Meeting of the Board
13 – 16 March 2023
Songdo, Incheon, Republic of Korea
Provisional agenda item 11

GCF/B.35/02/Add.04

20 February 2023

Consideration of funding proposals – Addendum IV

Funding proposal package for FP202

Summary

This addendum contains the following seven parts:

a) A funding proposal titled "Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)";
b) No-objection letter issued by the national designated authority(ies) or focal point(s);
c) Environmental and social report(s) disclosure;
d) Secretariat's assessment;
e) Independent Technical Advisory Panel's assessment;
f) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
g) Gender documentation.

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Funding Proposal

Project/Programme title:	*Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)*
Country(ies):	*Plurinational State of Bolivia*
Accredited Entity:	*Food and Agriculture Organization of the United Nations (FAO)*
Date of first submission:	*[2021/03/29]*
Date of current submission	*[2022/11/25]*
Version number	*[V.10]*

GREEN CLIMATE FUND

A

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Note to Accredited Entities on the use of the funding proposal template

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the GCF Information Disclosure Policy, project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

Please submit the completed proposal to:
fundingproposal@gcfund.org
Please use the following name convention for the file name:
"FP-[Accredited Entity Short Name]-[Country/Region]-[YYYY/MM/DD]"

LIST OF ACRONYMS

AE	Accredited Entity
AMA	Accreditation Master Agreement
AWPB	Annual Work Plans and Budgets
PDB	Productive Development Bank
EE	Executing Entity
ESM	Environmental and Social Management
FAA	Funded Activity Agreement
FAM	Federation of Municipalities
FINRURAL	Association of Development Finance Institutions
FONABOSQUE	National Fund for Forest Development
FONDESIF	Fund for the Development of the Financial System and Support for the Productive Sector
FFS	Farmer Field School
GAM	Autonomous Central Government
GBV	Gender-based violence
GoB	Government of Bolivia
INSA	National Institute of Agricultural Insurance
INIAF	National Institute of Agricultural and Forestry Innovation
JMAM	Joint Mitigation and Adaptation to Climate Change
MDRyT	Ministry of Rural Development and Lands
MDP	Ministry of Development Planning
MMAyA	Ministry of Environment and Water
M&E	Monitoring and evaluation
PDES	Social and Economic Development Plan
PMC	Project Management Costs
PMU	Project Management Unit
PROFIN	Foundation for Productive and Financial Development
PTDI	Integral Territorial Development Plans
PSC	Project Steering Committee
RLC	Regional Office for Latin America and the Caribbean
SENAMHI	National Service for Meteorology and Hydrology
SEAH	Sexual Exploitation, Sexual Abuse, and Sexual Harassment
TC	Technical Committee
TCOs	Communal lands *(Tierras Comunitarias de Origen)*
TIOCs	Peasant/Indigenous territories *(Territorios Indígenas Originarios Campesinos)*
TOUs	Territorial Operating Units
VIDECI	Vice-Ministry of Civil Defense

A. PROJECT/PROGRAMME SUMMARY

A.1. Project or programme	Project	**A.2. Public or private sector**	Public
A.3. Request for Proposals (RFP)	*If the funding proposal is being submitted in response to a specific GCF Request for Proposals, indicate which RFP it is targeted for. Please note that there is a separate template for the Simplified Approval Process and REDD+.* Not applicable		

A.4. Result area(s)

*Check the applicable GCF result area(s) that the overall proposed project/programme targets below. For each checked result area(s), indicate the estimated percentage of **GCF and Co-financers' contribution** devoted to it. The total of the percentages when summed should be 100% for GCF and Co-financers' contribution respectively.*

	GCF contribution	Co-financers' contribution[1]
Mitigation total	Enter number %	Enter number %
☐ Energy generation and access	Enter number %	Enter number %
☐ Low-emission transport	Enter number %	Enter number %
☐ Buildings, cities, industries and appliances	Enter number %	Enter number %
☐ Forestry and land use	Enter number %	Enter number %
Adaptation total	Enter number %	Enter number %
☒ Most vulnerable people and communities	13 %	21 %
☒ Health and well-being, and food and water security	67 %	55 %
☐ Infrastructure and built environment	Enter number %	Enter number %
☒ Ecosystems and ecosystem services	20 %	24 %

A.5. Expected mitigation outcome *(Core indicator 1: GHG emissions reduced, avoided or removed / sequestered)*	*NA*	**A.6. Expected adaptation outcome** *(Core indicator 2: direct and indirect beneficiaries reached)*	*81,551 direct beneficiaries and 1,251,769 indirect beneficiaries.*	
			81,551 head of households, of which 48%, (39,144) are women, while men account for 52% of the total number of beneficiaries (42,407).	*1,251,769 indirect beneficiaries of which 48% are women, and 52% are men.*
			0.7% of direct beneficiaries vis-à-vis total population, and 5,5 % vis-à-vis total population of the Valleys Macro Region.	*10.7% of indirect beneficiaries vis-à-vis total population and 53.7% vis-à-vis total population of the Valleys Macro Region.*

[1] Co-financer's contribution means the financial resources required, whether Public Finance or Private Finance, in addition to the GCF contribution (i.e. GCF financial resources requested by the Accredited Entity) to implement the project or programme described in the funding proposal.

A.7. Total financing (GCF + co-finance)	63,300,000 USD	**A.9. Project size**	Medium (Up to USD 250 million)
A.8. Total GCF funding requested	33,300,000 USD		

A.10. Financial instrument(s) requested for the GCF funding	*Mark all that apply and provide total amounts. The sum of all total amounts should be consistent with A.8.* ☒ Grant 33,300,000 ☐ Loan Enter number ☐ Guarantee Enter number ☐ Equity Enter number ☐ Results-based payment Enter number

A.11. Implementation period	*5 years*	**A.12. Total lifespan**	*10 years*[2]
A.13. Expected date of AE internal approval	*11/30/2021*	**A.14. ESS category**	B
A.15. Has this FP been submitted as a CN before?	Yes ☒ No ☐	**A.16. Has Readiness or PPF support been used to prepare this FP?**	Yes ☐ No ☒
A.17. Is this FP included in the entity work programme?	Yes ☒ No ☐	**A.18. Is this FP included in the country programme?**	Yes ☐ No ☐ Not applicable since Bolivia does not have a country programme yet. The NDC highlights the need for reducing vulnerability of the water sector and increasing local governance of climate resilient water resource management. This proposal is a priority project that will be articulated as part of the pipeline in the country programme.
A.19. Complementarity and coherence	Yes ☐ No ☒		
A.20. Executing Entity information	FAO will be the sole Executing Entity for the GCF funds. The Government of Bolivia, acting through MMAyA, and the FAM will be Executing Entities, exclusively responsible for the implementation of activities funded from their co-financing resources.		

A.21. Executive summary (max. 750 words, approximately 1.5 pages)

1. The project "Upscaling Ecosystem Based Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia" (RECEM-Valles) is a climate adaptation investment aiming to enhance the resilience of livelihoods, ecosystems, irrigation infrastructure, and food security in the Valles Macro-region of Bolivia, to face the increasing hazards of climate change. The project structure and proposed activities are built on the close relationship between ecosystem functions and services (primarily hydrological regulation) on the one hand, and climate and social-ecological resilience on the other. The project aims to tackle climate change from an integral and systemic perspective.
2. The proposed project has been developed with the aim of changing the current paradigm of climate change vulnerability and conventional agricultural practices that degrade ecosystems, to a paradigm based on transformative production systems that are well adapted to climate change and enable restoration of ecosystems, to further enhance social-ecological resilience expressed in biodiverse climate-resilient agriculture and climate-proofed irrigation. This transition will involve the adoption and mainstreaming of innovative financial mechanisms - which have previously been piloted in other contexts in Bolivia – for use by financial intermediaries and to enable increased financial support to smallholders in the Valles Macroregion.
3. The project will use GCF funding to address identified risks and raise the adaptive capacity of rural communities, rendering them less vulnerable to CC induced food and water insecurity. The project delivers paradigm-shifting pathways by promoting

[2] The RECEM Valles lifespan was defined based on socio-technical aspects of general project implementation and projects with a strong emphasis on agroecology. First, projects implemented by state and non-state institutions show that the first five years are relevant for an adequate technical and organizational project's establishment. However, in the following five years, the sustainability is fine-tuned with the increasing involvement of the project management by the local actors, a phase that requires institutional follow-up. Second, depending on the level of biological diversification, agroecological management usually starts rebuilding ecosystem functions within the production plot after two to three years; yet, more resilient ecosystem functions at community (either territorial or landscape) scales and in temperate, semi-arid and drought-affected regions require longer periods. For these two reasons, a ten-year project provides an adequate timeframe for establishing the initiative's long-term viability.

resilient agroecology and reconfiguring food systems. The paradigm shift comes, in part, through the permanent transition from traditional agricultural practices characterized by high climate vulnerability and increasing loss and damage, to a system in which farmers are equipped to employ more resilient food production practices, have improved access to the credit and insurance products that make long-term investments financially viable, and are able to diversify their incomes and access markets for their crops. By permanently overcoming the technical, institutional, capacity and financing barriers to climate resilience, the project will create a virtuous circle of climate resilient production for vulnerable farmers.

4. The project's objectives will be achieved by implementing an integral and participatory micro-watershed management approach that includes: (i) improving the capacity of small-scale farmers to manage their agroecosystems sustainably, (ii) on-farm, climate-proofed irrigation systems, (iii) participatory and integral watershed management to restore ecosystem functions, particularly water regulation and supply, reduction of erosion and disaster risk and (iv) strengthening the corresponding governance and institutional capacities at local level to support climate risk management by smallholder farmers and their communities. An integral and transformative aspect of the proposal is catalyzing finance for long-term resilience building through increasing the access of smallholder farmers to a combination of financing mechanisms, including risk-informed insurance. It is estimated that the project will directly benefit 81,551 head of households (0.7% of the total population of the country and 5.5% of the population in Valles macro-region) including 2,800 indigenous people. The expected indirect beneficiaries are 1,251,769 (10.7% of total national population and 53.7% of the total Macro region population[3]). The project places strong emphasis on engagement of women and youth participation. The gender diagnosis has identified inequality gaps that the Project will address through the Gender Action Plan with a responsive approach, that includes qualitative indicators related to aspirational expected outcomes of the Project. Improvements in food security owing to training and inputs received to promote resilient agriculture are reflected in the action plan.

5. The project consists of four interrelated Components that seek to build climate resilience in the agroecological systems via integrated ecosystem management and enhanced governance:

Component 1. Strengthened food and income security in changing climate through climate resilient agricultural systems

Component 2. Smallholder water resources secured to reduce the risks from droughts and low rainfall

Component 3. Restored and conserved micro-watersheds and ecosystem functions and services

Component 4. Enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms

6. Bolivia is already experiencing a range of climate change-related impacts, including an increase in the national average temperature by 0.10°C per decade from 1939 to 2009, and a rate of increase of between 0.32°C to 0.34°C in the last 25 years.[4] The country is also experiencing rainfall variability and has observed a decreasing trend in average annual rainfall.
7. It is expected that climate change will continue to degrade areas of Bolivia's territory and inhibit growth in key sectors of the economy, particularly agriculture.[11] The Valles Macro Region - consisting of 65 municipalities covering 8,338,000 ha - is one of the most vulnerable regions to hydrological drought in Bolivia. The combination of very high exposure and sensitivity with very low adaptive capacity translates into very high vulnerability.
8. This issue is particularly acute in the Valles Macro-region due to its semi-arid climate and limited availability of water resources during the dry season. This represents a deep socio-ecological risk considering that in 2019, agriculture consumed approximately 80% of all available fresh water supplies, employing more than 29 percent of the labor force, 15.3 percent of the national Gross Domestic Product, and producing more than 90 percent of the country's food supply.[5]
9. Climate change scenarios (RCP 4.5 and RCP 8.5) for the year 2050 in the Valles Macro-region project an increase in temperature from +2.7ºC to +3.4ºC. This change will drastically affect the availability of water in quantity and quality, due to greater moisture loss through evaporation from soils and transpiration of vegetation[6]. Climate change scenarios (RCP 8.5) for 2050 show precipitation decrease of approximately 29% in the northeast and eastern parts of the Valles Macro-region, while in the southwest, precipitation will increase up to 15%. Such changes are expected to result in increased risk of slope erosion and the formation of landslides.
10. Women are particularly vulnerable to the effects of climate change.[7] Women manage at least 48% of agricultural production systems in Bolivia. Their main activities are crop production, bee keeping, forestry, animal husbandry, and selling agricultural

[3] Based on the REF, the total population of the microregion is 2.328.741 inhabitants.

[4] Government of Bolivia, 2020. Third National Climate Change Communication to United Nations Framework Convention on Climate Change (UNFCCC). https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf

[5] Instituto Nacional de Estatistica (2020). Boletín sectorial agropecuario 2020.

[6] Fundación Amigos de la Naturaleza (FAN) (2018). Estudio de la Línea Base Ambiental de la Macro-región Valles. Santa Cruz: FAN.

[7] L. Aguilar Revelo, "La igualdad de género ante el cambio climático: ¿qué pueden hacer los mecanismos para el adelanto de las mujeres de América Latina y el Caribe?", serie Asuntos de Género, N° 159 (LC/TS.2021/79), Santiago, Comisión Económica para América Latina y el Caribe (CEPAL), 2021.

surplus in the local markets.[8] This figure tends to increase due to the seasonal migration of men from rural to urban areas in search of better labor opportunities. Female-headed farms have limited access to credit and technical assistance, (among other services) as well as to key infrastructure for water collection and efficient irrigation. These services and infrastructure remain far more accessible to men.

11. The projected water balance for 2050 is expected to result in one of the greatest water shortages in Bolivia's history. Sustained supply of water will be limited to the areas with the highest vegetation cover in the Northwest and Southern regions of the Valles Macro-region. Changes to temperature and precipitation will include lags or delays in the onset of dry and wet seasons, which will modify the agricultural calendar in the Valles Macro-region.[9]
12. Moreover, in line with Law 300, The Mother Earth Law and Integral Development to Live Well, the processes for Development of Sustainable Production Systems within Territorial Management should increase the resilience in the face of climate change, fostering the implementation of the Joint Mechanism for Adaptation and Mitigation (JMAM). The same goal includes the implementation of integral and sustainable forest management and the management of other components of Mother Earth, to contribute to the JMAM. The JMAM is Bolivia's proposal for a strategic international agency (under the UNFCCC) and an approach (at the national level) for implementing non-market schemes for reducing deforestation and forest degradation, halting land deterioration, enhancing ecosystem functions, and promoting sustainable production systems, whilst taking indigenous peoples' knowledge into account, in order to contribute to climate change mitigation and adaptation of ecosystems and people.[10]
13. The total project cost is USD 63.3 million, which is comprised of USD 33.3 million of GCF funding, in the form of grants, and USD 30 million of co-financing from the Government of Bolivia, acting through the Ministry of Environment and Water (MMAyA), as well as from the Federation of Municipalities (FAM) in the form of in-kind contribution. The GCF Proceeds will be will be administered by FAO as Accredited Entity responsible for the overall quality assurance and oversight of the project. FAO is the sole Executing Entity for all GCF-funded project activities. The Government of Bolivia, acting through MMAyA, and the FAM will be Executing Entities, exclusively responsible for the implementation of activities funded from their co-financing resources.

[8] CFS (2019). Producto 2. Plan de Gestión Ambiental y Social. Proyecto: "Preservación y restauración de las funciones ambientales con énfasis en la seguridad hídrica para la adaptación al cambio climático y una mayor resiliencia de los agricultores familiares vulnerables de la Macro-región Valles de Bolivia". La Paz: CFS.

[9] Villazón & Nuñez, 2021

[10] Plurinational State of Bolivia (2012). Proposal for the development of the Joint Mitigation and Adaptation Mechanism for the integral and sustainable management of forests. Available at: https://unfccc.int/files/bodies/awg-lca/application/pdf/3_background_information_mecanismo-medium_(1)_bolivia.pdf

B. PROJECT/PROGRAMME INFORMATION

B.1. Climate context (max. 1000 words, approximately 2 pages)

a. Socio-economic context

14. Bolivia is highly vulnerable to the effects of climate change, such as the increase in extreme events, which are affecting watersheds (droughts, frosts, hails), and the negative ecological, economic, and social impacts are expected to be exacerbated. Poverty persists at 55% and is much higher in rural areas than in urban areas at 31%[11] concentrated in the Altiplano and Valles. Poverty can be attributed to poor access to land and services, both social and productive, and to the marginalization of women in organizations and restrictions on women's activities outside the home. Women continue to have less access to decision-making, training and other services, despite their growing role in production.[12] Women manage at least 48% of agricultural production systems in Bolivia and women represent approximately 42% of the economically active population in agriculture nationally. Women's main activities are crop production, bee keeping, forestry, animal husbandry, and commercial activities.[13] This number will increase over time due to the seasonal migration of men in search of better labour opportunities. Female-headed farms have limited access to credit and technical assistance, among other services and infrastructure, given that such credits and assistance are mainly aimed at men. While extreme poverty more than halved between 2005 and 2015, falling from 38 to 17 percent, almost one third of Bolivians living in rural areas cannot afford the cost of a basic food basket.[14] In this context, climate change exacerbates the already existing production challenges and livelihoods of rural women.[15] While food security has generally been increasing in recent years, it is still below the world average in a number of indicators. The prevalence of undernourishment is at 15.5%[16]. Approximately 27% of children under the age of five are stunted due to chronic malnutrition, which is the second-highest rate in Latin America and the Caribbean[17]. At the same time, much of the diet of the Bolivian population is based around starchy and fat foods, so obesity is also a problem in the country. Compared to the other 112 countries of the Global Food Security Index, Bolivia is lagging behind in other indicators of food availability and quality as well. The diversification of agricultural production, the increase of productivity and the increased access to markets for the farmers produce will increase the food security not only for the Valles Macro region but also for those areas receiving agricultural produce from this region.

15. **The slash-and-burn technique used in the forest region has led to the deforestation of 48,000 hectares from 2000 to 2015.** Agricultural systems are dependent on ecosystem services such as nutrient cycling, pollination, soil fertility, hydrological balances, and biological pest control, which ensure a balance in the ecosystem[18]. However, agricultural intensification and unsustainable land use has distorted the ecosystem equilibrium led to loss of ecological integrity, land degradation, and loss of environmental services provided by the ecosystems. These conditions are further worsened due to increasing effects of climate variability. More recently, extreme droughts have also affected forest ecosystems, causing forest fires and loss of vegetative cover. This has had direct impact on the ability to maintain water capacity and has caused the loss of soil organic matter and of biological diversity that is in many cases endemic to these areas.

