the loan within a period of Y years.	In the preparation process of the three components, economic analyses will be made to ensure that the proposed activities have satisfactory rates of return and benefit profiles. At the moment the information is not yet sufficiently detailed to allow for an economic evaluation. Repayment of the concessional credit will follow the standard terms and conditions outlined in the PPCR guidelines.
Fourth, rather than putting an emphasis on the generation of official, high-resolution climate scenarios for local level adaptation, PNCC and SENAMHI need to highlight the large uncertainty that exists in climate projections and focus on encouraging adaptation to increased climate variability. It is very dangerous to generate an official scenario and work to get this incorporated into local level planning and investments, since this scenario may not play out. It would be much more useful to encourage a comprehensive analysis of all the 17 downscaled GCMs that exist for Bolivia, in order to get an impression of the full range of possible climates that each locality needs to prepare for and possibly rule out some of the models as inadequate for the Bolivian geography. In any case, real data is much more important for investment decisions, so the generation and analysis of real hydrological data is of highest priority.	As the reviewer rightly points out in its report, this activity has been removed from the SPCR.
Fifth, in Component 1, the Strategy mentions support to improving the web site of SENAMHI. This web site is very important for users of all kinds, so although it is already working quite well and contains a wealth of information, it is worth setting aside resources for this. The strategy does not mention the web site of PNCC, however, and this site is badly in need of improvement.	As recommended, we have added an activity to strengthen PNCC website.
Sixth, one of the indicators for Component 2 is	Resilience is achieved through potential

[37] A municipal level data base of damages from El Niño and La Niña events during the 2006-2008 was created for the "Plan Nacional de Rehabilitación y Reconstrucción." This information is available from VIPFE.

Independent review recommendations (Annex 9)	Comments and resulting modifications in the document
a reduction in the demand for water in La Paz and El Alto, as expressed by a 7% reduction in billing by the 5th year (p. 61). This seems unrealistic and not advisable, since Bolivians are currently using only a third of the recommended daily minimum domestic water use of 100 liters per day per person[38]. In order to reach the levels needed for optimal health and hygiene, the demand should increase rather than decrease. Thus, rather than counting on a decrease in demand, the Strategy should plan for an additional expansion of supply.	increases in supply or by reducing overall demand. This indicator is aimed at measuring the contribution of the action plan to reduce the overall demand for potable water in El Alto and La Paz. A different indicator to measure the overall water efficiency is the unaccounted for water index, a well-known and used indicator in the water supply and sanitary sector. Given that the unaccounted for water index is already included, the team feels that the contribution of the demand side to the overall resilience is already being monitored. Therefore, the indicator is dropped. **In the text:** This indicator has been deleted.
Seventh, although the gender analysis is a donor requirement, it would be useful if the Strategy could provide an estimate of the additional costs this gender focus would imply and explain what the benefits would be.	We consider including gender considerations within the M&E, consultations and in some cases project design can be done with very low and, in some cases, no additional cost.
Finally, no timeframe is presented anywhere in the Strategy.	We have included a timeframe in in the Summary template

[38] International recommendation by Falkenmark & Widstrand (1992). See Bolivia analysis in ERECC Agua BID (2010).

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Estado Plurinacional de Bolivia

Ministerio de Planificación del Desarrollo

Viceministerio de Inversión Pública y Financiamiento Externo

La Paz, 18 OCT 2011
MPD/VIPFE/UNF-000683/2011
049732

Ms.
Patricia Bliss-Guest
PROGRAM MANAGER
CIF ADMINISTRATIVE UNIT
1818 H Street NW
Washington, D.C. 20433

Ref.: SUBMISION OF BOLIVIA´S STRATEGIC PROGRAMME FOR CLIMATE RESCILIENCE (SPCR)

Dear Ms. Bliss-Guest,

I am writing on behalf of the Government of the Plurinational State of Bolivia in order to put under consideration of the Pilot Program for Climate Resilience (PPCR) Subcommittee Bolivia´s Strategic Programme for Climate Resilience (SPCR), further requesting its endorsement with the aim of accessing funds of up to USD110,000 million of concessional financing from the Climate Investment Funds, particularly the PPCR as a participant country.

In this regard, I would like to request that the attached SPCR document can be circulated among PPCR Subcommittee members in due course.

I take this opportunity to express my highest considerations.

Yours truly,

Lic. Viviana Caro Hinojosa
MINISTRA DE PLANIFICACIÓN
DEL DESARROLLO

ANNEX 11
PHASE I CONSULTATIONS

LIST OF PARTICIPANTS IN THE CONSULTATIONS UNDER THE PPCR

CONSULTATIVE PROCESS TO PREPARE THE PROPOSAL FOR BOLIVIA'S PPCR – PHASE I

PARTICIPANTS IN THE REGIONAL EVENT IN SANTA CRUZ FOR THE DEPARTAMENTS OF BENI, PANDO, TARIJA AND SANTA CRUZ (October 28-30, 2009)

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(La Paz, February 18-19, 2010)

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Universidades	12	30	5
Ministerios	20	22	54
Prefecturas / Municipios	1	7	8
ONG	17	35	11
Organizaciones sociales	2	7	2
TOTAL	52	101	78

ANNEX 12

PHASE II NATIONAL CONSULTATIONS

CYCLE OF EVENTS "MOBILIZED BOLIVIA IN FACE OF CLIMATE CHANGE":
IMPACTS, VULNERABILITY TO CLIMATE CHANGE, AXIS OF ACTIONAND AREAS OF INTERVENTION
(La Paz, November 23-24, 2010)

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Cooperación	18
Medios de Comunicación	3
Otros	41
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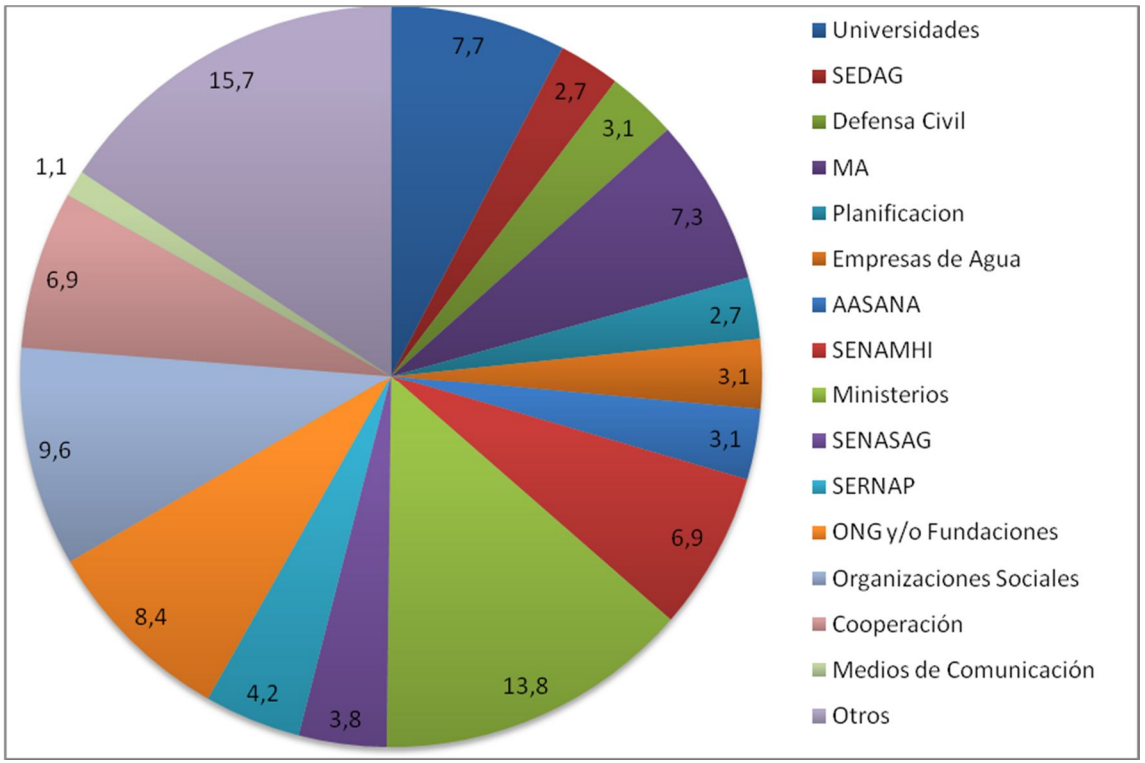

WORKSHOP: DISSEMINATION AND TECHNICAL MONITORING OF PROGRESS
" PROPOSALSOF SECTORAL ACTIONS FOR ADAPTATION AND CLIMATE RESILIENCE"
(La Paz, December 15, 2010)

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ANNEX 13

SECTORAL CONSULTATIONS

SECTOR WORKSHOP: RELATIONSHIP BETWEEN THE EFFECTS OF CLIMATE CHANGE AND THE AGRICULTURAL SECTOR (La Paz, September 9, 2010)

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2.	Eleodoro Baldiviezo	PROSUCO	Resp. General	670-65035		ebaldiviezo@gmail.com
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11.	Erika Cruz	MDRyT - UCR	Técnico I	211-1103		
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15.	Yugar Mayra	UMSA	Estudiante		701-52732	mmaysa-17@hotmail.com
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18.	Lisette Kattya Martínez	Agronomía UMSA	Estudiante		601-78364	lizettmartinez@live.com
19.	Yasminka Tito Bustillos	UMSA	Estudiante	2824821	730-72557	yasminka_1988@hotmail.com
20.	Fernando Espinoza Alvarez	UMSA	Estudiante	2821876	60510165	eaf_fer@yahoo.com
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24.	Samuel Huallpa	GDLP-DSACC	Encargado	76714016	725-76587	sam_tdgl50@yahoo.com
25.	María López	Mision Alanca	Resp. Prog.	2860517		altonorte@manb.org
26.	José Beltrán	UCB - UAC	Director de Carrera		719-47705	josebeltran69@hotmail.com

27.	David Cruz Choque	UMSA	Dirección de Carrera		706-85584	davidcruzchoque@yahoo.com
28.	Bernardo Ticona	MDRyT UCR	Consultor		732-85297	berticona@hotmail.com
29.	Rubén Quispe	UMSA	Universitario		765-44531	ruben.rqa@hotmail.com
30.	Grover V. Mamani	CARE	Consultor		715-78798	agrovermamani@gmail.com

ANNEX 14
REGIONAL CONSULTATIONS

CONSULTATION WITH KEY STAKEHOLDERSIN EL ALTO
(Suriquiña, July 24, 2011)

No.	Nombres y Apellidos	Institución	Cargo	No. Fono ó Celular	Correo Electrónico	Firma
1.	Casimiro Ticona Mamani	Comunidad Cullucachi	Strio. General	412635		
2.	Paulino Hidalgo Parí	Comunidad Corque Amaya	Strio. Relación Sub. Central Are	765-78887		
3.	Florentino Alanoca	Lgachi	Sub. Central Kaza	767-04057		
4.	Victor Chuima Pachuri	Chijjipata Alto	Strio. General			
5.	Clemente Hicana Condori	Caluyo	Strio. General	712-50486		
6.	Esteban Tacachuri					
7.	Tiburcio Ticona Quispe	Parivi	Strio. General Sub. Central	712-23615		
8.	Víctor Luis Lacota	Corque Amaya	Strio Vocal	772-20024		
9.	Toribio López M.	Chirapaca	Strio. de Riego	715-78105		
10.	Pedro Vega Ríos	Chirapaca	Strio. de Actas	772-762293		
11.	Gregorio Alvarez Calisaya	Chirapaca	Strio. de Justicia			
12.	Teodoro Laruta A.	Corque Amaya	Sub. Central Sehuenca	752-62864		
13.	Germán P. Yujra Ch.	Karhiza	Strio. General Sub. Central Karuiz	777-80284		
14.	Anaslito Calcina	Nargas				
15.	Nicolás Quispe Mamani	Katacora	Educación Bartolina Sisa			
16.	Juana Mendoza de Quispe	Chiraka	Comité de Agua	740-33681		
17.	Ersata Condori Mijiya	Cudusuma	Comité de Agua			
18.	Gerbasiz Machaca Alanoca	Cudusuma	Comité de Agua			
19.	Norberta Apaza Gutiérrez	Suriquiñia	Stria. Hacienda			
20.	Lucia Calumania Rojas	Suriquiñia	Comité de Agua			
21.	Alberto Apaza	Ichurasa				
22.	Marcos Quispe	Ichurasa				
23.	Braulio Vargas	Ichurasa				
24.	Benedicto Laura Gutiérrez	Suriquiñia	Comité de Agua			
25.	Walter Sangalli Siñani	Cutsuma	Comité de Agua			
26.	Clemente Mamani	Calasaya	Comité de Agua	762-55971		
27.	Dionisio Churi Churi	Chijipata	Comité de Agua			
28.	Isabel Quispe Patty	Chuipata	Comité de Agua			
29.	Francisco Alvarez		Comité de Agua	670-63170		
30.	Petrona Mamani Turicani	Carhuisa	Strio. Relación			
31.	Maria Mamani	Carhuisa	Stria. de Prensa y Propaganda			