16. **The Valles macro-region was prioritized using a multi-criteria analysis that is further described in paragraph 52. It i**s one of the most vulnerable areas in the country due to its semi-arid climate and limited availability of water resources during the dry season. It is estimated that in 2019, agriculture nationally employed more than 29% of the labor force and contributed 15.3% to the national GDP.[19] **About 11% of the surface area in Bolivia is dedicated to agriculture, specifically irrigated agriculture, and about 60% of the country's agriculture in terms of land area is located in the Valles Macro region**. The Valleys Macro region is characterized by subsistence family farming with farm plots of less than 2 ha each. These farms are often characterized as low-productivity agricultural systems.[20] Important crops are potatoes, maize, and vegetables, and other complementary crops depending on the altitude, such as beans, chili peppers, peanuts, and fruit trees, especially stone fruits. Irrigated plots are even smaller, ranging from 0.4 ha to 1.5 ha per family. These irrigated farms are responsible for 60% of food production in Bolivia.[21] Agriculture in the Valles Macro region is characterized by a complex set of interactions involving the timing and volume of water, patterns and location of precipitation, and agricultural seasonality. There are currently 161,982

[11] INE, 2015.
[12] PSARDI, 2016
[13] CFS (2019). Producto 2. Plan de Gestión Ambiental y Social. Proyecto: "Preservación y restauración de las funciones ambientales con énfasis en la seguridad hídrica para la adaptación al cambio climático y una mayor resiliencia de los agricultores familiares vulnerables de la Macro-región Valles de Bolivia". La Paz: CFS.
[14] WFP, 2020. integrated Context Analysis of Food Security in Bolivia "ICA - Bolivia"
[15] Ulloa, A.; Escobar, E.M.; Donato, L.M.; Escobar, P. (2008). Mujeres indígenas y cambio climático. Perspectivas latinoamericanas. Bogotá: UNAL-Fundación Natura de Colombia-UNODC.
[16] https://foodsecurityindex.eiu.com/Country/Details#Bolivia
[17] https://www.iadb.org/en/news/webstories/2013-03-04/bolivia-fights-malnutrition,10320.html
[18] Power AG (2010) Ecosystem services and agriculture: trade-offs and synergies.
[19] Insituto Nacional de Estatistica (2020). Boletin sectorial agropecuario 2020
[20] Agua Sustentable (2018). Análisis Socioeconómico de la Macro-región Valles. *Ibid*, footnote 7.
[21] MMAyA (2017). Programación Plurianual y Marco de Evaluación de Desempeño del Subsector de Riego 2017-2020.

hectares in the Valles Macro region served by irrigation systems and 86,740 hectares without. However, 40% of existing systems depend on intermittent water sources available only during the rainy season (the dry season extends for up to eight months), increasing the vulnerability of agriculture and the livelihoods that depend on it.

17. Smallholder farmers tend to have little or no access to formal credit, which limits their capacity to invest in the technologies and inputs they need to plan for anticipatory action to increase their resilience to climate change and reduce food insecurity and poverty.
18. The agricultural produce of smallholders in the project municipalities is mostly sold in local markets. Farmers make direct sales, such as at community fairs, municipal markets, and street selling. Indirect selling refers to sales to intermediaries for final retail in various long-distance outlets that smallholders cannot reach due to low production volumes, a lack of transportation facilities, long distances combined with inadequate roads, and high transportation costs because of all of these conditions. Farmers, if organized, make also indirect sales, such as through peasant or community economic enterprises, also includes institutional customers, primarily through national or sub-national public procurement. Long-distance outlets include, among others, major popular markets in primary and secondary cities, supermarkets, urban and peri-urban weekly fairs, and urban mobile vegetable and fruit vehicles (which have become more popular since the COVID-19 pandemic). The central government has approved four programs to support agricultural and livestock production under the framework of productive reactivation and food sovereignty.[22] One of these is the "National Program to Support Vegetable Production and Marketing" (that focuses on the following basic crops: onions, tomatoes, carrots, beans, and peas). The majority of the government budget allocated to these programs is devoted to production activities, with the remainder (10%) devoted to marketing assistance.[23]

b. Ecosystems and ecosystem services

19. **Agricultural systems rely mostly on ecosystem functions and services, in particular hydrological services for the irrigation of their farms.** Ecosystems such as wetlands, puna grassland and forests existent in Valles Macro-region supply water not only to local communities but also to dry regions.[24] Forest natural ecosystems also play an important role in controlling water erosion and floods and in stabilizing soils against landslides in steep terrain.[25&26] Nevertheless, the rapid and important forest cover changes during the last few decades have deeply modified the provision of hydrological services.[27]
20. A large portion of the ecosystem functions in the Valleys Macro region is related to forests. Forests cover 38% of the project area and are critical to hydrological regulation and provisioning, water infiltration, climate regulation, and prevention of soil erosion, flooding and drought. The Amazonian, Yungas, and Tucumano-Boliviano forests, located at the northeast and east of the Valleys Macro region, have the largest forestry potential and are thus priority areas for conservation to ensure the continued supply of ecosystem services important for the hydrological resources. Roughly half of Bolivia is covered by forests, and about half of the remaining forests are primary forests. There are significant pressures on these forests, which are increasing with time. In the late 1980s, the country had a low deforestation rate—about 0.2 percent annually—due to several factors including the poverty and weak export market of the country. However, during the 1990s, Bolivia's deforestation rate more than doubled to over 270,000 hectares per year primarily due to land use need for agricultural land. Land degradation is however an important challenge in Bolivia. Bolivian soils, both in the highlands and the lowlands, have little depth and are fragile and easily eroded, so a lot of the land is susceptible to degradation[28]. According to the FAO, between 1954 and 1996, the area of eroded soils increased by 86%, from about 24 to 43 million hectares[29]. While the rate of soil erosion has slowed since then, soil erosion rates from 2001 to 2012 were still among the highest in the world, at 37.8%[30]. This widespread erosion affects 45% of the country and up to 70-90% of the land in the valleys of the country[31]
21. During funding proposal preparation, a detailed socio-ecological baseline analysis was undertaken for the farming communities across the Valley Macroregion. Each community differs slightly in the challenges faced regarding management of water and land resources, and the alternative solutions that can help overcome these challenges. The main challenges faced by the communities in the proposed intervention area include water scarcity and management, desertification and soil

[22] Supreme Decree No. 4560 (August 02, 2021). Available at: https://siip.produccion.gob.bo/repSIIP2/files/normativa_12345_04082021329a.pdf
[23] MDRyT (Ministry of Rural Development and Lands) (2021). Programas de Apoyo al Sector Agropecuario Aprobados Mediante Decreto Supremo No. 4560 de 2 de agosto de 2021 (*Power Point* presentation).
[24] Célleri, R., Feyen, J., 2009. The hydrology of tropical andean ecosystems: importance, knowledge status, and perspectives. Mt. Res. Dev. 29, 350–355.
[25] Bathurst, J.C., Amezaga, J., Cisneros, F., Novillo, M.G., Iroumé, A., Lenzi, M.A., Aguirre, J.M., Miranda, M., Urciuolo, A., 2010a. Forests and floods in Latin America: science, management, policy and the EPIC FORCE project. Water Int. 35, 114–131.
[26] Guns, M., Vanacker, V., 2013. Forest cover change trajectories and their impact on landslide occurrence in the tropical Andes. Environ. Earth Sci. 70, 2941–2952.
[27] Jones, J., Almeida, A., Cisneros, F., Iroumé, A., Jobbágy, E., Lara, A., Lima, W.deP., Little, C., Llerena, C., Silveira, L., Villegas, J.C., 2017. Forests and water in South America. Hydrol. Process. 31, 972–980.
[28]https://www.researchgate.net/publication/277198222_Environment_and_Climate_Change_in_Bolivia_-_Challenges_and_Opportunities_for_Development
[29] https://europa.eu/capacity4dev/file/51852/download?token=_X3syhxZ
[30] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5722879/
[31] http://www.fao.org/3/I9016ES/i9016es.pdf

degradation, vegetation and forest conservation, water and soil pollution from other human activities, climate variability and extreme events, lack or basic technical knowledge on good practices, and increasing stress in agriculture production. For further details, please refer to the technical report included as appendix 5 to the Feasibility Study.

c. Climate context (historic and projected climate change)

22. The latest IPCC report (2021)[32] highlights the increased likelihood of more frequent concurrent heatwaves and droughts on the global scale and increases in agricultural and ecological droughts (in South America). It is virtually certain that the land surface will continue to warm more than the ocean surface (likely 1.4 to 1.7 times more). The South American Monsoon region is projected to see the highest increase in the temperature of the hottest days, at about 1.5 to 2 times the rate of global warming (high confidence). Along the same line, there are projections of increased agricultural and ecological drought for the mid-21st century, for 2°C of global warming level and above (high confidence). Increases in one or more aspects of drought, aridity, and fire weather (high confidence) will affect a wide range of sectors, including agriculture, forestry, health, and ecosystems. At the same time, the intensity and frequency of extreme precipitation and pluvial floods is projected to increase (medium confidence) for a 2°C of global warming level and above. The project acknowledges the recent IPCC AR6 report and the fact that a set of new generation model ensemble is available (CMIP6) based on the new Shared Socio-economic pathways (SSPs); but at the time of the technical work for this project, as described in annex 2, these models were not available.
23. **The vulnerability of the water provision and the agricultural (crops and livestock) sectors to climate change impacts is high,[33] since hydrological cycles are highly impacted by rainfall and temperature variability.**[34] Studies predict that the crop and livestock sectors will be among the most affected, facing losses of 6-14% of sectoral GDP.[35] This is anticipated primarily due to the predicted declines in productivity, which for a number of key staple crops could reach 17%.[36] Smallholder farmers are particularly vulnerable, as their current crop yields are very low – the average potato yield is 5.7 t/ha, the lowest in the Andean region, and the average maize yield is only 2.2 t/ha.[37] Unsustainable land use change (particularly deforestation) and management (e.g. intense mono cropping) because of the deterioration of ecosystem functions that they foster, decreasing climate resilience, particularly concerning water and nutrient cycling exacerbate these impacts. Hydrological analysis shows an increase in the crop water demand due to increased temperature and evapotranspiration. For detailed description of the results from the hydrological modelling for water balance, see Section 7 of Annex 2 - Feasibility.
24. **Climate change presents a significant risk to crop yields and the broader economic performance of the agricultural sector, given its effects on temperature, precipitation, intensity and frequency of extreme events, and glacier retreat among others.[38]** The semi-arid nature of the region (400-600 mm average precipitation per year) and the intermittent sources of water define both the Valles Macro region's exposure and sensitivity to climate change.

Past and current climate trends

25. The territory of Bolivia consists of 1014 meteorological stations, of which only 349 stations have complete data for the period of 15 years and 241 have data from 20 years. Figure 1 shows a map of the meteorological stations in Bolivia[39] and neighboring countries, which have been considered in the water balance hydrological modelling for the Valles Macro-region presented below. Table 1 shows the state of the meteorological stations in the country. For more information on the meteorological stations in Bolivia, see Section 7 of Annex 2-Feasibility study.

[32] IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.
[33] Government of Bolivia, 2020. Third National Communication on Climate Change to UNFCCC. Available online: https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf
[34] Government of Bolivia, 2020. Ibid.
[35] CEPAL (2014). La economía del cambio climático en Bolivia: Impactos en el sector agropecuario. Available online: https://repositorio.cepal.org/bitstream/handle/11362/39834/1/2014-291_CCBol_agropecuario.pdf
[36] Rambal et al. (2015). Garantía de Acceso al Agua como un Derecho Fundamental. Madrid: Rambal.
[37] Ministerio de Medio Ambiente y Agua (2017). Plan Plurianual de Riego 2017-2020.
[38] Prager SD; Rios AR; Schiek B; Almeida JS; González CE; 2020. Climate change vulnerability and economic impacts in the agricultural sector in Latin America and the Caribbean. IDB Technical Note IDB-TN-01915. Inter-American Development Bank (IDB); International Center for Tropical Agriculture (CIAT). Cali, Colombia. Available online: https://publications.iadb.org/publications/english/document/Vulnerability-to-Climate-Change-and-Economic-Impacts-in-the-Agriculture-Sector-in-Latin-America-and-the-Caribbean.pdf
[39] Ministry of Environment and Water, 2017. Balance Hídrico Superficial de Bolivia.

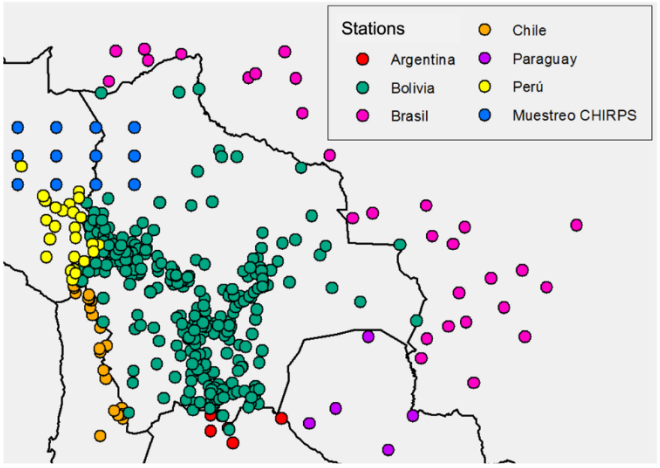


Figure 1. Map of the meteorological stations in Bolivia and neighboring countries (green dots are stations in Bolivia)

Table 1. Description of the state of meteorological stations in Bolivia.[40]

	Meteorological stations (#)	Stations with minimum data in 1980-2016	Stations with quality data	Stations used for the hydrological modelling
Min. T	443	155	85	117
Max. T	444	153	70	123
Precipitation	1136	322	272	300
Sun Hours	111	25	3	36
Evaporation	187	41	6	
Wind	320	153	71	134

26. The climate of Bolivia depends fundamentally on the South American monsoon, the (mountainous) relief and the presence of the Amazon.[41] There are two main seasons: a wet or rainy season from November to March, and a dry season from May to October. Bolivia is already experiencing climate change impacts,[42] including a national average increase in temperature of 0.10°C per decade from 1939 to 2009, with an increase of 0.32°C in the last 25 years.[43] In comparison to local changes, trends in temperature at the national level[44] are less marked but nonetheless show an increase in standardized temperature anomalies, with most stations having detected a temperature increase of 0.1°C per decade during the period 1965 to 2004, corresponding to an overall increase of 0.4°C over the last 40 years.
27. The country is also experiencing rainfall variability. In the baseline period 1961-1990, there was an upward precipitation gradient from the southwest (highlands) to the northeast (eastern plains). For the 1971-2000 period, precipitation decreased in the altiplano region in the southeast of the country (Potosí), in the northeast of the department of Oruro, in the southeast of the department of La Paz and in the southeast of Chuquisaca (southern valley). Precipitation increased in the eastern plains (Chapare, Cochabamba) and in the Amazon (Pando). For the period 1981-2010, a decrease in precipitation was observed in the southwest (altiplano), the northeast of the department of Tarija and the southwest of the department of Cochabamba (northern valleys), but there was an increase in precipitation in the eastern plains (Chapare, Cochabamba).[45] Existing assessments lack precise quantitative information on the historical trends for rainfall variability.
28. In the Valles Macro region, production systems vary according to altitude, which ranges from 1,400 to 3,800 msl, with average annual precipitation ranging from 300 to 1,200 mm/year and average temperatures from 8° to 20°C. Most of the precipitation occurs in the wet season, between 60% and 80%, while the dry season gets between 0 and 20% of the annual precipitation.

[40] Friends of the Nature (FAN), 2021. Baseline Hydrological Balance for the Valles Macro-regions. Analysis for the feasibility study for the GCF project proposal "RECEM Valles"

[41] Montes de Oca 1995; Marengo et al., 2004, Zhou & Lau 1998, Xue et al., 2006, Chou & Neelin, 2001

[42] Vuille, M., Bradley, R. S. (2000). Mean annual temperature trends and their vertical structure in the tropical Andes. *Geophysical Research Letters*, *27*(23): 3885-3888.

[43] Government of Bolivia, 2020. Third National Climate Change Communication to UNFCCC. https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf

[44] Seiler, C., Hutjes, R. W., Kabat, P. (2013). Climate variability and trends in Bolivia. *Journal of Applied Meteorology and Climatology*, *52*(1): 130-146.

[45] *Ibid.* Footnote 23

29. According to the perception of rural producers, hailstorms have become frequent in the last ten years in the puna area. They are unpredictable, more frequent, last longer, and are more intensive.[46] These perceptions are aligned with the records of the Recovery and Emergency Plan of the Agricultural sector 2021 - 2022 of the Ministry of Rural Development and Lands (MDRyT). The records shows that 2,012 events in the period between 2010 - 2021, of this total, 89%, represent four types of extreme events: floods (34%), hailstorms (25%), frosts (15%) and droughts (14 %). The summer agriculture season (October 2020 to April 2021) and winter (May to September 2021) extreme events have affected a total of 122.939 families, 240.07 hectares, 274.022 livestock, and 14.462 livestock death. In the 2020-2021 agriculture season, frosts occurred with the highest incidence, followed by floods, hailstorms, and droughts. Figure 2 shows the frequency of frost in two areas in Bolivia (within the Cochabamba district). To back up these perceptions, information found on the study The Effects of Climate Change on hailstorm[47] state that as a result of anthropogenic warming, it is generally anticipated that low-level moisture and convective instability will increase, raising hailstorm likelihood and enabling the formation of larger hailstones.
30. On the other hand, in the socioeconomic study (Sustainable Water 2018), spring frosts, hail, wind, and sun damage are the most harmful climatic adversities to fruit production. The only effective protection method against this climatic adversity is the anti-hail nets. They are being used in different producing areas to protect against damages from hail and sun. The mesh prevents damage to production and the fruit trees from the storm time. The main limitation of this technology is the high investment required from the farmers, so it is recommended to install it in places where the risks of falling hail are very high.

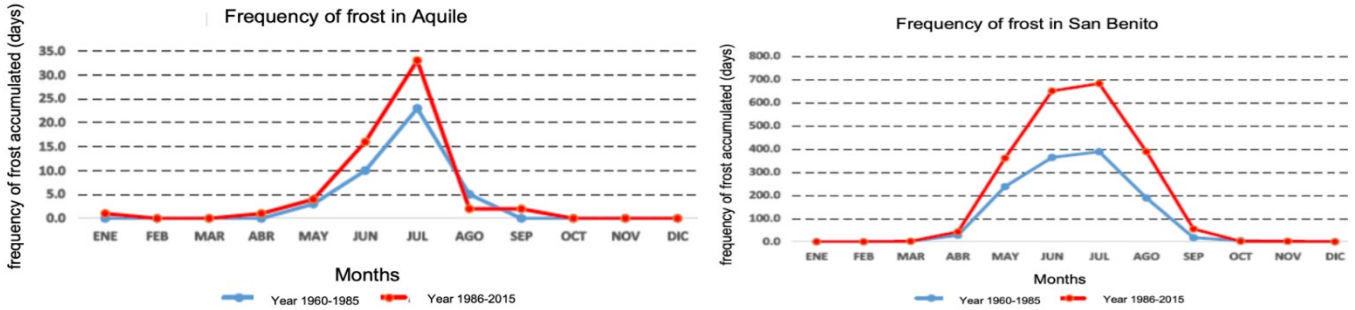


Figure 2. Frequency of frost in two areas in Bolivia (within the Cochabamba district).

31. Events such as El Niño and La Niña drastically modify climatic behaviour in many regions of the Bolivian territory. During El Niño, the Altiplano generally suffers a decrease in rainfall, while the lowland regions experience a relative increase in precipitation (which is already high).The most recent findings from the IPCC are more conclusive than previously regarding the effect of climate change on El Nino. The most recent findings from the IPCC are more conclusive than previously regarding the effect of climate change on El Nino. El Niño–Southern Oscillation is projected to be amplified by the second half of the 21st century in the SSP2-4.5, SSP3-7.0 and SSP5-8.5 scenarios. The paper ''Increasing ENSO–rainfall variability due to changes in future tropical temperature–rainfall relationship[48]'' shows that intensification of ENSO rainfall variability occurs in response to global warming, whether or not there is any project changes is the SST anomaly. ENSO rainfall changes are likely to amplify in a warming world[49].

Extreme events

32. Bolivia has historically been exposed to floods and droughts. Approximately four out of 10 people live in flood-prone plots, and more than 16% of the population live in areas at risk of drought.50 During the last decade, Bolivia's weather patterns have undergone significant changes: extreme rainfall, floods, landslides, and droughts have pushed the poorest and most marginalized communities beyond their ability to respond. Bolivia's worst drought in 25 years took place between November 2016 and February 2017. A state of emergency was declared after over half of Bolivia's territory was affected. About 339 municipalities declared their own emergencies related to the drought. Official estimates suggested that the drought affected 125,000 families, 290,000 hectares of agricultural land and 360,000 heads of cattle.[51]

Climate change scenarios

[46] Government of Bolivia, 2020. Third National Communication on Climate Change to UNFCCC. Available online: https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf

[47] https://www.nature.com/articles/s43017-020-00133-9

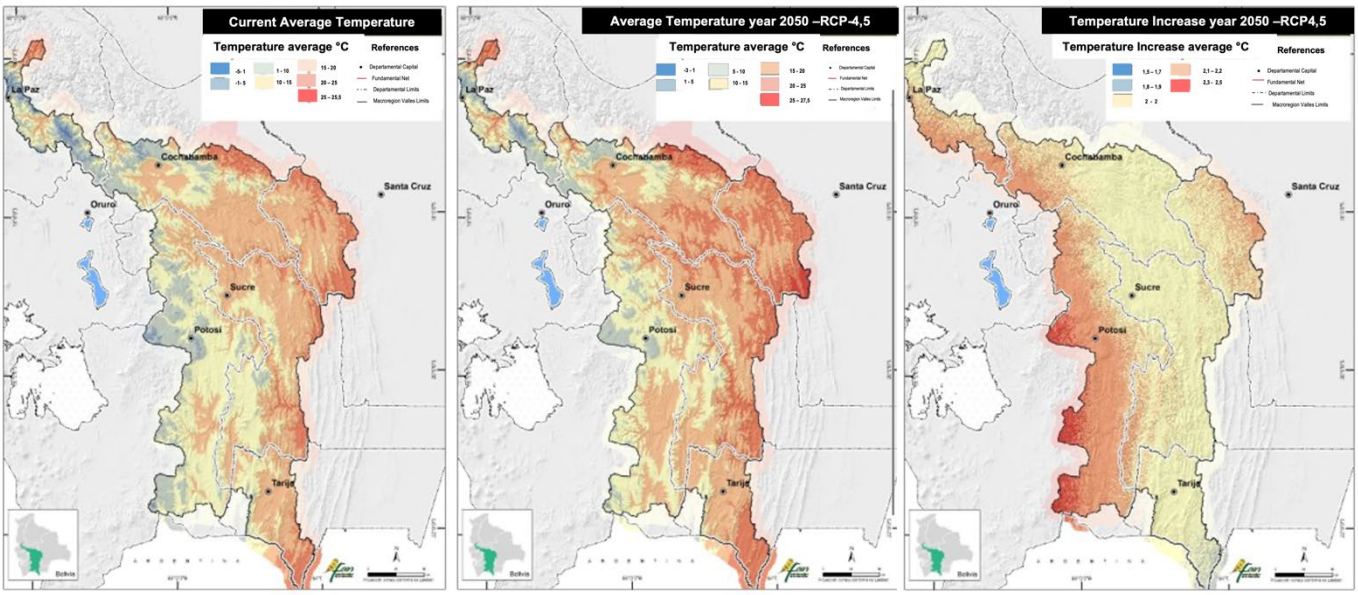
[48] https://www.nature.com/articles/s43247-021-00108-8

[49] https://www.nature.com/articles/s41586-018-0776-9

[50] Estimates based on the Municipal Risk Index (MRI) developed by the Ministry of Development Planning (MPD) of Bolivia and the World Bank in 2012 (World Bank, 2014).

[51] The Guardian, 2016. Available online: https://www.theguardian.com/world/2016/nov/21/bolivia-drought-state-of-emergency-water-shortages

33. For the purposes of this Feasibility Study, Fundación Amigos de la Naturaleza (FAN) prepared a climate analysis in 2017 and updated it in 2021 for the Valles Macro region. For the climate change scenario modelling, a spatial analysis of climate patterns was carried out according to geospatial distribution and seasonal and temporal behavior of temperatures and precipitation, defining the degree of correlation with current climate trends using the SENAMHI weather station database (1971-2015). The geospatial dimension of temperature climate patterns was analyzed with data available from WorldClim. To better characterize and represent the spatial distribution of precipitation, the climate data measured by stations were adjusted with the NASA (National Aeronautics and Space Administration) Tropical Rain Measurement Mission (TRMM) mapping database. This adjustment was made on a regional scale to calibrate the data with stations close to the Valles Macro region because of the limited number of operational weather stations in the area.
34. The methodology used for the climate projections is based on five models, selected due to their high correspondence with the current climate; 1) CSIRO-Mk3.6.0 (Collier MA et al. 2011), 2) HadGEM2-ES (Collins WJ et al. 2011), 3) IPSL-CM5A-MR (Dufresne JL et al. 2013), MIROC5 (Watanabe M et al. 2010), MRI-CGCM3 (Yukimoto S. 2012). This information base was integrated by determining for each pixel (1km2) the average of the five global atmospheric circulation models (GCM) of the CMIP5 experiment (Coupled Model Intercomparison Project), determining the monthly temperature (maximum, minimum, and mean) and monthly precipitation for the year 2050 (scenarios RCP4.5 and RCP8.5). The average of the five selected models was taken to moderate extreme trends. This enables the better assessment of possible future impacts while maintaining the consistency of current trends in terms of rainfall and temperature distribution patterns, which are highly variable due to the topography (from 600 to 6,300 m above sea level) and steep slopes (above 30 degrees of inclination). Extant climate knowledge in the region was incorporated to ensure the consistency of results according to climatic heterogeneity of ecological floors in the Valleys Macro region.[52]
35. The **baseline years for the climate change projections cover 1950 to 2000**. The projections are made for the **2050 and 2100, using RCP4.5 and RCP8.5**. For detailed information on the methodology and data used for the climate projections, as well as the results for RCP8.5, see Section 6 in Annex 2 - Feasibility study.
36. Climate change scenarios (RCP 4.5) for the year 2050 in the Valles Macro-region show significant increases in the annual average temperature, mainly in the valleys, where temperatures will reach annual averages of 25°C (RCP4.5) and 28°C (RCP8.5), meaning an approximate increase of up to 2.5°C (RCP4.5) and 3.4°C (RCP 8.5) by 2050 (*Figure 3*), with a greater increase at the end of the dry season. These trends will undoubtedly impact the biodiversity, in particular resulting in change in the distribution and abundance of flora between ecological floors, and the production systems of local populations.[53]
37. Climate change scenarios (RCP 4.5) for 2050 show that precipitation follows a pattern of higher rainfall in the northern part of the Valles Macro region. By 2050, rainfall is expected to decrease by up to 21% according to the RCP4.5 scenario and 29% according to the RCP8.5 scenario. This trend will make water supply critical (*Figure 4*).



[52] For reference: The areas with the highest rainfall are concentrated in the Carrasco protected area and in the southern region of the Chapare, where rainfall usually exceeds 2,500 mm per year. In the highlands, the preponderant rainfall is less than 600 mm per year. In the middle zone, it ranges from 600 to 900 mm per year, and in the lower part, in the valleys, rainfall is between 900 and 1,200 mm per year.

[53] Government of Bolivia, 2020. Third National Communication on Climate Change to UNFCCC. Available online: https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf

Figure 3. Baseline and climate scenarios for temperature according to RCP 4.5: (a) Mean temperature for baseline 1950 to 2000, (b) climate scenario for mean temperature for 2050 and (c) Change in temperature for 2050 in the Valles Macro region.

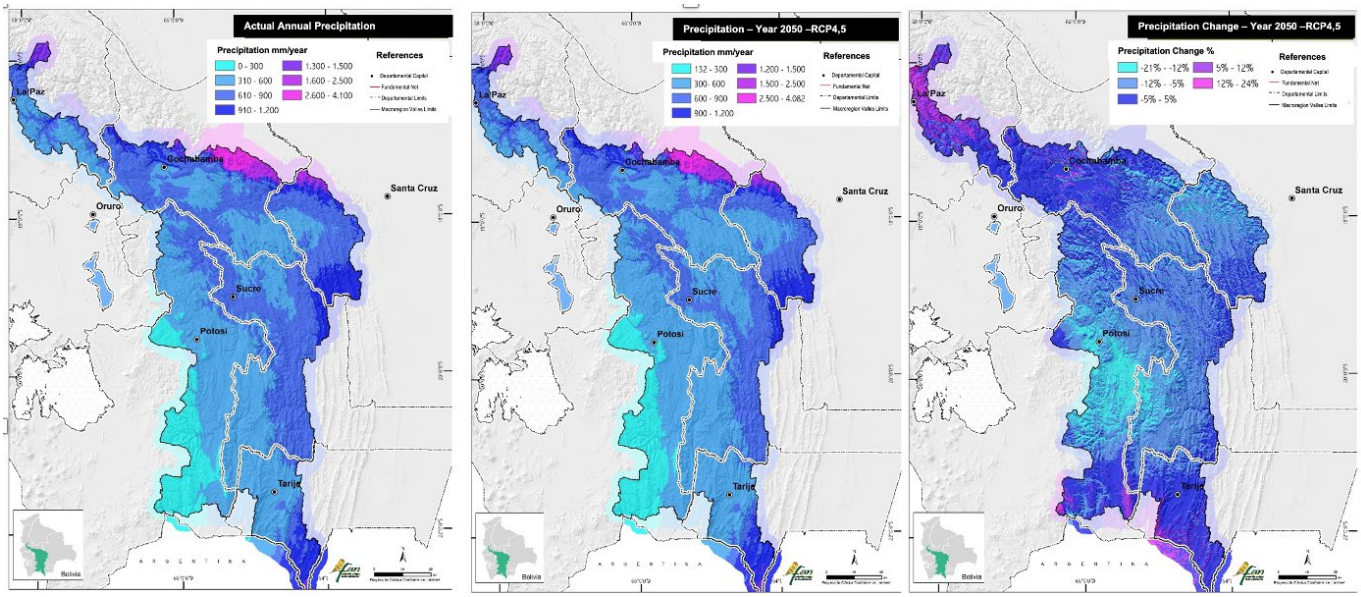


Figure 4. Baseline and climate scenarios for precipitation according to RCP 4.5: (a) Mean precipitation for baseline 1950 to 2000, (b) climate scenario for annual precipitation for 2050 in the Valles Macro region and (c) change in precipitation for 2050.

38. **Under the 2050 scenario (RCP 4.5), evapotranspiration is projected to undergo changes towards 40% increase under RCP4.5 and 50% increase under RCP8.5, meaning that ecosystems will release more moisture, causing imbalances in infiltration and runoff processes.** For agricultural production, water availability is fundamental, mainly for crops (including potatoes, maize, and vegetables and other crops depending on altitude, such as beans, chili peppers, peanuts, and fruit trees) that contribute to food security in the region. Therefore, the results reflected through the current water balance delimit areas of high importance according to surplus water levels (greater than 400 mm/year) located mostly in the northern and eastern region of the study area. The water balance highlights the water deficit in the Valleys Macro region, currently up to -1,000 mm/year. This will become more critical, reaching -1,240 mm/year in the RCP 4.5 scenario and -1,250 mm/year in the RCP8.5 scenario, mostly exacerbated in the highlands (*Figure 5*).

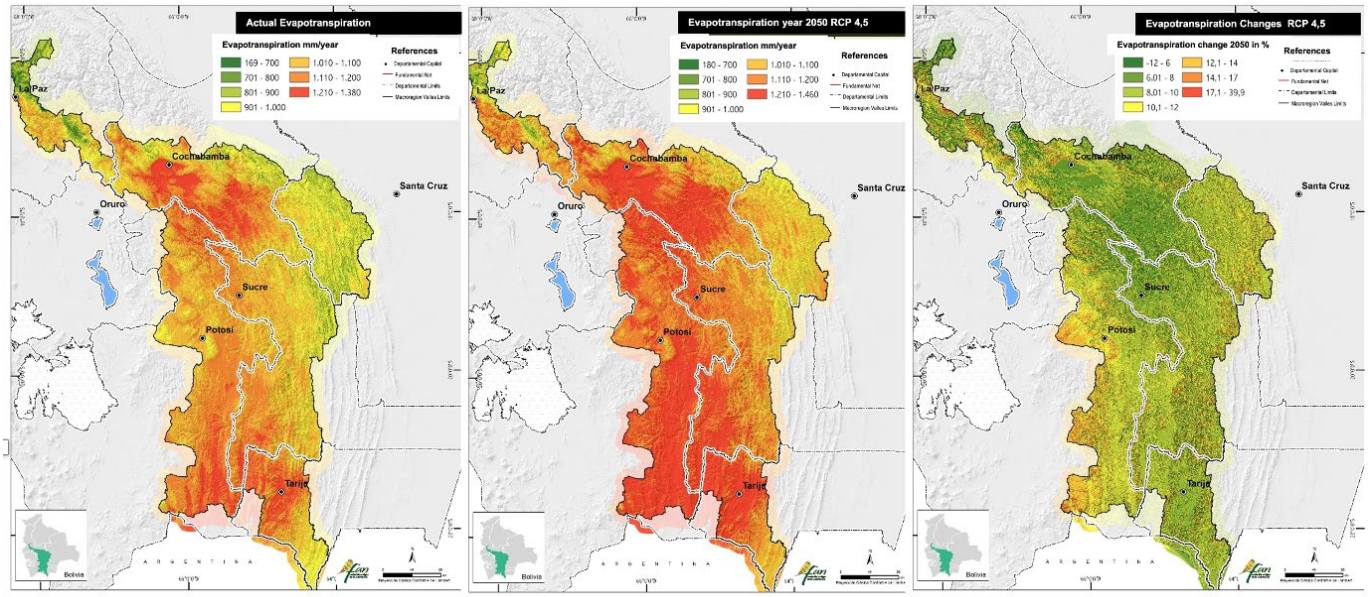


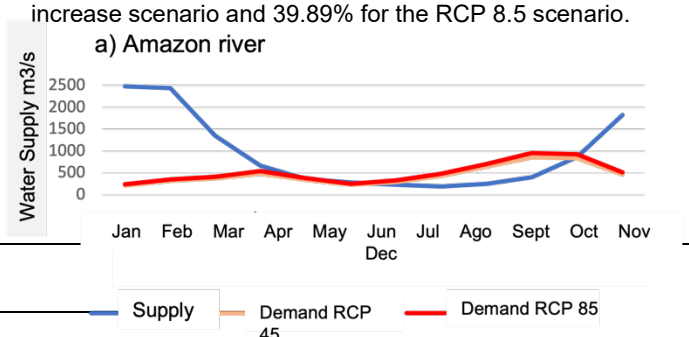
Figure 5. Baseline and climate scenarios for evapotranspiration according to RCP 4.5: (a) Mean evapotranspiration for baseline 1950 to 2000, (b) climate scenario for annual evapotranspiration for 2050 in the Valles Macro region and (c) change in the evapotranspiration for 2050.

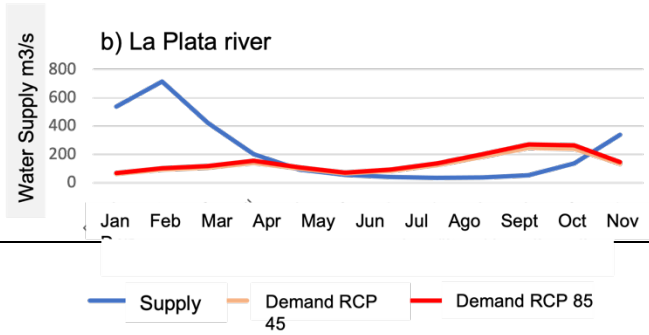
c. Water balance under climate change scenarios

39. **Results from the water balance modelling show that changes in precipitation lead to the reduction of water availability for rainfed crops, and alterations of discharge in river systems may lower reliability of irrigation water supply for irrigated crops and/or increase the demand for irrigation.** The climate change projections are based on

meteorological data from the National Water Balance (2018), which were used to calibrate two hydrological basins for the Valles Macro region in WEAP: one for the Amazon region and the other for the Plata region. In this way, basin delimitation[54] and data on precipitation and mean temperature at the basin level were obtained. In the WEAP model for hydrological modelling, the Amazon region and the Plata region have 23 and 38 hydrographic units, respectively.