32.	Tomas Corazón		Secretario General	712-70229		
33.	Dionicio Alanoca	Chavez	Strio. Relación			
34.	Beatriz Mamani	Karvisa	Juez de Agua			
35.	Julian Quispe	Karvisa	Juez de Agua			
36.	Julian Quispe	Karvisa	Juez de Agua Local			
37.	Norberta Quispe	Suriquiñia				
38.	Rosmery Quispe Quispe	Suriquiñia				
39.	Martha Vargas Machaca	Suriquiña				
40.	Lidia Choquehuanca	Suriquiña	Representante Riego			
41.	Alejandra Olivares	Cherapaca	Strio. de Deportes Agrario	712-87367		
42.	Rosmery Copa Bustos	Catacora	Strio. Vocal Agrario	712-62208		
43.	Filiberto F. Flores	Chiripaca	Strio. Actas	772-05397		
44.	Hermogenes Fernández	Pariri	Strio. Ganadería	712-58598		
45.	Gumercindo Callisaya	Pariri	Comité de Agua	762-37355		
46.	Siñani Mamani	Galasaya	Comité de Agua	2060883		
47.	Gonzalo Patty	Cullucachi	Sub Central	775-08132		
48.	Pedro Ticona	Cullicachi		399567		
49.	Jacinto Quispe	Suriquiña	Strio. Actas	719-80502		
50.	Paulina Ticona de Flores	Suriquiñia				
51.	Martha Siñani de Condori	Huayrocoudo	Presidenta	777-84853		
52.	Lucia Reas Porce	Huayrocoudo	Stria. de Hacienda			
53.	Máximo Apaza Pari	Corque Amaya	Stria. Vocal Central Agraria	4118374		
54.	Juana Condori Mayta	Coquecanaya	Strio. de Actas	719-45476		
55.	Fortunata Quispe Gutierrez	Suriquiñia				
56.	Saturnina Laime	Suriquiñia				
57.	Macario Aruquipa T.	C. Huayrocondo	Strio. de Actas	737-10257		
58.	Celestino Quispe	Corque Amaya	Strio. Agricola	2483874		
59.	Margarita Mamani	Catacora	Juez de Agua			
60.	Graciela Patty	Cullucachi	Comité de Riego			
61.	Lucia Alanoca	Catacora	Stria. de Relaciones			
62.	Damiana Balboa	Catacora	Stria. de Hacienda			
63.	Justina Quispe	Catacora	Stria. de Vialidad			
64.	Benedicta Aduviri	Catacora	Stria. de Agricultura			
65.	Isidoro Gecon	Suriquiña				
66.	Eulogio Ticona	Jichurasi				

67.	Adolfo Quispe	Jichurasi	Presidente Agua y Luz			
68.	Gregorio Flores	Suriquiña				
69.	Demetrio Flores	Suriquiña				
70.	Alejandro Beltran	Suriquiña				
71.	Eugenio Vargas Flores	Suriquiña	Secretario de Actas	719-63782		
72.	Damiana Gutiérrez de Laura	Suriquiña	Vocal UMATA			
73.	Felipa Condori Flores	Suriquiña				
74.	Gerrero de Vargas	Suriquiña	Sub. Central Agraria			
75.	Rómulo Poma Flores	Suriquiñia	Strio. de Hacienda			
76.	Meleciu Mamani Mamani	Karhuiza	Strio. de Educación	762-96716		
77.	Eusebio Ticona Flores	Karhuiza	Strio. de Deportes	720-75356		
78.	Alberto Gangalli	Chijipata	Strio. Agropecuario	605-64784		
79.	Wilma Calcina Mamani	Calasaya	Strio. de Educación	775-37774		
80.	Basilia Mamani	Calasaya	Agua Comité			
81.	Sabina Condori Mayta	Cotiamaya	Strio. de Justicia	777-21319		
82.	Rufina López Alvarez	Chiripaca	Strio. General	748-66822		
83.	Santusa Tacachira	Kutusuma	Stria. de Justicia			
84.	Teofilo Machaca de López	Chiripaka	Comité Agua			
85.	Ascencio Calcina Apaza		Strio. de Relación	719-18995		
86.	Mario Patty Condori		Strio. General Central Agrario	796-07316		
87.	Ricardo Mamani	Suriquiña				
88.	Pedro Guerrero Yauli	Suriquiña	Strio. General	791-15067		
89.	Viviana Gutierrez Gutierrez	Suriquiña	Strio. de Actas	788-31458		
90.	Limachi	Suriquiña				
91.	Pablo Machicado	Suriquiña				
92.	Juan Flores	Karhuisa	Strio. Vocal			
93.	Secundino Vargas	Jechurasi	Strio. de Actas	777-56577		
94.	Mario Flores Apaza	Jechurasi	Strio. de Actas	752-55601		
95.	Bruno Quinfe			2241021		
96.	Casilda Rivero	Stria. de Actas	Suriquiñia			
97.	Leoncia Laura Mamani	Bartolinas	Strio. Relacion	725-63789		

CONSULTATION WORKSHOP FOR THE SPCR PHASE II:PIRAÍ RIVER SUB-BASIN
(Santa Cruz, September 14, 2011)

No.	Nombres y Apellidos	Cargo	Institución	Localidad	No. Fono ó celular	Correo Electrónico	Firma
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CONSULTATION WORKSHOP FOR THE SPCR PHASE II:MIZQUE RIVER SUB-BASIN
(Cochabamba, September 15,2011)

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19.	Leopoldo Ibáñez	VRHR	Consultor	La Paz	2117391	freddytenorio@hotmail.com	
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21.	Freddy Tenorio	VRHR	Consultor	La Paz	2117391	freddytenorio@hotmail.com	

ANNEX 15
GENDER APPROACH CONSULTATIONS

NATIONAL CLIMATE CHANGE PROGRAM(PNCC, by its Spanish acronym)
WORKSHOP: GENDER AND ADAPTATION TO CLIMATE CHANGE (Cochabamba, March 28, 2010)

No.	Nombre y Apellidos	Organización	Cargo	Lugar de Origen	C.I. / RUN
1.	Mary Arteaga	EMI	Base	La Paz	5959001 LP.
2.	Nadya Alave	EMI	Base	La Paz	62233975 SC.
3.	Ariel Guachalla	EMI	Base	La Paz	6896354 LP.
4.	Rodrigo Villegas	EMI	Base	La Paz	4838044 LP.
5.	José Cortez	EMI	Base	La Paz	6866466 LP.
6.	Carlos de la Rocha	Asociación Inti Illimani	Voluntario de Comunicación	La Paz	2207016 LP.
7.	Katherin Fernández	Asociación Inti Illimani	Apoyo Técnico	La Paz	4266548 LP.
8.	Crisela Villamil	Plataforma	Técnico	La Paz	2717528 LP.
9.	Irma Campo	Viceministerio de Igualdad	Directora General	La Paz	3753699 LP.
10.	Maria Cristina Paraguayo	Bartolinas	Secretaria General	La Paz	2361432 Cbb.
11.	Benedigta Villca	Federación Departamental	Base	Oruro	5742861Or.
12.	Leona Flores	Trabajadoras del Hogar Asal.	Base	Sucre	7528775 Ch.
13.	Alberta Flores	Trabajadoras del Hogar Asal.	Base	Sucre	5621821 Ch.
14.	Esperanta Cuchallo	Bartolinas	Instrumento Político	Cochabamba	3819218 Cbba.
15.	Esperanza Cuchallo	Bartolinas	Instrumento Político	Cochabamba	3819218 Cbba.

No.	Nombre y Apellidos	Organización	Cargo	Lugar de Origen	C.I. / RUN
1.	Elena Alegre Callata	Bartolinas	Miembro Artesanal	La Paz (Inquisivi)	5063222 LP.
2.	Ester Encinas	Federación Departamental	Ejecutiva Departamental	La Paz	2529959 LP.
3.	Donato Duran	Bartolinas	Técnico	La Paz	2294544 LP.
4.	Teresa Soria	Federación Departamental	Base	La Paz	2682890 LP.
5.	Delia Espada	AOPEB	Vocal	La Paz	2642864 LP.
6.	Yola Antiñapa	AOPEB	Base	La Paz	4963080 LP.
7.	Luz Mendoza	FERECO	Base	La Paz	6113272 LP.
8.	Emma Sonco	Federación Regional Chamaca		Sud Yungas	4869994 LP.
9.	Nancy Beatriz Fernández	Bartolinas	Central Agraria	Murillo Achocalla	2690498 LP.
10.	Maribel Marmo Arias	Bartolinas	Presidenta	Abapo Cordillera	4616206 SC.
11.	Clara Mamani	Bartolinas	Secretaria Organozación	La Paz	3494807 LP.
12.	Arrana Agrammont	EMI	Base	La Paz	4761297 LP.
13.	Brigida Guarachi	AOPEB	Presidenta Comisión Mujeres	Taipiplaya La Paz	4987643 LP.
14.	Maribela Lipa Aruq.	Bartolinas	Base	La Paz	2643647 LP.
15.	Paola Zorrilla	EMI	Base	La Paz	4834754 LP.