40. **The projected water balance for 2050 is expected to result in a devastating water shortage in Bolivia**. Sustained supply of water will be restricted to the areas with the highest vegetation cover in the Northwest and Southern regions of the Valles Macro region. Changes to temperature and precipitation will include lags or delays in the onset of dry and wet seasons; this will modify the agricultural calendar in the region.[55] Figure 6 shows the current and projected water balance in the Valles Macro region. Results from the modelling show that close to 90% of the region is at high to very high risk of desertification.[56] The results from the water balance modelling will inform the choice of the climate-proofing irrigation technology and methods aligned with the O&M Plan (Annex 21) including (a) Decreasing the amount of water given per irrigation, (b)adoption of demand or rotational system for irrigation and (c) adopt water irrigation efficient technologies.
41. The hydrological modelling carried out by Mauricio Villazon (2021), using WEAP[57], compares the hydrological demand and supply for the Valles Macro region under climate scenarios for the period 2036 - 2065, with the following climate change scenarios: MIROC5 RCP_4.5 and MIROC5 RCP_8.5 in the Amazon region and CCCma-CanESM2 RCP_8.5 and ICHEC-EC-EARTH RCP_4.5 in the Plata region. For a detailed description of the methodology, data use and results, see Section 7 of Annex 2 Feasibility Study.
42. The average water supply in the Amazon region is equivalent to 1230.53 m^3/s, the irrigation demand has been estimated at 438.80 m3/s and the population demand at 1.50 m^3/s, giving a total demand of 440.30 m^3/s. Figure 6 shows the monthly distribution and it can be observed that between August and October, the demand exceeds the water supply, generating a deficit of 12.91%. The average water supply in the La Plata region is equivalent to 253.32 m^3/s, the irrigation demand was estimated at 124.49 m^3/s and the population demand at 0.57 m^3/s, giving a total demand of 125.06 m^3/s. The analysis shows that between June and November, the demand exceeds the water supply, generating a deficit of 35.71%.
43. In the Amazon region, the total demand for the current condition is 440.30 m^3/s (Figure 6a and Table 2a). For future conditions, a population demand of 2.26 m^3/s is estimated; the irrigation demand is 457.76 m^3/s according to the RCP 4.5 increase scenario and 508.31 m^3/s in the RCP 8.5 scenario, resulting in a total demand of 460.02 m^3/s and 510.57 m^3/s, respectively. The water supply according to the MIROC5 RCP_4.5 scenario is 947.23 m^3/s. Figure 6a shows the monthly distribution and shows that between July and November, the demand exceeds the water supply, generating a deficit of 21.12% for the RCP 4.5 increase scenario and 24.38 % for the RCP 8.5 scenario. The water supply according to the MIROC5 RCP_8.5 scenario is 928.65 m^3/s. The results show that between May and October, the demand exceeds the water supply, generating a deficit of 23.54% for the RCP 4.5 increase scenario and 25.85% for the RCP 8.5 scenario.
44. In the La Plata region, the total demand for the current condition is 125.06 m^3/s (Figure 6b and Table 2b). For future conditions, a population demand of 1.83 m^3/s is estimated, the irrigation demand according to the RCP 4.5 increase scenario is 129.87 m^3/s and for the RCP 8.5 scenario, it is 144.22 m^3/s, resulting in a total demand of 131.70 m^3/s and 146.04 m^3/s, respectively. The water supply according to the CCCma-CanESM2 RCP_ 8.5 scenario is 250.35 m3/s. Figure 6b shows the monthly distribution and it can be observed that between May and November, the demand exceeds the water supply, generating a deficit of 36.13% for the RCP 4.5 increase scenario and 39.08% for the RCP 8.5 scenario. The water supply according to the ICHEC-EC-EARTH RCP_4.5 scenario is 226.23 m3/s. The results show the monthly distribution and is shown that between May and November, the demand exceeds the water supply, generating a deficit of 37.02% for the RCP 4.5 increase scenario and 39.89% for the RCP 8.5 scenario.





[54] Villazón & Nuñez, 2021. Climate change analysis for the GCF Recem Valles Project.

[55] *Ibid*, footnote 7.

[56] Friends of Nature Foundation (FAN) (2018). Environmental Baseline Study of the Valles Macro-region. Santa Cruz: FAN.

[57] The WEAP (Water Evaluation and Planning) is a unique water resources planning software system that allows to account for a changing climate through an internal rainfall run-off module which simulates hydrologic patterns based on climatic input. This ability to include climate change in the development of future scenarios makes it a powerful tool for informing climate adaptation policy-making. As opposed to historic hydrologic inputs, WEAP uses inputs such as precipitation, temperature, humidity, and wind speed. These inputs are derived from downscaled climate change scenarios, and are used to calculate how much of the precipitation that falls in a particular area ends up as run-off into streams, recharge to groundwater, or evapotranspiration through vegetation.

Figure 6. Mass balance ICHEC-EC-EARTH RCP 4.5 climate scenario for horizon 2036 – 2065 (a) Amazon river and (b) Plata river.

Table 2. Mass balance ICHEC-EC-EARTH RCP 4.5 climate scenario for horizon 2036 – 2065:

(a) Amazon river

m³/s	JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Anual
Supply	2489.27	2441.03	1351.33	662.02	362.61	282.99	231.04	191.18	247.85	400.45	872.99	1834.03	947.23
Demand RCP4.5	216.84	322.80	374.27	488.07	346.78	228.45	297.71	435.73	641.83	861.12	840.16	466.47	460.02
Demand RCP4.5	240.54	358.20	415.35	541.71	384.82	253.43	330.34	483.60	712.46	955.96	932.69	517.73	510.57
Deficit RCP 4.5	0.00	0.00	0.00	0.00	0.00	0.00	66.68	244.55	393.98	460.67	0.00	0.00	97.16
Deficit RCP 8.5	0.00	0.00	0.00	0.00	22.21	0.00	99.30	292.42	464.61	555.51	59.70	0.00	124.48

(b) Plata river

m³/s	JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Anual
Supply	2489.27	2441.03	1351.33	662.02	362.61	282.99	231.04	191.18	247.85	400.45	872.99	1834.03	947.23
Demand RCP4.5	216.84	322.80	374.27	488.07	346.78	228.45	297.71	435.73	641.83	861.12	840.16	466.47	460.02
Demand RCP4.5	240.54	358.20	415.35	541.71	384.82	253.43	330.34	483.60	712.46	955.96	932.69	517.73	510.57
Deficit RCP 4.5	0.00	0.00	0.00	0.00	0.00	0.00	66.68	244.55	393.98	460.67	0.00	0.00	97.16
Deficit RCP 8.5	0.00	0.00	0.00	0.00	22.21	0.00	99.30	292.42	464.61	555.51	59.70	0.00	124.48

45. In conclusion, it is observed that the deficit increases under future conditions. In the Amazon region, a current deficit of 12.91% is estimated. For the RCP 4.5 increase scenario, it is estimated at between 21.12% and 23.45%, while for the RCP 8.5 increase scenario, it is estimated at between 24.38% and 25.85%. In the La Plata region, a current deficit of 35.71 % is estimated. For the RCP 4.5 increase scenario, it is estimated between 36.13% and 37.02%, while for the RCP 8.5 increase scenario, it is estimated between 39.08% and 39.89%.
46. In the winter season (June – July), frosts are common and frequent,[58] rainfall is less abundant than in spring-summer periods (river levels are low), and temperatures are low. These climatic factors reduce the possibility of doing agriculture in almost the entire project intervention area. Climate change not only threatens economies and, therefore, social stability, but will also modify the basis of the ecological processes that sustain life on the planet.[59] These effects are significant in the primary sector. In agriculture, yields are expected to decline across the board if temperatures continue to rise.[60] Additionally, there is the aggravating factor of the proliferation of pests and diseases, while productive variability will also affect prices and food security.[61]

d. Project target area: Valles Macro-region

47. **The project target area consists of 65 municipalities in Valles Macro-region and is one of the most climate vulnerable regions to hydrological drought in Bolivia.**[62] The region covers 8,338,000 ha and has a population of approximately 2,328,741 people, mostly (80%) dedicated to small-scale (partially subsistence) farming. Approximately 63% of the total population of the region are living in a poverty situation, out of which 47% correspond to the moderate poverty group and 16% to the extreme poverty group. The Valleys Macro-region is one of the most vulnerable areas of the country due to its semi-arid climate and limited availability of water resources during the dry season[63]. It is estimated that, in 2019, agriculture at the

[58] GoB, 2020. Third National Climate Change Communication to UNFCCC. https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf
[59] Bray, Barry, Madrid, Merino & Zúñiga, 2010 in CIPCA, 2015.
[60] Michel, 2011, CIPCA, 2015.
[61] Cepal, 2009 in CIPCA, 2015.
[62] GoB, 2020. Third National Climate Change Communication to UNFCCC. https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf
[63] Estudio de Escenarios de Cambio Climático en los Valles de Bolivia; Organización de las Naciones Unidas Para la Alimentación y la Agricultura, Año 2021

national level employed more than 29% of the labour force and contributed 15.3% to the national GDP.[64] Los Valles is characterized by subsistence family farming with cultivation plots of less than 2 ha each with low productivity. Irrigated plots are even smaller, ranging from 0.4 ha to 1.5 ha per family. It is worth mentioning that family farming provides 61% of the food for the family food basket, so the effects of climate change on food producers result in shortages of products in the basic family food basket, which generates vulnerability to food insecurity.

48. The most important crops in this area are beans, carrots, potato, broad beans, peas, tomato, cucumber, paprika, chard, celery, cabbage, broccoli, spinach. Fruit trees are also vital to this area: mainly bananas and citrus fruits. Table 3 shows the cultivated land for each of the crops in the Valles Macro-region and their water demand.

Table 3. Overview of key crops in Valles Macro-region, their water needs and crop area.

Crop	Crop water need (mm/total growing period)	Crop area (ha)
Barley/Oats/Wheat	450-650	125,164
Bean	300-500	3,193
Citrus	900-1200	4,546
Maize	500-800	46,487
Peanut	500-700	1,466
Pepper	600-900	770
Potato	500-700	59,127

49. Over 90% of Bolivia's water use is for the agricultural sector, however performance evaluation studies of the irrigation systems conducted in recent years confirm that irrigation efficiency in new and old systems is low (below 20%), infrastructure maintenance is problematic in some cases, and the transition to new irrigated cropping practices and innovation is slow. There are currently 161,982 hectares in the Macro-region served by irrigation systems and 86,740 hectares without. However, 40% of existing systems reported at national level are unable to access water consistently and efficiently, exacerbating smallholder vulnerability to rainfall variability[65]. Studies on previous irrigation projects have shown that successful technified irrigation projects are those with support managed by NGOs and/or foundations, which monitor the operation and maintenance in the medium term (5 years). Some factors with a high impact on the success rate of initiatives were identified as the organizational experience of traditional systems; the quality and safety of the water source; the functionality of the irrigation infrastructure; and the favorable effects on the agricultural economy due to the increase in water for crops. A PROAGRO Sustainability and Self-management of irrigation showed, that after three years, only 20% of the irrigation systems presented problems for continuity and sustainability. The irrigation infrastructure is also subject to climate risks such as the decreased water availability due to changes in precipitation patterns, increased evapotranspiration losses due to higher temperature, and general impacts on basin-wide water resources. Most of the irrigated agriculture in Bolivia uses flood or gravity irrigation, which, despite being a traditional system, is inefficient in the use of water. In Municipalities with high risks of drought, gravity/flood irrigation is not a viable alternative, and it must move towards more efficiency. Even though in recent years, technical methods such as sprinkling and drip irrigation have been introduced, only about 9,000 ha uses these systems (which represents 3% of the irrigated area of the country) (National Irrigation Inventory, 2012). There is also rainfed production, that is, production without any irrigation, taking advantage of water availability during the rainy season. For the municipalities of the Valles Macro-region of Bolivia with a high and very high risk of drought, the largest area of crops maintains production without irrigation, which implies high and very high vulnerability for producers. Table 3A illustrates as an example, this situation, for the three main products of the Macro-region (corn, wheat and potato). Performance evaluation studies of irrigation systems conducted in recent years confirm that irrigation efficiency in new and old systems is low (below 20%), infrastructure maintenance is problematic in some cases, and the transition to new irrigated cropping practices and innovation is slow. In this context, the most vulnerable people in the Valles Macro-region are the subsistence farmers with highly vulnerable to degrading landscapes, declining ecosystem functions, increasing climate change effects, and low yields. These factors contribute to place them into a vicious cycle of asset depletion and extreme poverty. Without the financial resources to invest in adopting resilience-enhancing agricultural management, smallholders have severe limitations to address their increasing vulnerability.

[64] Tercera Comunicación Nacional del Estado Plurinacional de Bolivia a la Convención de Naciones Unidas Sobre el Cambio Climático; Autoridad Plurinacional de la Madre Tierra, Año 2020. https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf

[65] Ministerio de Medio Ambiente y Agua (2017). Programación Plurianual y Marco de Evaluación de Desempeño del Subsector de Riego 2017-2020.

Table 3A. Main crops in the Valleys Macro-region of Bolivia

Crops	Irrigation Area (Ha)	Non Irrigation Area (Ha)	Total Area (Ha)	Irrigation %
Corn	12.894	24.633	37.527	34
Potato	10.869	21.413	32.281	34
Wheat	2.110	22.096	24.206	9
TOTAL (ha)	**25.873**	**68.142**	**94.015**	

Source: INFO SPIE, 2013

50. In the Valleys Macro-region, large portion of the ecosystem functions is related to forests, with six types of forests that all together represent 38% of the project area with crucial role for hydrological regulation and provisioning, water infiltration, climate regulation and prevention of soil erosion, flooding and drought. Wetlands is another type of ecosystems in the project area, relevant for their ecosystem function of water and habitat provision to wildlife, although they represent a small area of the Valleys (7,625 hectares). Extreme droughts have been affecting forest ecosystems, consequently causing forest fires and loss of vegetative cover with direct impact on maintaining the capacity for water regulation, the loss of organic matter in the soil and of biological diversity, in many cases endemic to these areas.

51. The Valles Macro region was selected due to the recurrence of extreme climate and weather events[66] (i.e., hydrological drought, torrential rainfall, frost and hail events) and the resulting need to reduce the vulnerability of smallholder farmers' livelihoods. The most vulnerable municipalities (65) in this region were selected using climate vulnerability criteria described below and based on the vulnerability assessment conducted for the region (See Section 8 of Annex 2 – Feasibility study for detailed description). The Valles Macro region covers the watershed Río Grande, Guadalquivir, Azero, Rocha, Mizque, Cachimayo, and Arque-Tapacarí**.** There are 111 Original Community Lands (TCOs) and Indigenous Territories (TIOCs) in the region, which cover around 7.7% of the region. A multi-criteria analysis was used to identify and prioritize the project intervention area among the different regions in the country. A detailed description of the methodology used for the prioritization of the Valles Macro region is provided in Section 8 of Annex 2. Feasibility Study. The criteria used for the prioritization of the Valles Macro region included:

    - *High vulnerability to climate change:* Areas highly vulnerable to drought, frost and hailstorms (Indicator: Level of vulnerability).
    - *Contribution to the basic family food basket of the main cities:* Areas where agriculture is a key livelihood activity (Indicator: Production of more than 60% of the basic family food basket).
    - *Water recharge areas:* Areas with high water recharge, where climate change is likely to impact the aquifer conditions (Indicator: >640 mm/year)
    - *Priority areas for conservation of biodiversity*: Conservation areas in good condition generate ecosystem services, in particular hydrological ecosystem services (Indicator: Level of biodiversity).

52. Once the Valles Macro region had been prioritized, the most vulnerable municipalities to climate change within the region were prioritized based on the results of the vulnerability assessment conducted by FAN in 2018 and described below.[67] Table 4 shows a summary of the project target area with selected municipalities with high and very high vulnerability levels. Figure 6 shows the prioritized municipalities (in blue) within the Valles Macro region and the TCOs and TIOCs (in red).

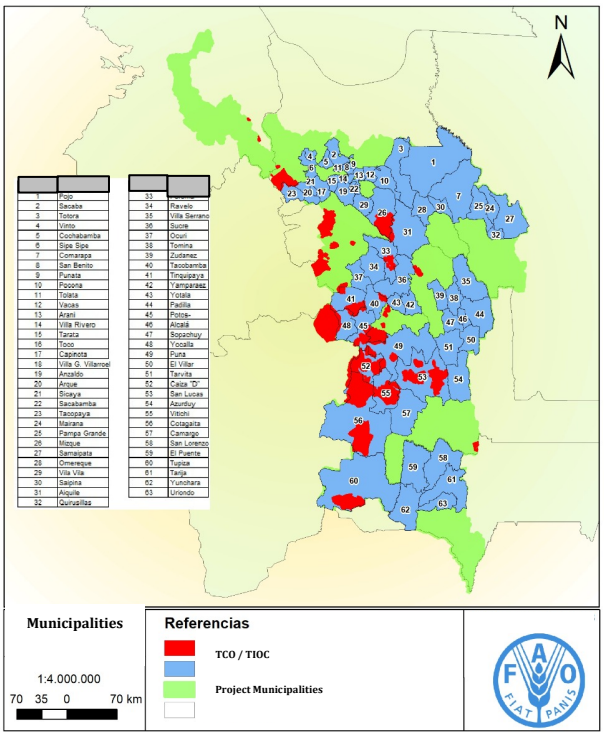
Table 4. Summary of the project target area.

Department	Region or department	Number of municipalities in the project area
Chuquisaca	Center of Chuquisaca region	8

[66] Idem.

[67] FAN (2018). Climate change analysis in Valles Region prepared for the FAO Green Climate Fund Project. Output 5. Climate vulnerability analysis. Santa Cruz de la Sierra: FAN.