No.	Nombre y Apellidos	Organización	Cargo	Lugar de Origen	C.I. / RUN
1.	Trinidad Flores	Zuñabi	Secretaria General	Pando Bartolinas	2578454 PN.

2.	Lidia Condori	Bartolina Sisa	Base	Tarija	6757871 TR.
3.	Mariela Aramayo	Bartolina Sisa	Base	Tarija	4123414 TR.
4.	Magdalena Urquiza	Bartolina Sisa	Base	Sucre	7530087 SC.
5.	Dayana López	Bartolina	Base	Tarija	5051982 TR.
6.	Crecenera Llanos	Bartolinas	Base	Tarija	3976769 TR.
7.	Isabel Quispe	Bartolina Sisa	Secretaria de Cultura	Sucre	7480217 Scre.
8.	Olga Bonillas	Bartolinas	Base	Tarija	4148939 TR.
9.	Graciela Aguirre	Bartolinas	Base	Tarija	5057524 TR.
10.	Rufina Apaza	Bartolinas	Base	Tarija	2315614 TR.
11.	Felipa Molina	Bartolinas	Base	Santa Cruz	6289199 SC.
12.	Flora Santillana	Bartolinas	Base	Santa Cruz	6289199 SC.
13.	Gloria Silva	Bartolinas	Representante de Sud Yungas	La Paz	2620490 LP.
14.	Elbertina Condori	Bartolinas	Secretaria Desarrollo Mercado	La Paz	4322679 LP.
15.	Lili Tincuta Limachi	Bartolinas	Secretaria de Hacienda	La Paz	2525723 LP.

No.	Nombre y Apellidos	Organización	Cargo	Lugar de Origen	C.I. / RUN
1.	Gladys Maita	Federación Plan La Paz	Base	El Alto – La Paz	2602728 LP.
2.	Juana Negrete P.	Federación FENCOMIN	Socia cooperativista	La Paz	3108587 OR.
3.	Lucia Marza	Bartolina Sisa	Base	Ovejuyo – La Paz	6729488 LP.
4.	Gladys Sandoval	Bartolina Sisa	Base	Tarija	1874971 TJ.
5.	Yolanda Chávez	Bartolina Sisa	Ej. Provincial de Omasuyos	Omasuyos Achacachi Belen	3409753 LP.
6.	Angelina Loayza	Bartolina Sisa	Ej. Cantonal	Provincia Omasuyo sector Lago	2319797 LP.
7.	Liliana Menar	EMI	Base	La Paz	4979386 LP.
8.	Sheyla Colodro	EMI	Base	La Paz	6836527 LP.
9.	Jorge Cabrera	EMI	Base	La Paz	4979386 LP.
10.	Maria Flores	Bartolina Sisa	Técnico	La Paz	3462235 LP.
11.	Delia Quispe	Bartolina Sisa	Base	Prov. Poopo - Oruro	5734272 LP.
12.	Arminda Soto	Bartolina	Base	Sur Carangas Oruro	3547172 OR.
13.	Florinda Iñiguez	Bartolina	Secretaria Organizacional	Sur Carangas Orinoca	609036 OR.
14.	Zenobia Mamani	FENATRAHOB	Secretaria de Relaciones	Cochabamba	5919472
15.	Maria Beatriz Flores	FENATRAHOB	Base	Cochabamba	

No.	Nombre y Apellidos	Organización	Cargo	Lugar de Origen	C.I. / RUN
1.	Pamela Iriondo	Mocusabol	Base	Coroico – La Paz	6953450 LP.
2.	Mirna Lorena Barra	Mocusabol	Vice - Presidente	Coroico – La Paz	6737278 LP.
3.	Yudid Iriondo Torres	Mocusabol	Base	Coroico – La Paz	6198713 LP.
4.	Coral Sorzano Ortiz	Mocusabol	Base	Coroico – La Paz	6175564 LP.

5.	Viviana Miranda	Mocusabol	Base	Coroico – La Paz	5990646 LP.
6.	Teresa Rodríguez	Bartolina Sisa	Base	Tarija	1649914 TJ.
7.	Antonia Cabrera	FSUMCAS	Base	Villa Candelaria	1396102 Pto.
8.	Marisol Salvatierra	FSUMCAS	Secretaria de Hacienda	Agua de Castillo	8538800 Pto.
9.	Lucy V. Ortega	Bartolina Sisa	Conflicto	Santa Cruz	7765135 SC.
10.	Margarita Muñoz	Bartolina Sisa	Base	San José	3610766 SC.
11.	Dionicia Galarza	Bartolina Sisa	Central	Villa Esperanza	5831384 SC.
12.	Teresa Sandoval	Bartolina Sisa	Presidenta	Portachuelo	3936744 SC.
13.	Ana Villarroel	27 de mayo Bartolinas	Base	San Pedro	3852057 SC.
14.	Lucia Mamani	Federación Plan La Paz	Vocal	Provincia Ingavi	3423827 LP.
15.	Rosa Sánchez	Plan La Paz	Secretaria de relaciones	Provincia Larecaja	249813 LP.

No.	Nombre y Apellidos	Organización	Cargo	Lugar de Origen	C.I. / RUN
1.	Javier Oropeza	PNCC	Consultor	La Paz	2338712
2.	Emilia Quispe Vargas	Cochabamba Federación B.S.	Delegado COD	Cochabamba	3814398
3.	Dora Quispe	E.B.S.		Oruro	634951
4.	Gaby Achocalla	FDMCOOBS	Secretaria de Actas	Oruro	3502710
5.	Sabina Orellana	PNMCIOB	Secretaria IPSP -MAS	Cochabamba	3584062 Cbba.
6.	Amelia Ticona	FENATRAR	Secretaria Ejecutivo	La Paz	3448540 LP.
7.	Lorna Flores			Cochabamba	4526760 Cbba.
8.	Milena Vaca	Federación Nacional	Ejecutiva	Santa Cruz	1956217 SC.
9.	Claudina Escalante	Bartolinas	Vocal	Potosí	6675952
10.	Ambrosia Mamani	Bartolinas	Organización	Santa Cruz	5394701 SC.
11.	Maria Tuisa	Plataforma		Cochabamba	949997 Cbba.
12.	Margarita Tórrido	FOCMTCA	Secretario General	Cochabamba	3584062
13.	Valeriana Lima	Federación	Ejecutiva	Santa Cruz	8478586
14.	Corina Isabel Rodríguez	Independiente		Cochabamba	4387429 Cbba.
15.	Leonarda Tinta		Ejecutiva	Cochabamba	3569025

No.	Nombre y Apellidos	Organización	Cargo	Lugar de Origen	C.I. / RUN
1.	Juan Carlos Alarcón	CIPCA	Técnico	La Paz	5225672 03
2.	Natalia Comesaña	Visitante		Uruguay	4010573-9
3.	Cecilia Nawar	Visitante		Uruguay	3605589-5
4.	Sebastian Ochoa	Plataforma	Comunicación	La Paz	28710671
5.	R. Martha Arebalo	SCC	Coordinadora Programa	Cochabamba	954727
6.	Magaly Urquidi	CNNCIOBBS	Coordinadora	Cochabamba	954727
7.	Dora Martínez	Bartolinas	Secretaria de Organización de Provincias	Cochabamba	823048
8.	Marlene Quispe	Activistas	Secretaria General	Cochabamba	644969 Cbba.