	North Chuquisaca region	5
	North and South Cinti provinces	2
Cochabamba	Cono Sur region	8
	Cochabamba Metropoli region	4
	Andean region of Cochabamba	4
	High Valles region	8
Potosí	North and South Chichas Provinces	3
	Gran Centro of Potosí region	6
	North of Potosí region	2
Santa Cruz de la Sierra	Santa Cruz valleys	7
Tarija	Héroes de la Independencia province	4
Total		65



e. Climate vulnerability and impacts in the Valles Macro region

53. A vulnerability assessment[68] was conducted for the Valles Macro region in order to identify the level of vulnerability of the municipalities. The assessment considered: (i) climate exposure, (ii) sensitivity to climate change, and (iii) adaptive capacity to impacts, described by 13 indicators. The baseline used is the year 2000 with climate projections using RCP 4.5 for 2050 presented in the section above (Figure 3, 4 and 5). Table 5 summarizes the indicators. For detailed information on the methodology for vulnerability assessment, see Section 8 of Annex 2. Feasibility study.

Table 5. Criteria used for the vulnerability assessment and prioritization of project sites.[69]

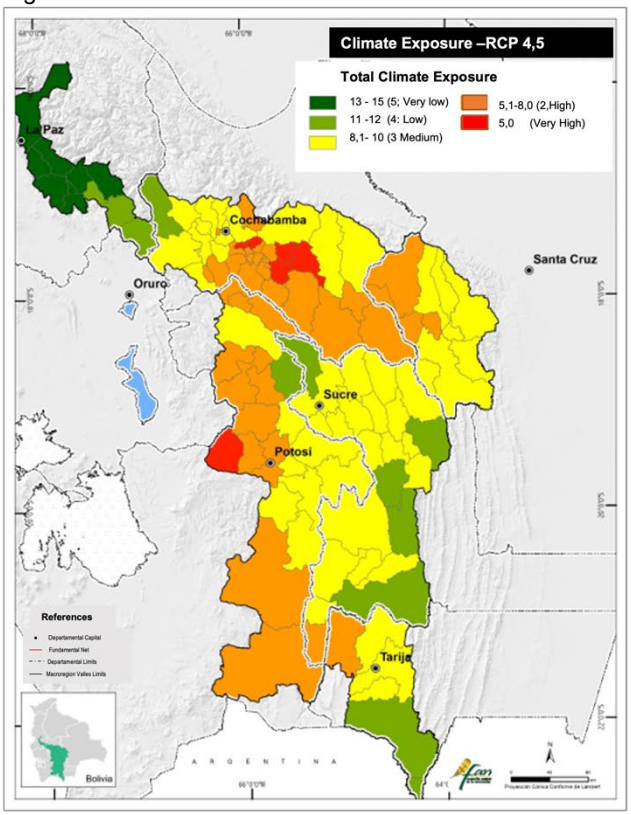
Vulnerability Component	Criteria
Exposure	• Change in the annual water balance between the baseline and the future scenario • Change in the water balance in February and August between the baseline and the future scenario
Sensitivity	• Erosion risk • Drought risk • Biomass • Area under irrigation

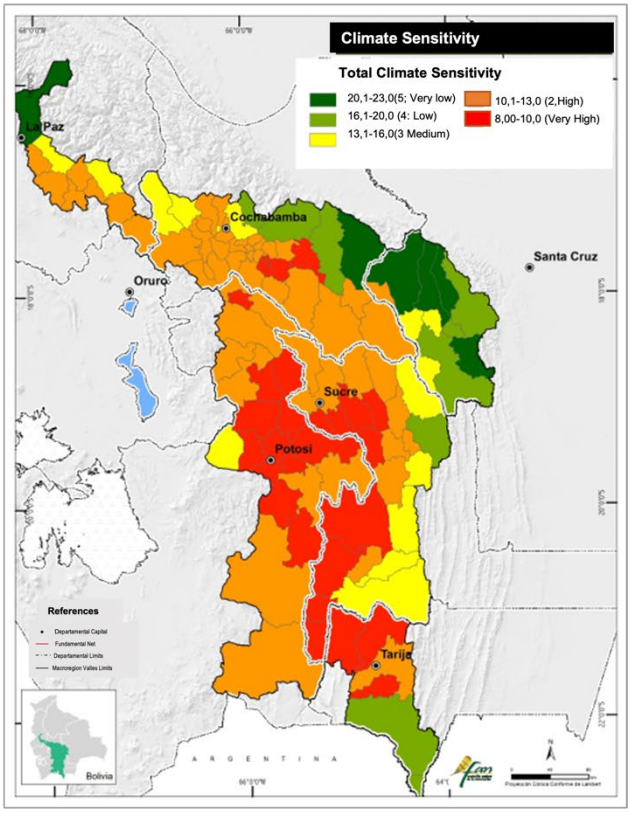
[68] FAN (2018). Climate change analysis in Valles Region prepared for the FAO Green Climate Fund Project. Output 5. Climate vulnerability analysis. Santa Cruz de la Sierra: FAN.

[69] Idem.

Adaptive capacity	• Area of cropland under irrigation • Percentage of the population living in poverty • Economic activity in the primary sector • Availability of electricity • Access to piped drinking water • Number of tractors per 100 people in an Agricultural Production Unit • Number of wooden ploughs compared to number of mechanized ploughs

54. **The combination of very high exposure and sensitivity with very low adaptive capacity translates into very high vulnerability of farmers, particularly in north Potosí, south Cochabamba and west Chuquisaca.** Figures 7 maps the exposure, climate sensitivity and adaptive capacity of the municipalities in Valles Macro region based on climate projections using RCP 4.5.





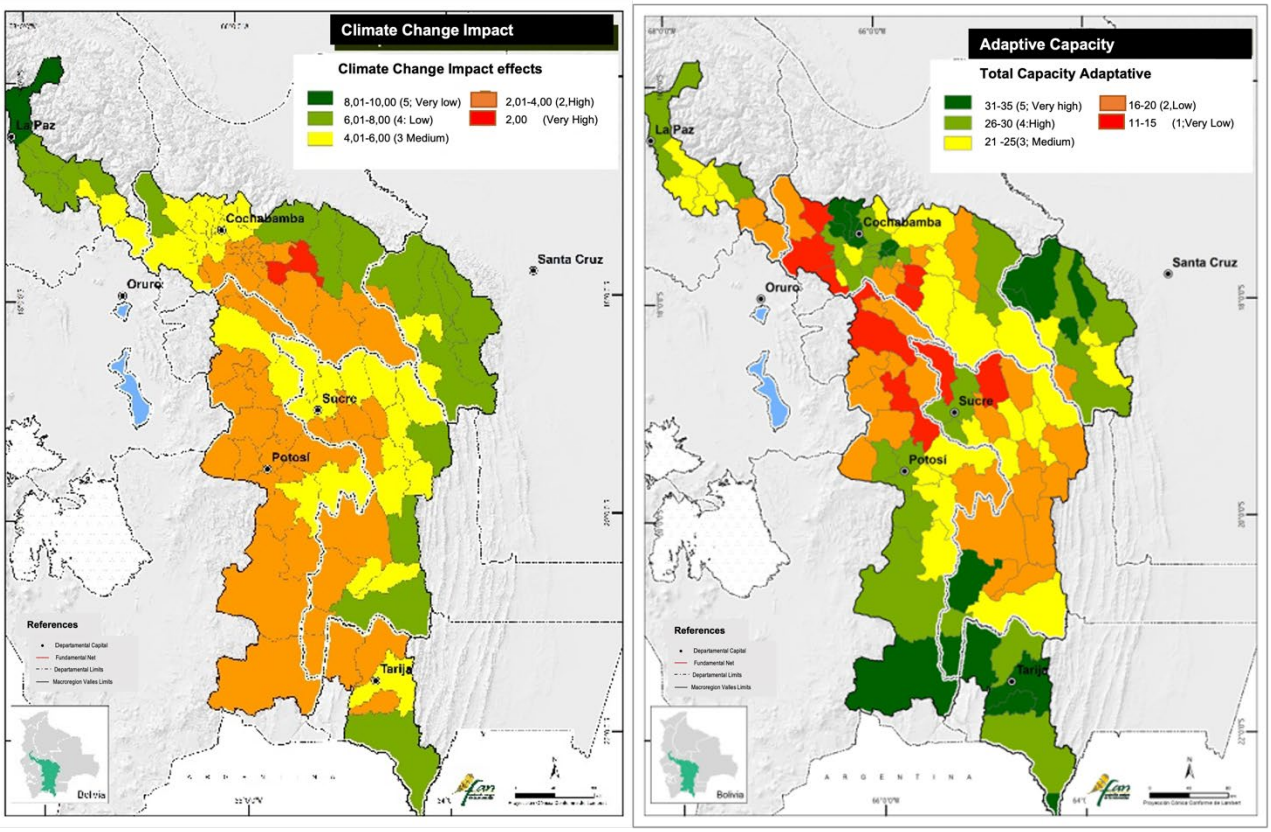


Figure 7. Vulnerability of agricultural production to climate change in the municipalities in Valles Macro region under RCP 4.5: (a) Exposure, (b) Climate sensitivity, (c) Climate impacts, and (d) Adaptive Capacity

55. The vulnerability to the effects of climate change under the RCP4.5 scenario indicates that the municipalities of southern Cochabamba and northern Potosi will suffer high impacts because they are highly exposed and more sensitive to climate change. In addition, their adaptive capacity is low, which further contributes to increased vulnerability levels. The ten most vulnerable municipalities of the Macro region valleys include (*Figure 8*): Pocona, Vacas, Cuchumuela, Sacabamba, Alalay, Tinguipaya, Acasio, Arampampa, Tacobamba, and Ocuri. Based on the results from the vulnerability assessment, the 65 municipalities with high and very high vulnerability were prioritized (*Table 4).*

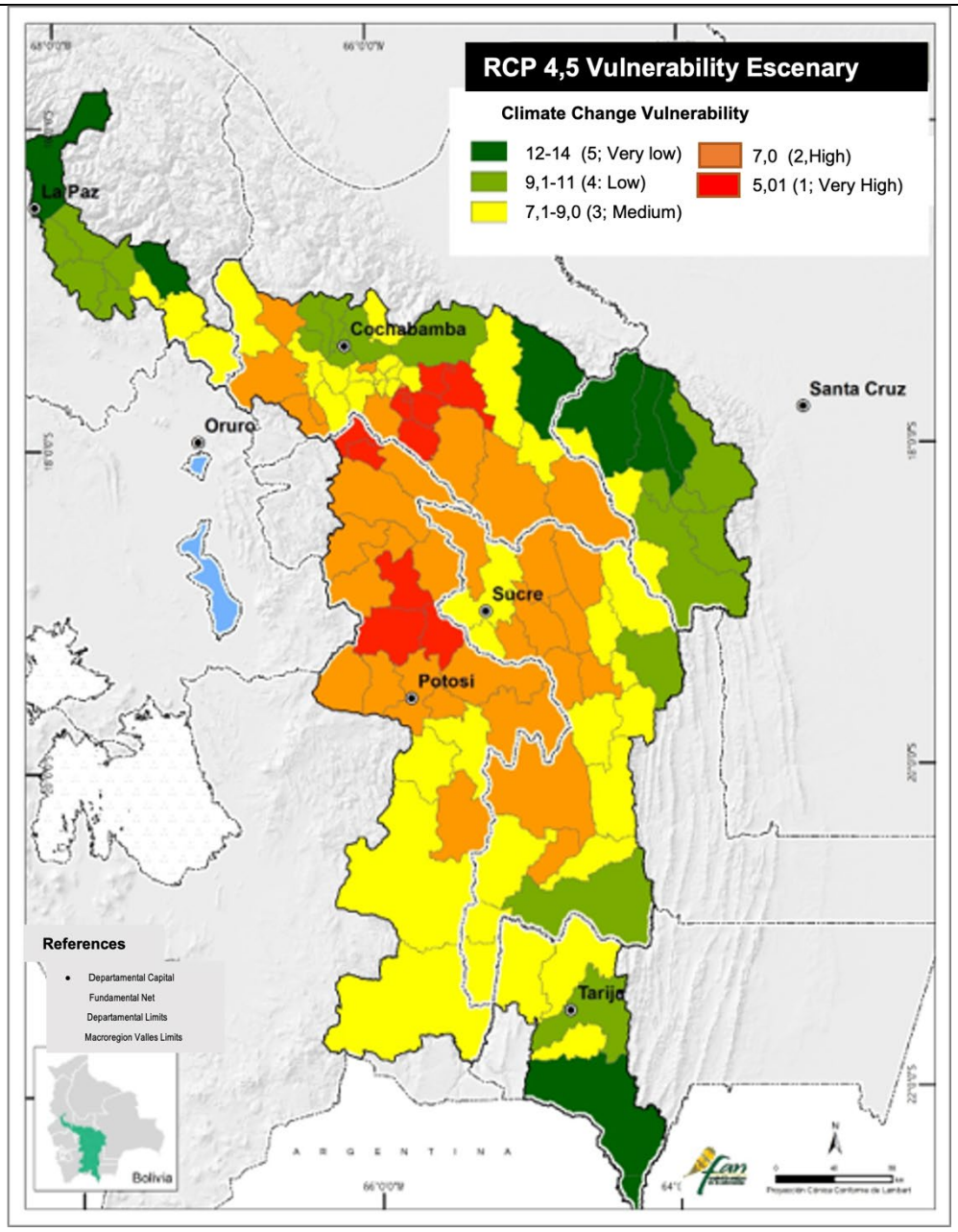


Figure 8. Vulnerability to climate change effects under RCP 4.5 scenario

56.

While there are no recent estimates of the potential economic impacts of climate change on the agricultural sector in Bolivia, an IADB/CEPAL study from 2014 estimates that the cost of inaction will result in an impact between 2.87% and 4.75% of GDP for the period 2010 – 2100 under scenario A2.70 Table 6 presents a summary of the identified climate hazards, potential impacts and project adaptation solutions.[71] In order to specify the impacts of climate change on water supply, the effects of changes in land use and land cover resulting from anthropogenic activities over the period 2010 – 2020 were analyzed. This was done by simulating the average hydrologic cycle for the climate of 1980-2015 combined with the land cover situation of 2010 and comparing this with the hydrologic cycle for the same climate combined with the landcover situation of 2020. While there are significant changes in land cover over the period 2010 – 2020 (for example an increase in agricultural area of 3.72 % in the Plata basin), the changes in modelled discharge are below 0.01% (in the Plata basin

[70] BID/CEPAL (2014). La economía del cambio climático en el Estado Plurinacional de Bolivia 2014.

[71] FAN (2018). Climate change analysis in Valles Region prepared for the FAO Green Climate Fund Project. Output 5. Climate vulnerability analysis. Santa Cruz de la Sierra: FAN.

an increase in discharge of 0.004% is modelled). The conclusion from these analyses is that the changes in discharge as modelled in the climate change scenarios can be attributed primarily to Climate Change. The results of this analysis are included as an annex 3 to the Feasibility Study.

Table 6. Key climate change hazards, associated impacts and project adaptation interventions.

System	Climate risk	Evidence of impacts	Adaptation interventions	Adaptation benefits
Agriculture production systems (subsistence farming, small scale farming)	Increasing temperatures and decreasing precipitation reduce crop production mainly in the central part of the study area.[72]	• Rising temperatures will alter the suitability of areas for specific crops and cropping systems (FAN, 2017) and decrease crop yields, e.g. maize (Tito et al, 2018). • Beyond a certain point, higher air temperatures adversely affect plant growth, pollination, and reproductive processes (Klein et al., 2007; Sacks and Kucharik, 2011)[73]	• Livelihood diversification (ensuring that farmers are not only dependent upon production of agricultural crops for their livelihood).[74] • Production and multiplication of heat tolerant crops (e.g. sesame, millet, sorghum, quinoa) [75] • Agroforestry – Canopy cover reduces evaporation from direct sunlight and by decreasing air and soil surface temperature[76] • Agroecology practices, that include conservation agriculture such as[77]: ➢ Optimizing crop calendars ➢ Short cycle variations	Avoid losses of livelihoods for farmers by diversification of their income generation (also focusing on the value chain of honey) can lead to overall increase in income.[78] Farmers have adapted climate change adaptation measures to guarantee agricultural production under changing climatic conditions. Therefore, leading to improved food security. Increase in income from the reliable sale of quality agroecological products.
		Rising temperatures result in soil degradation: the availability of nutrients decreases, resulting in a loss of soil biodiversity[79]. Changes in runoff would cause different effects in the region. Uncovered or sparsely vegetated slopes would be more prone to erosion due to increased runoff[80]	• Soil management with the aim to increase soil fertility. This includes the application of: contour cropping practices for erosion control / crop rotation / grass strips / use of bio-fertilizers • Agroforestry: Reforestation and revegetation of erosion prone areas that improve soil health [81] • Conservation agriculture – implementation of practices that reduce soil erosion, increase macronutrient deposition and infiltration by reducing surface runoff: Half-moons, zaï pit systems[82] • Protection and natural regeneration on degraded slopes and slopes and in the headwaters of watersheds by applying *agroforestry practices* that stabilize the ground, sustain soil moisture and reduce soil erosion[83]	Increase the agricultural production by improving the soils biodiversity and availability of nutrients. Enhanced habitats for biodiversity and the delivery of ecosystem services. Avoiding further losses of soil degradation and leading to less erosion. Therefore restoring the soils not only for biodiversity purposes (restoring ecosystems) but also for the purpose of agricultural use.