9.	Maria Andía Hidalgo			Cochabamba	3752352 Cbba.
10.	Faustina Carcillas	FECANTROP	Secretaria de Hacienda	Cochabamba	5661101 Cbba.
11.	Elizabeth Yucra	FECANTROP	Secretaria de Organización	Regional Trópico	7941402 Cbba.

No.	Nombres y Apellidos	Departamento de Procedencia	Numero de Telef./Celular
1.	Sandra Mollo	Potosí	72425422
2.	Elizabeth Yucra Chajmi	Cochabamba (Tropico)	72765574
3.	Lucia Wilma Marza Alvarez	FONCIOLP-BS	76255425
4.	Marisol Salvatierra	Potosí	72367766
5.	Apolonia Sánchez Miranda	Cochabamba	77233652
6.	Hortensia Choque Yahuasi	Cochabamba	70302714
7.	Amalia Coaquia	La Paz - Alianza	71949469
8.	Angelina Loayza de Charca	La Paz	73526456
9.	Faustina Casillas Apaza	Trópico de Cochabamba	72256086
10.	Arminda Doris Soto Magni	FDMCOO. Oruro	73830725
11.	Elena Alegre Callata	La Paz – Inqusivi	
12.	Maria Cristina Paraguayo	FDMCOO. Oruro	71887341
13.	Delia Dora Quispe Sausiri	FDMCOO. Oruro	74506351
14.	Rosa Sánchez Parado	Federación Plane La Paz	70566241
15.	Juvencio Huarachi	Potosí - Uyuni	72559539
16.	Florinda Irtiguez Choque	Oruro - Orinoca	73801621
17.	Valentina Condori López	FDMQOPBS	72432534
18.	Liliana Flores Melendez	Sucre	73422540
19.	Tereza Rodríguez	Tarija	72980074
20.	Dionisia Galarza	Santa Cruz	76090680
21	Savina Orellana Cruz	Cochabamba	72069748
22.	Isabel Arias	Cochabamba	76996588
23.	Teresa Choque	Oruro	71848044
24	Claudina Escalante	Potosí	65752528
25.	Salame Paco Mendoza	Potosí	
26.	Damiana Flores	Cochabamba	71785297
27.	Margarita Muñoz	Santa Cruz	3610766
28.	Emma Sonco	La Paz	4869944
29.	Dolores Muya	Beni	73990122
30.	Juana Negrete Pacheco	La Paz	73274512
31.	Luz Mendoza Quispe	La Paz	60129582
32.	Julia Quispe Parado	La Paz	73832005
33.	Felipa Molina Mollo	Santa Cruz	70784603
34.	Alberta Flores	Sucre	77137605
35.	Elbertina Condori de P.	Bartolina Sisa La Paz	73517727
36.	Roberta Tinta Quiroga	Cochabamba Sipe Sipe	71707157
37.	Delia Espada Rosso	La Paz AOPEB	71955053
38.	Antonia Cabrera	Potosí FSUMCAS “BS”	7335988

39.	Giovana Vargas Morales	Cochabamba	76224603
40.	Olivia Reyes García	Cochabamba	76908563
41.	Sabina Montaño Mejia	Cochabamba Punata	76484988
42.	Emilia Arizpe Vargas	Bartolina Sisa Cochabamba	71415274
43.	Olimpia Pereira	Bartolina Villa Rivero	76924643
44.	Hermogena Calderón	La Paz	71983668
45.	Rufina Apaza	Tarija – B.S	2315614
46.	Lucia Mamani de Quispe	La Paz- Alianza CNMCIOBBS	72513564
47.	Brigida Huarachi	La Paz- Alianza CNMCIOBBS	71986221
48.	Esther Encinas Balderrama	La Paz	70636883
49.	Neli Maleca Vidal	Beni	72178535
50.	Bernardina Mamani Parí	Cochabamba	
51.	Nancy Beatriz Fernandez	La Paz	70576323
52.	Clara Mamani	La Paz Inquisivi	71262675
53.	Maria Flores Jiménez	La Paz	70358787
54.	Severina Parí Aguayo	Cochabamba	
55.	Claudia Bustamante	Beni	72087664
56.	Yolanda Chávez de León	La Paz Provincia Omasuyus	70696687
57.	Flora Santillana Choque	Santa Cruz	79833190
58.	Dora Martínez	Cochabamba	
59.	Consuelo Escobar M.	La Paz	71910091
60.	Magaly Maqueda	CNMCIOB “BS”	77405209
61.	Claudia Bustamante	Beni San Borja	72078664
62.	Ana Gabriela Sánchez Mita	Tupiza Potosí	70116566
63.	Paola Andrea Morales Chávez	La Paz Apoyo EMI	72085668
64.	Ariana Cindy Agramont Carpio	La Paz Apoyo EMI	60122246
65.	Stephany Lindsay Fernandez Silva	La Paz Apoyo EMI	73294707
66.	Rodrigo Villegas Godoy	La Paz Apoyo EMI	70152617
67.	Maribela Lipo Aruquipa	La Paz Bartolina Sisa	72038605
68.	Lily Tinenta Limachi	La Paz Bartolina Sisa	76746465
69.	Gladys M. Sandoval Salgado	Tarija - Cochabamba	72940199
70.	Valentina Condori	Potosí	72432534
71.	Amelia Ticona Vergara	La Paz	77769987
72.	Berna Dayana López Aleto	Tarija	74535754
73.	Teresa Sandoval Peña	Santa Cruz	76090680
74.	Graciela Aguirre Vargas	Tarija	74543542
75.	Trinidad Flores Zúñiga	La Paz	71902554
76.	Mirna Barra Barra	La Paz	71282883
77.	Mariela Zenobia Aramayo	Tarija	

78.	Yudid Iriondo Condori Torres	La Paz	72596061
79.	Pamela Iriondo Condori	La Paz	70576069
80.	Ana Villarroel Castro	Santa Cruz	77089675
81.	Coral Sorzano Ortiz	La Paz	77786845
82.	Crecencia Llanos Choque	Tarija	72953466
83.	Lucy Victoria Ortega	Santa Cruz	
84.	Lidia Condori Condori	Tarija	71190888
85.	Olga Bonillos Lizarhaga	Tarija	71191139