[72] Fundación Amigos de la Naturaleza. 2017. Producto 1. Efecto del cambio climático en el área de influencia del proyecto. FAO.
[73] Hatfield, J.L., Prueger, J.H. 2015. Temperature extremes: Effect on plant growth and development. https://reader.elsevier.com/reader/sd/pii/S2212094715300116?token=0E5FBC34B3AC9F32390CF72D23171FC21B02BB992A9168D52A82770F0C4262FEB7540832B1A83ACCF58D962296FBB978&originRegion=us-east-1&originCreation=20220216183036
[74] Alvar-Beltrán, J., Elbaroudi, I., Gialletti, A., Heureux, A., Neretin, L. Soldan, R. 2021. Climate Resilient Practices: typology and guiding material for climate risk screening. Rome, FAO.
[75] Idem
[76] Idem
[77] Idem
[78] Sardar, Asif & Kiani, Adiqa & Kuslu, Yasemin & Bilgic, Abdulbaki. (2020). Examining the Role of Livelihood Diversification as a Part of Climate-Smart Agriculture (CSA) Strategy (İklim-Akıllı Tarım stratejisinin bir parçası olarak geçim çeşitliliğinin rolünün incelenmesi). 79-87. 10.17097/ataunizfd.604937.
[79] FAO. 2016. Estado Mundial del Recurso Suelo. Resumen Técnico
[80] Idem as 85
[81] Alvar Beltran, et al. Idem Footnote 69
[82] Idem as 93
[83] Idem as 95

		As a result of the reduced precipitation and increased temperatures, the project area suffers from deficit of surface water, some areas more than others, particularly for irrigation, this information will inform the 2 different adaptation measures as described in the next column. [84] The number of droughts has been increasing over the last few decades. One drought alone, from 2016, cost Bolivia 450 million USD and affected 665,000 people living in the country[85]. A drought in 2019 damaged more than a third of the land cultivated in soybeans (350,000 of 1.02 million hectares of land sown with soybeans), resulting in losses over 168 million USD[86].	<u>Adaptation measures for regions with sufficient availability of surface water for irrigation:</u> Climate-proof existing irrigation systems to improve efficiency (drip and sprinkler irrigation technologies, lining of irrigation canals, etc., page 147 of annex 2). These systems are intended to increase water-use efficiency by providing sufficient water according to the crop[87] <u>Adaptation measures for regions with insufficient availability of surface water for irrigation:</u> (a) Optimizing crop calendars[88] (b) changing the existing crops to crops with lower water requirements e.g. quinoa y sorghum[89] (c) ensuring irrigation is based on rainwater harvesting (d) application of hydrogel to maintain soil moisture (provision and implementation)[90]	Increased water efficiency by the farmers for irrigation and thus ensuring the agricultural production Farmers are able to continue the production of crops, even without sufficient surface water. Efficient water use reduced pesticide use and improved soil health can lead to an average increase in crop yields of 79%[91].
		Corn and potato production decreased by more than 87%, mainly as a result of new pest attacks. (Tito et al, 2018). Warmer and drier conditions favour disturbances by insects, whereas warmer and wetter conditions favour disturbances from pathogens, with increasing pest risk[92].	Establishment of agroecological management at the family and community level for integrated pest management. To reduce the impact of agricultural pests, examples of modified cropping practices and adaptive management strategies include: (I) planting different crop varieties; (II) planting at different times of the year to minimize exposure to pest outbreaks; and (III) increasing biodiversity at field margins to increase the number of natural enemies[93]	Reduced impacts of pests will lead to increased agricultural production and increased resilience of the farmers to the outbreak of pests.
	More frequent and intense hailstorms: According to the perception of rural producers, hailstorms have	Evidence from the Central Valley of Tarija, demonstrated that in the last four agricultural seasons, frost and hail resulted in a reduction of	Provision and implementation of anti-hail nets[96]	Increased resilience of the farmers to hailstorms, and therefore securing continued crop production and the food security of the country.

[84] Villazon, M. 2021. Línea Base de Balance Hidrológico. FAO en el área de influencia
[85] https://reliefweb.int/sites/reliefweb.int/files/resources/adsr_2016.pdf
[86] https://www.efe.com/efe/english/business/bolivian-farmers-crushed-by-drought-and-debt/50000265-3929408
[87] Alvar-Beltrán, J., Elbaroudi, I., Gialletti, A., Heureux, A., Neretin, L. Soldan, R. 2021. Climate Resilient Practices: typology and guiding material for climate risk screening. Rome, FAO
[88] Idem as 97
[89] Idem as 97
[90] Cortés, B., Ramírez, B., Xiomara, I., Eslava., B, Francisco., Gerard, R.N. 2007. Evaluación de hidrogeles para aplicaciones agroforestales. Ingeniería e Investigación, vol. 27, núm. 3, pp 35-44. Universidad Nacional de Colombia Bogotá, Colombia.
[91] FAO. 2016. Estado Mundial del Recurso Suelo. Resumen Técnico
[92] IPPC Secretariat. 2021. Scientific review of the impact of climate change on plant pests – A global challenge to prevent and mitigate plant pest risks in agriculture, forestry and ecosystems. Rome. FAO on behalf of the IPPC Secretariat.
[93] Skendžić, S.; Zovko, M.; Živković, I.P.; Lešić, V.; Lemić, D. The Impact of Climate Change on Agricultural Insect Pests. Insects 2021, 12, 440. https://doi.org/10.3390/insects12050440
[96] Figuerola, 2015. Project for the exploitation of apple trees in high altitude areas for the production of maximum quality fruits, in Burgo de Osma (SÓRIA). Higher Technical School of Agricultural Engineering. University of Valladolid. 494p.

	become frequent in the last ten years in the puna area (UNDP, 2011).	between 12% and 39% of total production.[94] The records shows that 2,012 events in the period between 2010 - 2021, of this total, 89%, represent four types of extreme events: floods (34%), hailstorms (25%), frosts (15%) and droughts (14 %). The summer agriculture season (October 2020 to April 2021) and winter (May to September 2021) extreme events have affected 122,939 families. In the 2020-2021 agriculture season, frosts occurred with the highest incidence, followed by floods, hailstorms, and droughts[95].		
	More frequent and unpredictable frost events.	According to reports from rural producers themselves, frosts can create losses of 50% of production or losses of up to 100% of crops. Although frosts are a recurring phenomenon, the changes observed in climate variability in the last decade mean that they are occurring unexpectedly and in areas where they have not occurred usually.[97]	Provision and implementation of thermal blankets[98]	Increased resilience of the farmers to frosts, and therefore securing continued crop production and the food security of the country.

Policy context

57. The NDC (2016) highlights the need for an integrated approach (as adopted as well by RECEM Valles project) to address climate vulnerability in the water and agriculture sectors. Figure 9 shows the articulation of different variables associated with the storage of water and its impact on increasing access to water and increased agricultural production, while promoting the growth of agricultural GDP and reducing poverty by unsatisfied basic needs, and including community management of social organizations as a fundamental tool for achieving resilience related to water.

[94] Estudio de Identificación, Mapeo y Análisis Competitivo del Cluster de Uvas, Vinos y Singanis en Bolivia; CAF Alejandro Paniagua, 2012.
[95] Government of Bolivia, 2020. Third National Communication on Climate Change to UNFCCC. Available online: https://unfccc.int/sites/default/files/resource/NC3%20Bolivia.pdf
[97] https://www.portalfruticola.com/noticias/2017/08/30/heladas-tipos-medidas-prevencion-manejos-posteriores-al-dano/
[98] https://www.portalfruticola.com/noticias/2017/08/30/heladas-tipos-medidas-prevencion-manejos-posteriores-al-dano/

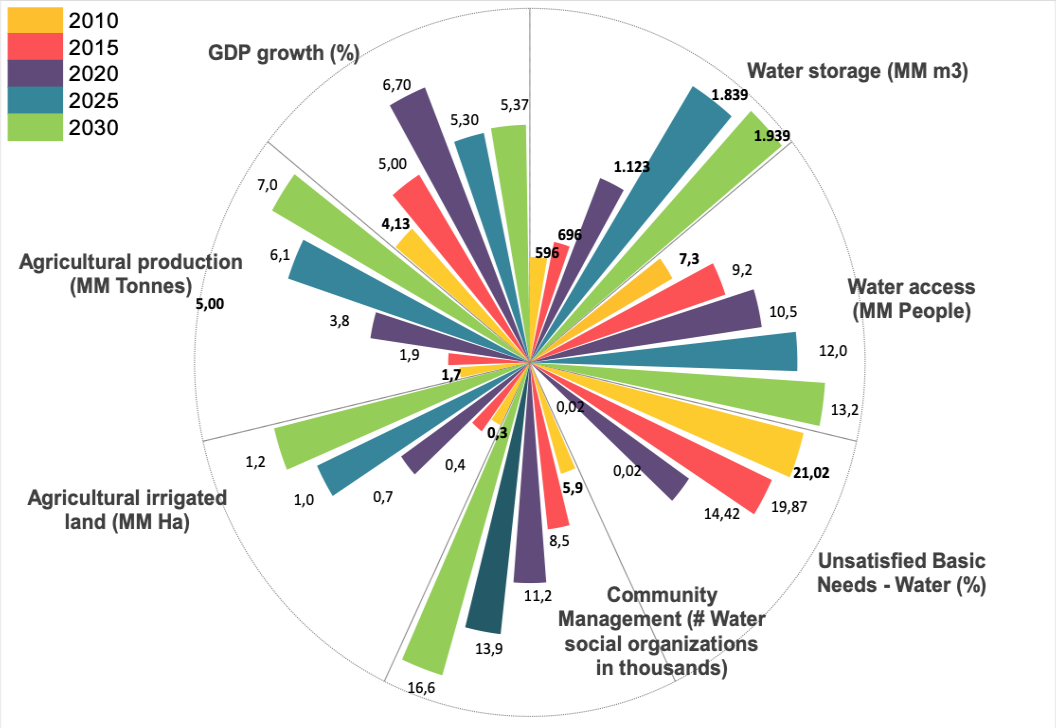


Figure 9. Reducing water vulnerability and increasing adaptive capacity in water.[99]

58. Bolivia's overarching policy instrument guiding the national actions on climate change is the Nationally Determined Contributions (NDC). The country has formulated its NDC and submitted them to the UNFCCC in 2016, setting far-reaching goals in three sectors: water, energy and forests for the period 2015 –2030.[100] Table 7 shows how the RECEM Valles project will contribute to the achievement of the NDC targets. A detailed description of the policy and institutional framework can be found in Section 9 of Annex 2. Feasibility Study.

Table 7. Overview of the contribution of the project to achieving NDC targets.

Key NDC priorities and targets relevant to the project	Project's contribution to achieve the targets
Significant progress has been made in regard to social participation for local water management. Increasing to 80% of organizations focusing on the social management of resilient water systems compared to the 35% found in 2010.	RECEM Valles project (Outputs 2.2, 3.1, 3.2, 4.3) will strengthen the capacity of local actors and enhance local governance structures for 8 watersheds to implement climate adaptive practices for water resource management.
Water vulnerability has been reduced to 0.51 to 0.30 units by 2030 compared to 2010. This is measured through the National Index of Water Vulnerability of the country which considers aspects related to exposure (threats), the sensitivity of water distribution systems (water scarcity) and adaptability.	RECEM Valles project will collaborate with the GoB in the design of the National Index for Water Vulnerability and conduct a pilot implementation in the Valles Macro-region. RECEM Valles project (Output 2.1) will climate-proof irrigation systems in at least 4,448 hectares by 2027, to optimize the efficient use of water, reduce the risks of droughts and low rainfall as a result of climate change.

[99] Bolivia's NDC available online at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Bolivia%20(Plurinational%20State%20of)%20First/INDC-Bolivia-english.pdf
[100] Idem.

29 million hectares with ecosystem functions preserved and restored;	RECEM Valles project (Output 3.1) will support smallholder farmers, and public-private institutions in the project's area to adopt practices to preserve and restore environmental functions with an integral and participatory micro-watershed management approach for water security in **17,510** hectares and 1.3 million hectares of forests and forest lands by 2027.
4.5 million forested and reforested hectares	

59. Other relevant policies include Law No. 745 for the “Decade of Irrigation 2015 - 2025"[101]. The Law defines strategies to be employed to promote irrigation, implement water storage systems, introduce multi-purpose family water harvesting systems, recycle wastewater for irrigation, and promote state of the art irrigation practices such as solar pumps, drip irrigation, and precision farming using tablets and agrometeorological information.
60. Furthermore, a series of decrees have recently been approved to implement the National Forestry and Restoration Programme and “Our Forests” Programme, establishing the institutional and operational framework required to achieve zero illegal deforestation by 2020. Additionally, the Plurinational Political and Strategy and Action Plan for the Integral and Sustainable Management of Biodiversity 2019 – 2030 was approved in 2019 as the instrument that guides the management of biodiversity under the principles of Harmony with Mother Earth and Living Well. The project contributes directly to the implementation of the above regulatory framework.
61. Moreover, in line with Law 300 Framework on Mother Earth and Integral Development for Living Well, the processes for Development of Sustainable Production Systems within Territorial Management should increase the resilience in the face of climate change, fostering the implementation of the Joint Mechanism for Adaptation and Mitigation (JMAM). The same goal includes the implementation of integral and sustainable forest management and the management of other components of Mother Earth, to contribute to the JMAM. The JMAM is Bolivia's proposal for a strategic entity (under the UNFCCC) and an approach (at the national level) for implementing non-market schemes for reducing deforestation and forest degradation, halting land deterioration, enhancing ecosystem functions, and promoting sustainable production systems, while taking indigenous peoples' knowledge into account, in order to contribute to climate change mitigation and adaptation of ecosystems and people.[102] The RECEM Valles project's emphasis on ecosystem function enhancement through agroecological and integral watershed management (including restoration with native species) and the incorporation of traditional knowledge is a direct application of the Bolivian JMAM proposal and corresponding national regulatory framework, which will provide a clear example of JMAM implementation and empirical case with national and international relevance.
62. In Bolivia, the New Political Constitution of the State and the Framework Law of Autonomies and Decentralization provides new autonomous levels to subnational government. Under these new decentralisation regulations, the Autonomous Departmental Governments (GAD) are in charge of i) the implementation of the general policies of conservation / protection of basins, soils, water resources, forestry and forests; ii) the preparation, financing and implementation of irrigation projects jointly with the central government; iii) the implementation of the irrigation institutional framework provided for by law; and iv) the design and implementation of hydraulic projects in accordance with the regime and policies of the central government.
63. The Autonomous Municipal Governments (GAM) are responsible for the implementation of the general policies of conservation of soils, forest resources and forests, without authority with regard to basins, despite their important role in territorial management. Municipalities are given the authority to develop, finance and implement irrigation and micro-irrigation projects, in addition to designing, implementing and managing projects for the use of water resources. This is done in coordination with the central government, with the exclusive mandate of establishing micro-irrigation systems in a coordinated manner with indigenous peoples and farmer communities. In this institutional context, the Federation of Associations of Municipalities (FAM) – as the organisation that brings together urban and rural municipalities – coordinates with the entire group of GAMs involved in the project. As a result, FAM is a EE in the project governance structure (via the Project Steering Committee, PSC, and Technical Committee, TC) as well as a co-founding entity (see Figure 10). Such roles are consistent with FAM objectives of supporting the solidarity and equitable development of GAM, capacity building and information sharing processes, municipal management strengthening, and the creation and coordination of medium and long-term plans in accordance with the Plurinational State of Bolivia's integral planning.[103]

i. Related projects/interventions

[101] Government of Bolivia, 2015. Law No.745. Available online: http://extwprlegs1.fao.org/docs/pdf/bol150710.pdf

[102] Plurinational State of Bolivia (2012). Proposal for the development of the Joint Mitigation and Adaptation Mechanism for the integral and sustainable management of forests. Available at: https://unfccc.int/files/bodies/awg-lca/application/pdf/3_background_information_mecanismo-medium_(1)_bolivia.pdf

[103] FAM (n.d.) Objetivos y fines. Available at: https://fam.org.bo/quienes-somos/

64. Different programmes and projects have been implemented by the Government and other institutions in the Valles Macro region. Emblematic projects, funded by the National Treasury of the Nation, international cooperation, and own institutional funding from natural resources usage fees and charges, include:[104]

- Ministry of Environment and Waters: (i) Our Forest, (ii) National Forest Programme, (iii) National Afforestation and Restoration Program, iv) FONABOSQUE ESFOR GAM – Research in Biotechnology, v) FONABOSQUE GAM – Agroforestry systems, (vi) FONABOSQUE GAM – Protection of water sources, (vii) FONABOSQUE GAM – Restoration of water sources, and (viii) FONABOSQUE GAM – Conservation of water sources.
- Ministry of Rural Development and Lands: (i) The National Fruit Program. Additionally, institutions have been created for the provision of water and irrigation systems, including (a) The Drinking Water and Sanitation Control and Supervision Authority, (b) the National Service for the Sustainability of Basic Sanitation Services and Water Executing Entity, (c) MiRiego, and (d) My irrigation Program. Further information on the project interventions and complementarity with RECEM-Valles is included in Section 12 and 13 of Annex 2. Feasibility Study.
- International organisations: FAO: Resilience of Family Farming includes (i) National Strategy for Increasing Production, ii) Promoting resilience of family farming, and (iii) Food and Nutrition Education. The current project design is informed by the lessons learned from these projects.

65. Some of the proposed activities in the RECEM-Valles project are based on the investments implemented by Bolivian Central Government over the period 2006-2017 to address water scarcity, including the MiAgua I, II and III programme. Particularly, the project will establish synergies with the MiRiego Programme in two ways: i) filling the gap of on-farm water provision, due to the large-scale characteristics of irrigation systems deployed under MiRiego, and ii) climate proofing irrigation to enable climate-resilient agriculture. In particular, GCF financing will support small-scale technologies for water use efficiency, including irrigation scheduling tools, which are not considered as part of the current irrigation projects but will significantly contribute to supply water for irrigation when needed, especially during drought periods and thus increase yields and lead to increased food security and income of small scale farmers. Lastly, the RECEM-Valles will scale up the investments made under MiRiego by supporting integral and participatory watershed management in the highly vulnerable Macro region, using a climate-resilient approach that enables sustainability in the provision of ecosystems functions and services. Addressing water scarcity by climate proofing irrigation, enhancing watershed ecosystem functions and services, and applying an ecosystem-based approach is in line with the Bolivian PDES and will contribute to the Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth and JMAM. Due to the unreliability of past irrigation systems, the country's policies were reformulated with establishment of the MiRiego Program to incorporate a Comprehensive Technical Assistance (ATI) package to improve irrigation management.

66. Bolivia has also received climate related funding from The International Bank for Reconstruction and Development (IBRD) and the Inter-American Development Bank (IADB) under the Pilot Programme for Climate Resilience, focusing on integrated water resource management and Financial Products to Promote Climate Resilience. These initiatives have demonstrated good practices in other areas of Bolivia and this project will build upon the foundations created regarding integrated water resource management and financial products, In particular, it will coordinate with the National Climate and Water Information System and the National Drought Monitor. Further information regarding other climate adaptation interventions and complementarity with RECEM-Valles is included in 12 and 13 of Annex 2 - Feasibility Study.