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	C.I.	Nombre y Apellido	Cargo	Entidad/Organización de Procedencia	Telefono
1	8095638 Scz	Adela Paniagua Cuellar	Base	Intercultural	77023079
2	2448246L.p.	Adela Baltazar Quelca	Lider	CONAMAQ	
3	3012472 Cbba	Alberta Caisari Condori	Ejecutiva Bartolina Sisa	GRAN CHACO BARTOLINA SISA	71897818
4	3493584 L.P.	Alicia Carmen Tola	Vocal	Intercultural	
5	8572915 Po.	Alicia Alejo Paucara	Organizacion	Trabajadoras por cuenta propia	73870077
6	3098355 OR	Arminda Condori Mamani	Vocal	Bartolina Sisa	
7	5941160 L.P.	Arminda Apaza P.	Stria. Ejecutiva B.S. Kaloque	Bartolina Sisa	77752135
8	2361432 L.P.	Amalia Coaquira Calani	Presidenta	CONTCUPB	71902456
9	3950681 SCZ	Angela Flores Tejerina	Vicepresidenta	Cuenta propia	
10	4368944L.P.	Ana Maria Baltazar	S. de hacienda	Trabajadoras por cuenta propia	79444848
11	3981072 PO.	Benigna Figueroa Puma	Presidenta	Bartolina Sisa L.P.	71929470
12	6579867 PO.	Betty Machaca Choque	Porta Estandarte	Trabajadoras por cuenta propia	74812152
13	2445147 LP.	Brigitte Esacalante Quint	Stria. Formación Socio Político Pastoral	Organización Matriz de Mujeres "Juana Azurduy de Padilla"	
14	2564107 LP.	Catalina Carrillo	Stria. Ejecutiva B.S. Kaloque	Bartolina Sisa	77752135
15	2692006 L.P.	Ceferina Barrera Ramirez	Base	Julian Apaza Nina	7329757
16	1423856 PO	Ceferina Anagua G.	Sec. ejecutiva	CMCIOA BS	73897157
17	4301217 LP.	Claudia Luisa Pinto Colque	Stria. General	Trabajadoras por cuenta propia	72371218
18	3202290 SCZ	Cristina Albino Arancibia	1er Vocal	Bartolina Sisa	72736024
19	5649652 Ch.	Demetria Juarez Piñas	Sec. ejecutiva	Bartolina Sisa	
20	1325079 PO.	Dionici Choque	Base	Juana Azurduy	72411179
21	3973423 PO.	Dionicia Beatriz Jallaza	Base	Bartolina Sisa	
22	2564405 LP.	Doris Cobo	Mama T'alla de Proyecto	CONAMAQ	78764455
23	6187917 LP.	Elsa Apuri Limaco	Ejecutiva prov. Abel Iturralde	Bartolina Sisa	74523092
24	1304190 PO.	Elsa Fuertes Choque	Base	Trabajadoras por cuenta propia	6228754
25	382818 LP.	Elsa Mollo Calle	Area 4	FAIMIC Federacion	

26	7028214 LP.	Eleoteria Aguilar Chambi	Stria. General	Colquiri Inquisivi	
27	6718458 PO.	Eliza Cardenas Trujillo	Area 4	FAIMIC Federacion	73706790
28	8289954 LP.	Elizabeth Aguada Manu	Base	Bartolina Sisa	
29	8927625 SCZ	Elizabeth Gonzales	Dirigente	Trabajadoras por cuenta propia	72170583
30	9269251 BE	Emilse Sanjinez	Base	Bartolina Sisa	
31	8406865LP.	Esther Duri Mamio	Secretaria org. Abel Iturralde	Bartolina Sisa	67277709
32	3962997PO.	Erminia Colque Calle	Sec. Organizacion	Fed. PLANE	77308461
33	6570176 PO.	Epifania Mamani	Base	Juana Azurduy	70470437
34	7609780 BE.	Eva Cartagena Cavinas	Mama T'alla de Proyecto	CONAMAQ	78764455
35	6880394 LP.	Exalta Quispe	Stria. General	Colquiri Inquisivi	
36	2670371 LP.	Felicidad Yugar Loayza	Base	Bartolina Sisa	
37	5074116 PO.	Feliciadad Mallcu Colque	Secretaria de Actas	CMCIOA BS	72475703
38	2194954 LP.	Florentina Apaza Paye	Base	Bartolina Sisa	
39	6876313 LP.	Florencia Condori	Sec. Acta	FEDELPAZ	
40	6036576 LP.	Florencia Cuentas Chura	Base	Plane	
41	5950790 LP.	Francisca Salez Quisbert	FAECIMAB	CMI intercultural	67329163
42	4854033 LP	Francisca Pairo Mamani	Base	FEDELPAZ	
43	3695360 PO	Francisca Flores	Base	Juana Azurduy	
44	9956985 LP.	Gladys Mamani	Base	Bartolina Sisa	77204067
45	5470855 L.P.	Gertrudis Conde Apaza	Ejecutiva de Mujeres Area 5	Interculturales	73231770
46	1687137 BE.	Herminia Calama Moriba	Base	Bartolina Sisa	67057950
47	6867679 LP.	Hortencia Mamani	Educación	Bartolina Sisa	67122571
48	7732728 SCZ.	Isalda Sanchez	Base	Bartolina Sisa	
49	2551706 LP.	Isabel Mamani	Base	Bartolina Sisa	
50	4747222 LP.	Isabel Ajhuacho Condo	Stria. Actas	O.M.M El Alto Juana Azurduy	
51	7684656 SCZ	Isabel Chore	Base	O.M.M El Alto Juana Azurduy	
52	6368326 SCZ	Isabel Vargas	Base	Juana Azurduy	67989951
53	4926515 LP.	Jakelin Limachi V.	Voluntaria	CEPROSI	
54	1685047 BE	Juana Lucia Camaconi	Base	Bartolina Sisa	
55	9011380 SCZ	Juana Janko Mendez	Presidenta	Mujeres Musicos	
56	2152548 L.P.	Juana Quispe Castaño	Vocal	Plane	75272958
57	2304127 LP.	Juana Velasco	Presidenta	FEDELPAZ	71936665

58	4858574 LP	Julia Choque	Sec. Genero	FEDELPAZ	79593921
59	7732778 SCZ.	Julia Flores Chore	Base	Bartolina Sisa	
60	4940254 LP.	Juana Gutierrez	Base	Bartolina Sisa La Paz	
61	1374125 PO.	Julia Nava Condori	tecnica	Cuenta propia	70655849
62	10707493 TJ.	Juana Coaquira Calani	Dirigente	Trabajadoras por cuenta propia	
63	9231087 LP.	Justina Arismendi	Sec. Ganadero	FEDELPAZ	73254505
64	23211079 LP.	Justina Apaza Humiri	Vocal	PLANE	77266099
65	9946778 LP.	Jhoselin Perez Bustamante	Base	Julian Apaza Nina	79639608
66	6180853 LP.	Karen Renjifo Tambo	Base	Bartolina Sisa	
67	5623248 BE.	Laida Yaneth Torrez Ruelas	Secretaria de Actas	Bartolina Sisa	74752570
68	7191396 TJ.	Laura F. Perez	Base	CONTCUPB	70226206
69	273470 L.P.	Leonor Mallcu	Mama T'alla	CONAMAQ	72772152
70	9677701 SCZ	Leocadia Espinoza	Base	Juana Azurduy	
71	602558 OR.	Leonor Cucho	Base	Juana Azurduy de Padilla	
72	3911552 SCZ.	Lidia Almazan	Base	Bartolina Sisa	
73	2718017 LP.	Lola Manrrique Ortega	Vocal	PLANE	
74	6237368 SCZ.	Lorenza Tolaba	Base	Bartolina Sisa	
75	3781559 CB.	Lucia Terrazas Cardenas	Base	Juana Azurduy	
76	6121408 LP.	Lumbre Fernandez	Central de Mujeres	La Paz Interculturales	
77	2465511 LP.	Lucia Apaza Tola	Base	Bartolina Sisa	
78	6189478 LP.	Lupe Masias Mamani	Central de Mujeres	La Paz Interculturales	
79	2275783 LP.	Luisa Mamani	Central de Mujeres	La Paz Interculturales	
80	6168943 LP.	Luisa Concha	Sec. Genero	FEDELPAZ	60107214
81	3433043	Ibertina Gorques	Secretaria Ejecutiva	FEMSICAR	73003734
82	602558	Leonor Cucho	Base	Juana Azurduy de Padilla	
83	273470 L.P.	Leonor Mallcu	Mama T'alla	CONAMAQ	72772152
84	2734704	Leonor Mallku M.	Mama T'alla	CONAMAQ	71772152
85	2350244	Lidia Eryla			
86	7647150	Lilibeth Moreno A	Base	Bartolina Sisa	
87	3055212	Linbu Madreno	BIS RSS	BS R Sipe Sipe	65702565
88	5071125	Lorenza Quispe	Sec. organizacion	CNMCIOB BS	67084427
89	4307415 L.P.	Lucrecia Huayhua Choque	Lidereza	Bartolina Sisa	73226977

90	6168943	Luisa Concha	Sec. Genero	FEDELPAZ	60107214
91	2275783 L.P.	Luisa Mamani	Central de Mujeres	La Paz Interculturales	71987423
92	QA373114	Luna Begin	Voluntaria	CEPROSI	67057950
93	1928511	Lupe Antelo P.	Base	Bartolina Sisa	
94	6113272 L.p.	Luz Jhovana Mendoza Quispe	Base	FERRECO	75801437
95	QA321228	Mara Messier Peet	Voluntaria	CEPROSI	67057950
96	10844003	Marcial Pilar	Secretaria	Trabajadoras por cuenta propia	67282295
97	1433230	Margarita Alcoba	Secretaria General	Trabajadoras por cuenta propia	76171249
98	9182240	Maria Calisaya	Secretaria de Actas	FEMCICAR	73001904
99	3489017	Maria del C. Pachi	Facilitadora	Juana Azurduy de Padilla	
100	3797865	Maria leancho	Base	Trabajadoras por cuenta propia	
101	1681154	Maria Luz Arana Sanguino	Base	Bartolina Sisa	71120555
102	4927805	Maria Vargas Sandoval	Responsable Escuela lideres	CEPROSI	73548839
103	7500297	Marlene Vedia	Organización	Bartolina Sisa	73451484
104	5181133	Marta Limachi	Base	Bartolina Sisa	7432163
105	6859264	Marta Tola	Sec. Hacienda	FEDELPAZ	
106	2391839	Martha Gavidra	Escuela lideres	CEPROSI	76511283
107	3455751 L.P.	Martha Lima	Stria. Técnica	CSMCIB	71939621
108	3684015 PO.	Martha Villca Flores	Potosí	Trabajadoras por cuenta propia	72445989
109	4539399 CB	Mary Flores O.	Técnica	Programa Bolivia Constituyente	72210965
110	1433193	Mary Mamani Medrano	Sindicato Potosí	Fenatraltob	72430398
111	1912441	Maura Torrez			
112	2681360	Max Silva	Técnica		
113		Melitona Barrios	Representante		73780322
114	2068052	Mercedes Marquez	3 er Ejecutiva	Federacion de mujeres	70151428
115	2599016	Mercedez Fernandez	Strio. Organización	Bartolina Sisa	74056555
116	3706570	Mery Esposo	Base	Juana Azurduy	72442949
117	6641874	Miguel Valencia		Cuenta propia	74234378
118	5500868	Mirtha Caro	Base	Juana Azurduy	70439944
119	4935911	Modesta Guardia	6 de agosto central	FAIMIC Federacion	74081720
120	7048865 L.p.	Monica Alvarado Ramos	Base	FERRECO	67140716
121	QA784581	Mylene Ouellet	Voluntaria	CEPROSI	67057950

122	WA222244	Nargess Mustapha	Voluntaria	CEPROSI	67057950
123	6530464	Natalio Quispe	Ejecutiva	CSMCIB	67080259
124	7908844	Neisa Jaimes V.			
125	8546050	Nelson Mamani	Sullka Wayna	CONAMAQ	72416498
126	2357865 Lp.	Pacesa Aranda Quispe	Vocal	Plane	
127	7193498	Pamela Cari	Base	FDMC	76182562
128	3182483	Pastorista Quispe	Ejecutivo	San Julian	721625031
129	6086956 L.P.	Petronila Mamani Laura	Stria. Relaciones CSMCIB	Interculturales	74072251
130	3181037	Quintana Hullpa	Secretaria General	Intercultural Santa Cruz	67701480
131	2580710	Rajna Chipana	Ejecutiva	FAIMIC Federacion	67081947
132	10033652	Reyna villa	Sec. Acta	FEDELPAZ	75254754
133	2017856 L.P.	Reynaldo Espejo	Consultor		
134	4010067	Rita Ramirez	Base	Trabajadoras por cuenta propia	71814143
135	2283588	Rosa Bustamante	Stria. Hacienda	Julian Apaza Nina	72011068
136	2288083	Rosa Guacara	Secretaria Subcentral	Bartolina Sisa	70678255
137	380382	Rosa M. Paz Tito Ventura	Stria. General	Bartolina Sisa	71911183
138	7661029	Rosa Vargas	Secretaria Ejecutiva	Federacion 4 canadas	76309786
139	1780550	Rosario Arce	Prensa y Propaganda	CSTLFTAGB Red Mujeres	70223740
140	2729318 O.R.	Rosario Pinaecoba	Base	Bartolina Sisa	71920327
141	4906912 L.P.	Rosmery Condori C.	Base	Bartolina Sisa L.P.	73712787
142	5677989 O.R.	Rosmery Llanos Villca	Central Ibavo	Zona Chore	76257385
143	7106998	Roxana Gonzales	Ejecutiva de la central	Bartolina Sisa	74543852
144	274838 O.R.	Roxana Zaconeta	Consultoría externa	VPEP	73066251
145	1752153	Ruby Escalante	Base	Regional Madre de Dios	
146	2587873	S. Alejandra Chacollo	Stria. General	Bartolina Sisa	71263514
147	2711786	Sabina Espinoza	Tribunal H	FMEA	60546806
148	3685662	Sabina Merenda	Base	Trabajadoras por cuenta propia	
149	4308919	Sarah Gutierrez	PNCC	MMAyA	72083656
150	6552122	Seferina Ortega	Ejecutiva	Suna Chore	67503704
151		Senobia Gava	Dirigente		
152	10097786	Silvia Mamani	Sec. Hacienda	FEDELPAZ	74082808
153	70241006780	Silvia Yanett Perez Arias	Base	Juana Azurduy de Padilla	