B.2 (a). Theory of change narrative and diagram (max. 1500 words, approximately 3 pages plus diagram)

Barrier analysis

67. The project is specifically tailored to address and overcome institutional, financial, and information barriers linked to climate change that inhibit resilience building by vulnerable populations. At the local level, these barriers are socio-technical and organizational in nature rather than being purely economic or technical, reflecting the complexities of climate change. Unlike previous projects, RECEM Valles addresses such barriers using an integral (i.e., socio-ecological and institutional) and multi-scale (i.e., plot, community, watershed, and territorial) approach to climate adaptation. Since the barriers are transdisciplinary in nature, the project takes a transdisciplinary approach to addressing the intertwined social, technical, organizational, and economic challenges through strategies on agroecological management, capacity building in climate-resilient restoration, climate-proofing irrigation and water management, and locally tailored financial resources. Table 8 outlines the identified barriers and the project's approach to address them.

[104] Every year, it is issued the Financial Law that has the objective of approving the General State Budget of the public sector for fiscal management. Such budget is elaborated by the Ministry of Economy and Public Finance (MEFP) in coordination with the Ministry of Planning and Development (MPD) based on the resources allocated by the General Treasury of the Nation (TGN) to public sector entities for their regular expenditure and/or investment the projects authorized. The budget assigned to each public entity is organized by each public entity according to the official budget lines of the budget classifiers, issued annually by Ministerial Resolution by the MEFP through the Viceministry of Budget and Fiscal Accounting. The inscription of annual budget of each public entity is approved by the MEPF. Once approved, reallocation of funding is possible only prior evaluation and authorization of the MEPF. Unexecuted funds are reverted to the TGN.

68. **Smallholder farmers have limited technical support to apply the appropriate technical know-how and innovation to adapt traditional agroecosystems to increasing climatic variability.** Smallholder farmers have developed locally adapted agricultural management and cropping systems over millennia and these systems have been finely tuned to historical constraints and opportunities. However, such practices are not enough to cope with current and projected climate change in the Valles Macro region. Besides, the agricultural assistance to farmers is centralized and is based on the conventional model for extension services and agricultural practices, which often provides inadequate support. Moreover, the extension services cannot reach farmers due to a limited number of technical staff.
69. **Smallholder farmers lack support for marketing, selling opportunities for their agricultural produce, and opportunities to participate in other stages of the agricultural value chain.** Production and commercialization are the key stages of the agricultural value chain for smallholder farmers (i.e., those vulnerable to climate change and with an average of 2 ha of agricultural land). Smallholders' access to markets is a critical factor affecting poverty and food insecurity as a result of unstable market access or low-income return (mainly due to transportation expenses combined with low and unfair selling prices). A related barrier is the lack of post-harvest management of produce, which is an important value chain stage where many smallholders could benefit from collective infrastructure, such as harvest collection and handling facilities. Moreover, the lack of timely market information on pricing, demand, and market trends and limited management skills keep smallholder farmers from equitably access and reduce their benefit from local, departmental, and national markets. Despite government efforts to improve the agricultural marketing systems, this remains a challenge for smallholder farmers.
70. **Smallholder farmers lack appropriate and efficient on-farm water management practices and infrastructure to adapt to climate change.** Smallholder farmers in the Valles Macro region have experience water shortages due to prolonged periods without rains and lack adequate on-farm irrigation systems. Roughly one third of agricultural land in the project area is not irrigated. Insufficient irrigation coverage and inadequate water use technologies result in low agricultural productivity.
71. **Limited access of smallholder farmers to financing to build resilience.** Smallholder farmers tend to have little or no access to formal credit, which limits their capacity to invest in the technologies and inputs they need to plan for anticipatory action to increase their resilience to climate change and reduce food insecurity and poverty. Financial institutions interested in serving this market face a myriad of risks and challenges associated with agricultural production and lending, including seasonality and the associated irregular cash flows; higher transaction costs; and systemic risks, such as floods, droughts, and plant diseases. Financial service providers (i.e., banks, microfinance institutions, and insurance companies) are thus discouraged from lending to farmers. Moreover, farmers have had challenges entering markets, have poor access to agricultural technologies, and lack critical agricultural/livestock advisory and extension services. Additionally, smallholder farmers do not protect their investments in productive activities through either conventional index-based agricultural insurance or innovative index-based insurance products due to the lack of an adequate insurance product meeting their needs. Currently, financial services in Bolivia do not consider the granting of credits with unconventional guarantees and barely consider vulnerability to climate change, nor areas of vulnerability to food insecurity. As a result, smallholder rain-fed farmers have very limited access to finance and opportunities to improve their production. This has prevented investments in land preparation, the ability to have climate-resilient production practices (e.g., rainwater harvesting), and has kept many families (especially single female-headed households) in continuous cycles of poverty and repeated food insecurity. Consequently, with high levels of uncertainty and risks in agricultural production, farmers face challenges in accessing and participating in markets under stable and fair conditions. Lack of stable access to markets is the result of reduced volumes of harvest, absence of collection and handling facilities (that could contribute to increasing the volume supplied jointly at communal or association levels), and inadequate infrastructure (e.g., roads and their accessibility) to transport the produce to markets, among other factors. **Lessons from previous initiatives on establishing financing mechanisms for smallholder farmers in Bolivia include: (1)** One of the mechanisms for transferring risks from the producer and financier to third parties is insurance. However, although in Bolivia and the countries of the Andean region some state initiatives have been implemented for subsidized agricultural insurance to cover catastrophic weather risks, the scope is still limited and confined to the poorest strata, mainly subsistence farmers, thus leaving out an important segment of producers whose activities are more linked to commercial purposes. The development of a private supply of agricultural insurance is still incipient and has been hampered by a number of factors, among which the following stand out: (i) Moral risk on the part of the insured, (ii) scarce information on data yields, temperatures, rainfall and incidence and frequency of climatic phenomena, as well as the high cost of obtaining and processing the information, (iii) lack of knowledge and understanding on the part of the farmers regarding how insurance works, (iv) high cost of verification in the event of the occurrence of a risk event, (v) high frequency of occurrence of climatic events and covariance of agricultural risks. **(2)** Within the framework of this innovation process in agricultural insurance, the recommendations refer to the development of the following: (i) Indexed agricultural insurance, based on information from weather stations on rainfall and air temperature, which will make it possible to foresee the potential occurrence of catastrophes and eliminate the need for field verification with adjusters, in addition to paying indemnity directly to the region's producers. As verified by the project financed by the World Bank through FIDES. (ii) Agricultural insurance based on indexes using atmospheric circulation data provided by satellites, for which data studies are being conducted and indexes are being analyzed to determine indemnity parameters.
    The project will provide technical support to INSA to develop an indexed agricultural insurance product that suits the needs of the small-scale farmers.
72. **Inter-institutional coordination takes place at regional level, without addressing the needs of smallholder farmers and producer associations.** The MiRiego Programme is a national programme implemented by the central government which has a wide coverage of irrigation infrastructure; however, there are two limitations: (i) irrigation programmes have focused on a centralized administrative approach in providing physical infrastructure and equipment and (ii) normative constraints that bans

State infrastructure interventions to private actors (i.e. transfer of service like on-farm irrigation), including smallholders. Accordingly, in terms of small-size infrastructure, there is a gap between the infrastructure built by the central government and that needed by the smallholder to transport water to their farms along the last phase of distribution of water for irrigation.

73. **Lack of systematic and long-term monitoring and evaluation processes, climate data and best practices in adaptation**. One of the challenges in government is that monitoring and evaluation of community programmes or projects are not well coordinated or planned, or they do not adequately inform planning, policymaking and budgeting decisions. This results in government interventions missing the opportunity to improve the functioning of adaptation interventions. Climate data, in particular on frosts and hailstorms, is scare and often monitored on a regional scale, which is not always relevant for specific local needs for timely and accurate information. This is a constraint in developing local adaptation solutions.
74. **Lack of integral and participatory micro-watershed management skills and planning coordination to guide climate resilient watershed restoration and conservation practices**. In general, there is a lack of planning instruments at micro-watershed level to guide local decision makers in integral watershed management in adopting a climate resilient approach. This often results in unsustainable land and water use in the watersheds. In a context of decreasing water availability due to climate change in the prioritized areas of the project, the lack of water and land-use management plans will exacerbate water scarcity problems and agricultural impacts.
75. **Local institutions lack strong governance mechanisms for climate change and natural resources due to limited technical and coordination constraints**. Local institutions have significant limitations in implementing public policies and adequately integrate gender equality or youth inclusion in relevant programmes for climate adaptation and watershed management. An important driver of this limitation in public policy implementation is a weak knowledge of internal communal norms, and accordingly limited locally adapted means to spur leadership and encourage active social roles of women and youth. At the same time, an additional weakness is the lack of community-driven and multi-stakeholder climate change adaptation processes, among others. In addition, institutions focus primarily on their sectoral priorities, often to the detriment of synergies with other sectors. As a result, opportunities for broader landscape level impacts are diminished or lost. The limited coordination across institutions, hinders the development and implementation of an effective approach that resolves institutional challenges, addresses direct and underlying causes of vulnerability, and empowers smallholders and other actors to sustainably manage their natural resources and agroecosystems to optimize productivity. It also affects hydrological and climate regulation and other ecosystem functions and services at watershed scale. Inter-institutional coordination is critical for the integrated landscape approach required for successful adoption of climate resilient agriculture and integral and participatory watershed management strategies at scale.

Table 8. Summary of barriers to adaptation and the project's approach to address them

	Adaptation barriers	**Project's approach to address the barrier**
Technical barriers	Smallholder farmers have limited technical support to apply the appropriate technological know-how and innovation to adapt traditional agroecosystems management to increased climate variability.	**The project will provide tailored technical advisory support and capacity building to help farmers and extension services identify and implement appropriate, gender-sensitive and climate-resilient restoration activities locally.** In order to address the capacity gap, technical advisory support will be provided under Output 1.1 and output 3.1 to support producers in the implementation, operationalization and maintenance of the selected climate resilient practices and technologies. Farmers will specifically be trained to learn about climate resilient agricultural techniques and understand the exposure to climate hazards that subsistence and monoculture agricultural systems pose in the face of climate impacts. The capacity building will be implemented in the following stages in the project: (i) design based on the local context, smallholders' needs, partners, and contributors; (ii) framing of the objective and scope according to smallholders' needs and strategies for scaling up the capacities and knowledge; (iii) development of local capacities for FFS; (iv) definition of the capacity building content; and (v) monitoring, evaluation, and continuous learning. All of this will be done in a participatory manner and over the course of at least two years to secure an adequate level of continuity. Participants will be smallholders (both men and women of various ages), with the assistance of the project's technical team, technicians from sub-national public institutions, NGOs, academia, and others supporting stakeholders.[105] This will allow for rapid dissemination of the adaptation to and adoption of climate-resilient agriculture technologies and practices and management, and it will contribute to the decentralization of extension services. The PROINPA Foundation's experience with the conservation, reproduction, and agroecological management of native potato and horticultural crop varieties in Bolivia's valleys and highlands is an important example of the benefits and possibilities provided by FFS.[106] Additionally,

[105] FAO (2016). Farmer field school. Guidance document. Planning for quality programmes. Rome: FAO.

[106] Vallejos J.; Gandarillas E. (2003). Análisis de impacto de las escuelas de campo en el cultivo de locoto (*Capsicum pubescens*). Estudio de caso de las Escuelas de Miguelito y Chulumani en el Municipio de Colomi. Cochabamba: PROINPA.

		capacity-building sessions for farm producers will be conducted under Output 4.3 to enhance their knowledge on climate risks, climate information and how to plan for adaptation. The project ensures that all activities will consider the collection of local traditional knowledge and integrate that with science-derived information to provide culturally relevant adaptation solutions and information for the local context. Grounded processes, such as the FFS and the coordination and consultative territorial and agro climatic platforms, will enable the practical integration of these two types of knowledge. Agroecological management (from planning to capacity building and implementation) will also promote the dialogue between traditional and scientific-technical knowledge, with the former serving as a critical foundation for agroecological management.[107] The capacity and technical advisory services integrate gender sensitivity as part of the project's transformative approach by adopting participatory strategies to ensure equitable and active participation of women and their improved access to knowledge and technology. This will enhance their economic situation via the use of climate-resilient technologies in agriculture, participation in the market opportunities to be fostered, and spaces of participatory governance. This approach is transformative for facilitating women's empowerment towards gender equality.
	Smallholder farmers lack appropriate and efficient on-farm water management practices and infrastructure to adapt to climate change.	**Technical training of farmers in sustainable water management practices and the climate-proofing of irrigation systems will enhance the efficient use of water and thus increase yield production during drought periods.** Project interventions under Output 2.1 on revitalizing irrigation systems and making them resilient to climate change by implementing modern systems will ensure efficient water use. On average, 90% of the irrigation systems in the Bolivian Valles Macro-region is based on gravity-fed irrigation or flood irrigation, which entails excessive water use. The climate proofing will be based on the results of the hydrological modelling, which identifies regions with water deficit and regions where the supply equals or exceeds the demand. For those regions where there is no water deficit, the technification will enhance the efficient use of water, such as implementing technologies such as drip and sprinkler irrigation. For those regions where there is already a high deficit of water, the project proposes the following interventions: (a) changing the planting time to ensure that sowing starts in the rainy season and therefore there is no need for irrigation during the sowing season; (b) changing the existing crops to crops with lower water requirements; (c) ensuring irrigation is based on rainwater harvesting, which can be used in the dry months; Low yields and poor (direct) access to local markets have made it difficult if not impossible for smallholders to generate sufficient income or access affordable credit to invest in technological innovations for climate proofing their irrigation systems. To address this limitation, the project will use two complementary approaches. The first approach is supporting and implementing income-generating activities (e.g., organization of fairs, facilitating access to markets, and setting up community and associative productive enterprises, as described in Output 1.2). A total of 4,448 ha of agricultural land will be more resilient to rainfall variability and other climate events as a result of climate-proofing irrigation systems. This will result in increased and more stable harvests for local markets, e.g., in the local communities, closest municipalities, and, when feasible, large cities within the project area. The second approach is contributing to and promoting the creation of financial mechanisms adapted to and accessible for smallholder farmers in Output 4.3. Additionally, the project activities under Output 2.2 will train smallholder farmers via FFS on adequate water use and management and invest in their implementation on the farms, which includes aspects of crop management for enhancing soil moisture retention.

[107] Altieri, M. A. (2021). La agricultura tradicional como legado agroecológico para la humanidad. *Revista PH*, *104*, 180–197.

Institutional barriers	Interinstitutional coordination takes place at regional level, without addressing the needs of smallholder farmers and producer associations.	**The project adopts a multi-level approach to empower both local and national institutions to effectively integrate climate adaptation interventions across agricultural systems and integral watershed management.** Project interventions include training and increased investment in concrete adaptation actions as a result of improved access to financial resources at local and national scale under Output 4.3. Project activities will strengthen producers and local governance structures on matters related to participatory climate adaptation and early warning systems. Under Output 4.1, training and workshops targeting local stakeholders (including smallholders, public officers, local CSOs, relevant academia, and the private sector) are planned to increase their knowledge base on climate resilient agriculture, climate-proofed irrigation, and watershed management for climate adaptation and resilience. These entities include municipality authorities and staff, as well as selected staff from provincial and departmental administrations, who will participate on multi-stakeholder platforms for watershed management. The project will build the capacities of public services staff (central and sub-national government technical and extension officers) to help them understand climate change dynamics regionally, nationally and sub-nationally and, in particular, the effects on the hydrological cycle and temperature. The sub-national governments are the project's co-implementing entities and will participate in its steering committee, where all project decisions will be taken. Investments in data generation and management (analysis and modelling) will contribute to strengthening local and participatory planning, decision making and early warning systems for agricultural risks; therefore, it will be useful for risk information-based governance. The agencies that will generate such data are the National Meteorological and Hydrological Service (SENAMHI) of the Ministry of Environment and Water and the Rural Contingency Unit - Early Warning System for Agricultural Risks, of the Ministry of Rural Development and Land, who will also participate in the training programme under Output 4.3.
	Local institutions lack strong governance mechanisms for climate change and natural resources due to limited technical capacities	
	Lack of systematic and solid monitoring and evaluation processes and data	The project has envisioned an integrated monitoring and evaluation process to document evidence and learning to improve processes for climate data generation, long-term monitoring systems, and methodologies (Output 3.2 and 4.3)
	Lack of integral and participatory micro-watershed management plans to guide climate-resilient ecosystem restoration and conservation practices.	**The project will promote highly participatory processes to strengthen micro-watershed governance.** Project interventions under Output 3.1 and 3.2 will support watershed communities to develop governance mechanisms for water management by strengthening the local participatory planning processes. These interventions will establish multi-stakeholder dialogues. Activities under Output 3.1 will implement and develop integral and sustainable water source management practices to ensure availability in permissible quantity and quality. To this end, both the inventory of water sources in municipalities and water balances in water basins in the target area will provide valuable information for the generation and strengthening of climate-responsive planning processes at local level, focused on conservation, access and use of water resources. Additionally, under this output, the project will support the development of common water use plans that will allow local producers to engage in responsible water use from source to consumption. This will strengthen diversified agricultural production systems and thus support the resilience of agroecosystems. For the implementation of the water use plans, affected rural landowners, both men and women, will receive technical assistance regarding water use in productive systems. **The project will build capacities on integral and participatory watershed planning and management to foster conservation and restoration of ecosystem functions and services, primarily the hydrological cycle.** Under Component 3, the project will restore 17,510 ha, of land, which is linked to the restoration of other ecosystems through soil restoration and conservation. This, together with the sustainable watershed management, will enhance and gradually secure the water cycle and groundwater replenishment. This approach will make a crucial contribution to securing water sources for implementing climate resilient agriculture (Component 1) and climate proofing irrigation (Component 2). It will also contribute to the implementation of the JMAM, since the ecosystem-based approach for restoration of ecosystem functions is in line with the national regulation adaptation to climate change, and the Management Plan for Watershed Resources and Integrated Watershed Management.