154	6769494	Simayda Cucho	Central	FAIMIC Federacion	73733746
155	1286354	Sinforosa Dolores	Mama T'alla	CAOC POTOSÍ	
156	5877410	Sonia Dávila	Miembro		
157	3576979	Sonia Ochoa	Dirigente	Cuenta propia	77333494
158	5488530	Teodora Llanos	Sec. Relaciones	Fed. PLANEL SC	77055493
159	1826641	Teodora Llanos V.	Base	Bartolina Sisa	74537192
160	2327842 L.P.	Teresa Quispe de Delgado	Presidenta Bartolina Sisa La Paz	Bartolina Sisa	
161	1381034	Teresa Santos	Mama T'alla	CONAMAQ	67939905
162	2718171	Tola Manriques Oila	Base	Julian Apaza Nina	
163	3493584 L.P.	Tolal Alicia	Base	Julian Apaza Nina	
164	10909279	Trinidad Alarcon	Presidenta	Juana A. S.P.	
165	195711	Valeria Lima	Ejecutiva Nacional	Cuenta propia	77691674
166	5699652	Vernarna suerez	Coordinadora	CUMCIOB BS	72854414
167	6528521	Veronica Juarez P.	Coordinadora	CNMCIOB "BS"	
168	8465658 L.P.	Veronica Sinchi Quispe	Articulacion con Movimientos Sociales	Juana Azurduy de Padilla	
169	3126300	Vicente Mamani	CAIB	Sucre	71168460
170	2853883	Victoria Flores	Base	Juana Azurduy de Padilla	
171	3692368	Victoria Ramirez	Presidenta	Trabajadoras por cuenta propia	73852155
172		Virginia Chinchero	Vocal	FEMCICAR prov. Caranavi	
173	3025866	Virginia Terceros	Prensa y Propaganda	EN B.S.	70730978
174	7654235	Zonia Maito	Vicepresidenta		
175	5034322	Zulma Velasquez	Base	Bartolina Sisa	74525598
176	6189478 L.p.	Lupe Masias Mamani	Base	Plane	
177	7067029L.p.	Yenny Martinez Conde	Vocal	Interculturales	
178	7609780 Be.	Eva Cartagena Cavinas	Base	Bartolina Sisa	
179	5944832L.p.	Yaira Roman de Howard	Base	Bartolina Sisa	
180	6176673L.p.	Sulma Elisabet Salinas	Secretaria	Bartolina Sisa	
181	2853883	Victoria Flores	Base	Juana Azurduy de Padilla	
182	3692368	Victoria Ramirez	Presidenta	Trabajadoras por cuenta propia	73852155
183		Virginia Chinchero	Vocal	FEMCICAR prov. Caranavi	
184	3025866	Virginia Terceros	Prensa y Propaganda	EN B.S.	70730978

185	7654235	Zonia Maito	Vicepresidenta		
186	5034322	Zulma Velasquez	Base	Bartolina Sisa	74525598
187	6189478 L.p.	Lupe Masias Mamani	Base	Plane	
188	7067029L.p.	Yenny Martinez Conde	Vocal	Interculturales	
189	7609780 Be.	Eva Cartagena Cavinas	Base	Bartolina Sisa	
190	5944832L.p.	Yaira Roman de Howard	Base	Bartolina Sisa	
191	6176673L.p.	Sulma Elisabet Salinas	Secretaria	Bartolina Sisa	

FOCUS GROUP WORKSHOP: GENDER AND CLIMATE CHANGE
PIRAÍ RIVER SUB-BASIN
(Santa Cruz, September 14, 2011)

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FOCUS GROUP WORKSHOP: GENDER AND CLIMATE CHANGE
MIZQUE RIVER SUB-BASIN
(Cochabamba, September 15, 2011)

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ANNEX 16
INTERNATIONAL COOPERATION AGENCIES CONSULTATION

MEETING TO PRESENT THE RIVER BASIN MANAGEMENT APPROACH- PPCR PHASE II (SPCR)
(July 27, 2011)

Nº	PARTICIPANTE	INSTITUCIÓN
1	Carlos Ortuño Yáñez	VRHR
2	Luis Marka	VRHR
3	Has Willet	VRHR
4	Álvaro Rodríguez	VRHR
5	Jimy Navarro Scott	VRHR
6	Alfred Grundwalt	BID
7	Sandra Valencia	BID
8	Alejandro Deep	BID
9	Cecilia Aldre	BID
10	Karen Arleth	PNUD
11	Javier Gonzáles	Consultor
12	Daniel Zuazo	PNCC
13	Maria del Socorro Peñaloza	Consultora
14	Jorge Treviño	BM
15	Maria Elena Soria	BM
16	Morten Blomqvist	BM

MEETING WITH REPRESENTATIVES OF THE INTERNATIONAL COOPERATION TO PREPARE THE SPCR
(August and September, 2011)

Fecha	Institución	Representante	Aspectos Relevantes
3 – 8-11	Plan Nacional de Cuencas/VRHR	Has Willet	Intercambio de ideas, material y aspectos relevantes a enfatizar en el SPCR. Enfoque de género
28 -8-11	Banco Mundial	Morten Blomqvist	Presentación de antecedentes del PPCR y estado de situación. Enfoque de género
9-8-11	Apoyo Sectorial al PNC	Sohrab Tawackoli	Explicación del ASPNC, PNC1 y PNC2, incorporación de temática de CC al PNC. Enfoque de género en el PNC
12-8-11	Embajada de Los Países Bajos	Rob van den Boom y Jeanette Trujillo	Insumos para SPCR, datos importantes, contactos. Enfoque de género
16-8-11	Embajada de Suecia	Pierre Frühling	Insumos para SPCR, datos importantes, contactos. Enfoque de género
16-8-11	Programa GESTOR/COSUDE	Carlos Saavedra	Información sobre estado de avance del Plan Director de la Cuenca del Río Grande PDCRG, enfoque, visión. Enfoque de género en construcción
17-8-11	PROAGRO/GIZ	Claudia Cordero	Insumos para SPCR, datos importantes, contactos. Enfoque de género
17-8-11	PROAGRO/GIZ	Stephanie Heiland	Insumos para SPCR, datos importantes, contactos. Enfoque de género, entrega de material
18-8-11	Ministerio de Relaciones Exteriores de Bolivia	Ivy Beltrán	Resumen y antecedentes de PPCR Fase I, orientaciones sobre consultas realizadas. Enfoque de género
19-8-11	KfW	Carmiña Antezana	Presentación de proyectos de KfW en las regiones de interés del PPRC, insumos, datos, contactos

MEETING TO PRESENTTHE STRATEGIC OUTLINES OF THE PPCR - INTERNATIONAL COOPERATION
(September 19, 2011)

No.	Nombre	Cargo	Institución	Teléfono /Cel	E-mail
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9.	Cesar Moreno	Oficial Programas	U.E.	2782244	cesar.moreno@eeaseuropa.es
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12.	Maria del Socorro Peñaloza	Consultora	BM	70652882	soco@enbolivia.com
13.	Sebastian Eugster	Director Adjunto	COSUDE	77268764	sebastianeugster@sdc.net
14	Jhonn Gómez	Asesor Político Público	SNV	76797471	jgomez@snvworld.org