Financial barriers	Limited access of smallholder farmers to financing to build resilience.	**The project will strengthen the capacity of farmer organizations and develop tools and guidelines to facilitate farmers to overcome financial constraints.** Output 4.2 aims to collaborate with existing domestic funders and financial institutions to develop innovative financial instruments that enable the implementation of climate-proofed irrigation and ecosystems restoration investments. The project will further strengthen the capacities of communities, smallholders and associations on financial management and access to innovative financial instruments relevant for climate resilient agriculture. Project interventions in Components 1 and 2 will reduce the risk of borrowing from the perspective of the farmer by providing increased certainty about yields and cash flows. At the same time, the project will reduce the non-systemic, climate-related risk that makes agricultural lending less attractive to lenders than lending in other sectors.
	Smallholder farmers lack support for marketing and selling opportunities for their agricultural produce.	**The project will catalyze financing and foster inclusive markets.** Project interventions under Output 1.2 will aim to establish market fairs and mobilize public resources for investment in climate-resilient interventions. To address this barrier, the project interventions under Output 1.2 aim to conduct training to improve producers' access to markets for climate-resilient products. Smallholder organizations will receive training in business development to ensure adequate planning and management of production and marketing operations, as well as potential value-addition activities. As part of business development, farmers will learn how to apply for and manage production credit, including accounting, repayment schedules, and other aspects. This will enhance the adaptive capacity of the smallholder producers by generating additional and sustained income, which will be invested in the adoption and implementation of climate resilient agroecological management. **The project will provide technical assistance and guiding tools to key financial institutions to facilitate the creation of suitable financial products and services that respond to the needs of smallholder farmers.** Project interventions under Output 4.3 will (1) develop a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds and scale up and increase the number of beneficiaries and (2) provide specialized Technical Assistance to INSA to develop and implement innovative insurance mechanisms and to analyze the possibility to expand this activity to other private financial institutions.

Theory of change

76. The RECEM - Valles project aims to support the implementation of the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth by reducing the vulnerability of smallholder farmers by applying resilient agricultural practices (such as hail nets, solar tents) to increase farmer´s resilience to climatic events (Outcomes 1, 2 and 3) through the enhancement of critical ecosystem functions and services that sustain farmers' agricultural systems, the strengthening governance and institutional capacities at local level to support climate risk management (Outcome 4) and catalysing finance for by enabling improved access of smallholder farmers to a combination of financing mechanisms such as risk-informed insurance (Outcome 4).
77. The Theory of Change (ToC) is based on the close relationship between ecosystem functions and services (primarily hydrological regulation) and social-ecological resilience. It shows how degraded and climate-sensitive landscapes will be transformed by adaptive land use management practices and technologies to build resilience in the ecosystems that sustain agroecological systems and livelihoods. Figure 9 shows the ToC. Investment and financing opportunities, coupled with improved watershed planning and management, will set the scene for enhancing the resilience of the landscape. **Project's goal statement: IF vulnerable smallholder farmers in the Valles Macro-region of Bolivia implement improved climate-adapted agricultural and water management practices, THEN it will contribute to the implementation of the Joint Mechanism for Adaptation and Mitigation (JMAM) as a transformative initiative in Bolivia BECAUSE climate resilience of smallholder farmers can be increased by transformed land management practices, enhanced climate resilient ecosystems and strengthened governance capacity.**The project is designed to achieve four outcomes, which are jointly reinforcing to deliver a paradigm shift:

- Outcome 1. Strengthened food and income security in changing climate through climate resilient agricultural systems
- Outcome 2. Smallholder water resources secured to reduce the risks from droughts and low rainfall
- Outcome 3. Restored and conserved micro-watersheds and ecosystem functions and services
- Outcome 4. Enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms

78. To achieve Outcome 1, **if** the project (i) promotes resilient and transformative and adaptive agroecological management, (ii) encourages and supports the farmers to apply agricultural technologies (such as solar tents, hail nets) to reduce their vulnerability to extreme hazards and to enhance system function restoration relevant to climate-resilient agriculture and (iii)

enables farmers' access to markets, **then** smallholder farmers will increase the productivity of their agroecosystems, adopt agricultural technologies which will underpin their livelihoods, and thus have coping strategies to address climate shocks and increase their resilience. **Because** such measures will build resilience among vulnerable rural communities to future climatic shocks that would otherwise deepen their poverty while also enabling them to diversify household incomes and assets. They will improve their agricultural systems' performance in drought and restore erosion-degraded landscapes. Moreover, farmers will have a strengthened awareness of climate threats and risk-reduction processes and be equipped with the tools and knowledge to adapt to predicted climate change. Increased income can be used to invest in climate adaptation technologies and equipment periodically.

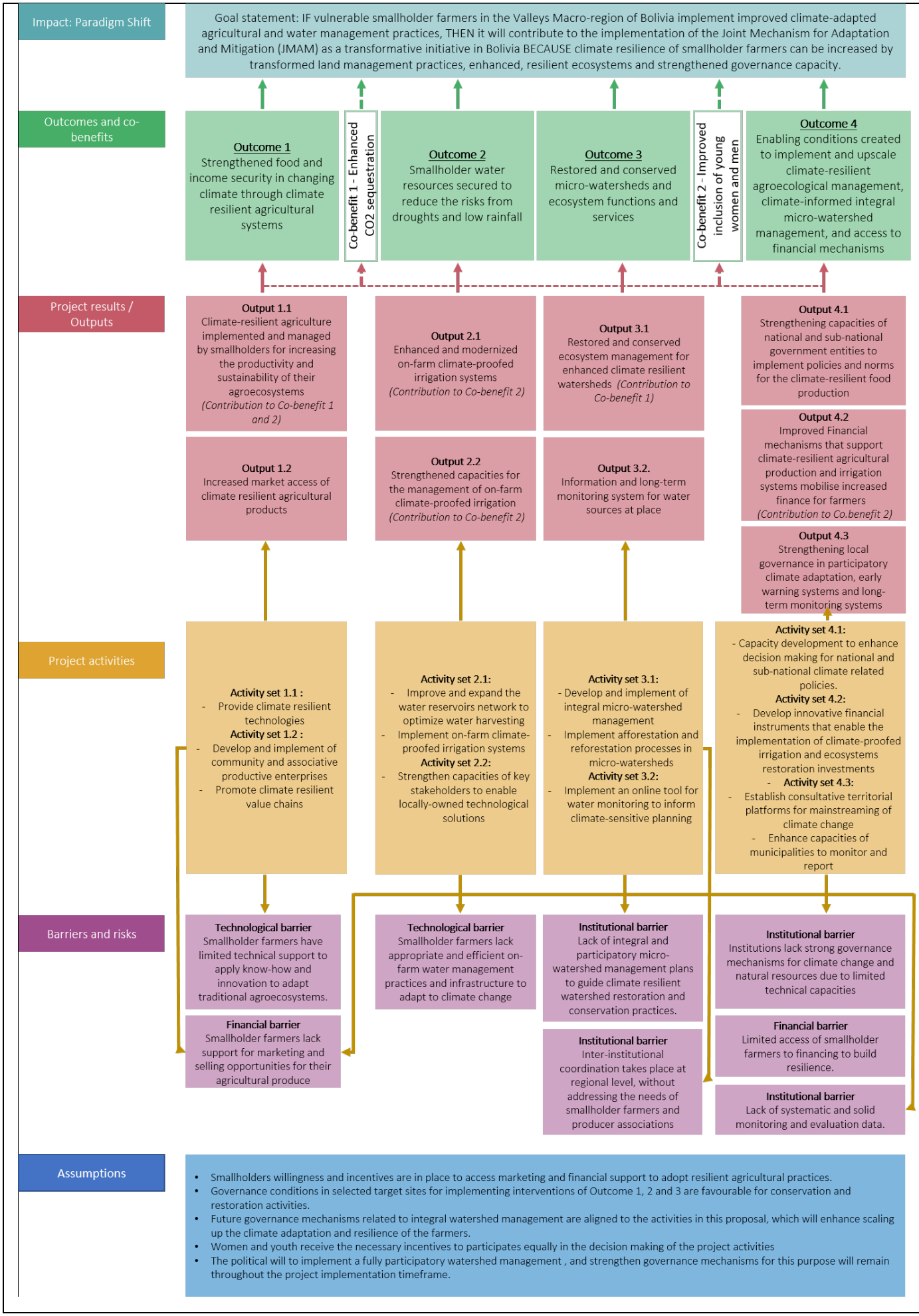
79. To achieve Outcome 2, **if** the project (i) enhances and climate proofs the existing agriculture irrigation system, (ii) promotes training to strengthen awareness and technical skills of farmers for sustainable water management, and (iii) establishes a credible monitoring system to measure agricultural irrigation water use, **then,** farmers will achieve water security and their resilience will thus increase amidst seasonal rainfall variability and drought events, **because** access to enhanced and climate-proofed irrigation systems for agricultural production would have increased alongside farmers' enhanced capacities for integral water resource management. Climate-proofed irrigation systems seek to minimize potential climate effects such as decreased water availability via an integrated approach of combining soil conservation practices, high efficiency irrigation technologies (including drip and sprinkle systems) and farm operation and management. This approach significantly decreases water productivity thus allowing reduced water extraction.
80. To achieve Outcome 3, if the project (i) fosters the adoption of sustainable micro-watershed planning and management, (ii) promotes restoration of watersheds, and (iii) introduces information and a monitoring system for water sources, **then** micro-watersheds and ecosystem functions and services will be reinforced and resilient, thus providing water resources needed for agricultural irrigation under climate change scenarios. **Because** restored and enhanced hydrological ecosystem functions and services combined with integrated and climate-informed planning and management practices will stabilize water supply for irrigation purposes in the micro-watersheds. By climate-proofing existing irrigation systems in tandem with integral micro-watershed management and ecosystem restoration, the project will optimize the capture, storage, management, and efficient use of water in gravity-fed drip and sprinkler irrigation systems. Smallholders and producers' organizations will learn to schedule applications efficiently, reduce losses, and manage drought and erosion risks.
81. To achieve Outcome 4, **if** the project (i) supports the implementation of the Comprehensive Management Plan for Watershed Resources and Integrated Watershed Management at sub-national level, (ii) facilitates multi-stakeholder and multi-level coordination and governance mechanisms, (iii) strengthens capacities of smallholder farmers on the governance of micro-watersheds and improved integral water management strategies, and (iv) facilitates non-reimbursable financing institutions (FONABOSQUE, and others) and financial institutions (BDP, FINRURAL) support production diversification, conservation of watersheds, and on-farm climate-proofing irrigation systems, among others. **Then,** enabling conditions are created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms to enhance smallholder farmers' resilience. **Because** improved institutional support for climate adaptation in watershed management will be in place and governance structures will be created at the micro-watershed level, this will enable long-term resilience planning and mainstreaming the project's approach at the national level. Additionally, access to affordable finance will allow smallholder farmers to re-invest in resilience-enhancing irrigation technologies and agroecological management. In this sense, irrigation can have an essential effect in stabilizing and increasing yields in the context of increasing climatic variability.

82. The project activities will result in two co-benefits (environmental, social, economic, gender, and mitigation):
    - Co-benefit 1. Enhanced CO2 sequestration, capture and storage potential due to avoided deforestation and increased soil carbon – will result from the implementation of activities under Output 1.1 focusing on the implementation of climate resilient agricultural practices which will enhance the organic soil content and thus contribute to improved CO2 sequestration and storage, while activities under Output 3.1 will contribute via restoration practices with vegetation and contributing to avoided deforestation, which will also contribute to increased potential for carbon sequestration and storage.
    - Co-benefit 2. Improved inclusion of young women and men in agricultural sector and reduced rural-urban migration – will be achieved by activities under Output 1.1, 2.1, 2.2 and 4.2. In particular, the project will create attractive opportunities for income generation for young women and men to be better engaged and minimize the need for rural-urban migration
83. **Assumptions and external factors:** The underlying assumption for the potential for paradigm shift is that effective adaptation in traditional agricultural systems will not expand rapidly in Bolivia in the absence of catalytic donor support. In particular:
    - Smallholders' willingness and incentives are in place to access marketing and financial support to adopt resilient agricultural practices
    - Governance conditions in selected target sites for implementing interventions of Outcomes 1, 2 and 3 are favourable for conservation and restoration activities
    - Future governance mechanisms related to integral watershed management are aligned to the activities in this proposal, which will enhance scaling up of the climate adaptation and resilience of the farmers

- Women and youth receive the necessary incentives to participate equally in the decision making of the project activities
- The political will to implement a fully participatory watershed management, and strengthen governance mechanisms for this purpose will remain throughout the project implementation timeframe.

84. The project adopts an integrated approach to build climate resilience in the water and agriculture sectors generating benefits to the most vulnerable population. By combining risk-informed adaptive water resource management at farm and watershed scale guided by solid national and local institutional structures with catalyzing financing opportunities to ensure sustainability at local level, the project demonstrates a solid strategy for resilient agricultural systems and local livelihoods. The project contributes to the GCF Fund-level impacts (A1.0) Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions; (A2.0) Increased resilience of health and well-being, and food and water security; and (A4.0) Improved resilience of ecosystems and ecosystem services. The project achieves its paradigm shift objective through transforming land management practices and enhancing climate resilient ecosystems and community capacity to adapt to climate change.

Figure 9. Theory of change of RECEM – Valles project


Impact: Paradigm Shift
Goal statement: IF vulnerable smallholder farmers in the Valleys Macro-region of Bolivia implement improved climate-adapted agricultural and water management practices, THEN it will contribute to the implementation of the Joint Mechanism for Adaptation and Mitigation (JMAM) as a transformative initiative in Bolivia BECAUSE climate resilience of smallholder farmers can be increased by transformed land management practices, enhanced, resilient ecosystems and strengthened governance capacity.
Outcomes and co-benefits
Outcome 1
Strengthened food and income security in changing climate through climate resilient agricultural systems
Co-benefit 1 - Enhanced CO2 sequestration
Outcome 2
Smallholder water resources secured to reduce the risks from droughts and low rainfall
Outcome 3
Restored and conserved micro-watersheds and ecosystem functions and services
Co-benefit 2 - Improved inclusion of young women and men
Outcome 4
Enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms
Project results / Outputs
Output 1.1
Climate-resilient agriculture implemented and managed by smallholders for increasing the productivity and sustainability of their agroecosystems (Contribution to Co-benefit 1 and 2)
Output 1.2
Increased market access of climate resilient agricultural products
Output 2.1
Enhanced and modernized on-farm climate-proofed irrigation systems (Contribution to Co-benefit 2)
Output 2.2
Strengthened capacities for the management of on-farm climate-proofed irrigation (Contribution to Co-benefit 2)
Output 3.1
Restored and conserved ecosystem management for enhanced climate resilient watersheds (Contribution to Co-benefit 1)
Output 3.2.
Information and long-term monitoring system for water sources at place
Output 4.1
Strengthening capacities of national and sub-national government entities to implement policies and norms for the climate-resilient food production
Output 4.2
Improved Financial mechanisms that support climate-resilient agricultural production and irrigation systems mobilise increased finance for farmers (Contribution to Co.benefit 2)
Output 4.3
Strengthening local governance in participatory climate adaptation, early warning systems and long-term monitoring systems
Project activities
Activity set 1.1 :
- Provide climate resilient technologies
Activity set 1.2 :
- Develop and implement of community and associative productive enterprises
- Promote climate resilient value chains
Activity set 2.1:
- Improve and expand the water reservoirs network to optimize water harvesting
- Implement on-farm climate-proofed irrigation systems
Activity set 2.2:
- Strengthen capacities of key stakeholders to enable locally-owned technological solutions
Activity set 3.1:
- Develop and implement of integral micro-watershed management
- Implement afforestation and reforestation processes in micro-watersheds
Activity set 3.2:
- Implement an online tool for water monitoring to inform climate-sensitive planning
Activity set 4.1:
- Capacity development to enhance decision making for national and sub-national climate related policies.
Activity set 4.2:
- Develop innovative financial instruments that enable the implementation of climate-proofed irrigation and ecosystems restoration investments
Activity set 4.3:
- Establish consultative territorial platforms for mainstreaming of climate change
- Enhance capacities of municipalities to monitor and report
Barriers and risks
Technological barrier
Smallholder farmers have limited technical support to apply know-how and innovation to adapt traditional agroecosystems.
Financial barrier
Smallholder farmers lack support for marketing and selling opportunities for their agricultural produce
Technological barrier
Smallholder farmers lack appropriate and efficient on-farm water management practices and infrastructure to adapt to climate change
Institutional barrier
Lack of integral and participatory micro-watershed management plans to guide climate resilient watershed restoration and conservation practices.
Institutional barrier
Inter-institutional coordination takes place at regional level, without addressing the needs of smallholder farmers and producer associations
Institutional barrier
Institutions lack strong governance mechanisms for climate change and natural resources due to limited technical capacities
Financial barrier
Limited access of smallholder farmers to financing to build resilience.
Institutional barrier
Lack of systematic and solid monitoring and evaluation data.
Assumptions
• Smallholders willingness and incentives are in place to access marketing and financial support to adopt resilient agricultural practices.
• Governance conditions in selected target sites for implementing interventions of Outcome 1, 2 and 3 are favourable for conservation and restoration activities.
• Future governance mechanisms related to integral watershed management are aligned to the activities in this proposal, which will enhance scaling up the climate adaptation and resilience of the farmers.
• Women and youth receive the necessary incentives to participates equally in the decision making of the project activities
• The political will to implement a fully participatory watershed management , and strengthen governance mechanisms for this purpose will remain throughout the project implementation timeframe.

B.2 (b). Outcome mapping to GCF results areas and co-benefit categorization

Outcome number	GCF Mitigation Results Area (MRA 1-4)				GCF Adaptation Results Area (ARA 1-4)			
	MRA 1 Energy generation and access	**MRA 2** Low-emission transport	**MRA 3** Building, cities, industries, appliances	**MRA 4** Forestry and land use	**ARA 1** Most vulnerable people and communities	**ARA 2** Health, well-being, food and water security	**ARA 3** Infrastructure and built environment	**ARA 4** Ecosystems and ecosystem services
Outcome 1	☐	☐	☐	☐	X	X	☐	☐
Outcome 2	☐	☐	☐	☐	☐	X	☐	☐
Outcome 3	☐	☐	☐	☐	☐	X	☐	X
Outcome 4	☐	☐	☐	☐	X	X	☐	X

Co-benefit number	Co-benefit					
	Environmental	**Social**	**Economic**	**Gender**	**Adaptation**	**Mitigation**
Co-benefit 1	X	☐	☐	☐	☐	X
Co-benefit 2	☐	X	X	X	☐	☐

B.3. Project/programme description (max. 2500 words, approximately 5 pages)

Project objective

85. The project objective is to increase the resilience to climate change impacts of smallholder farmers in the Valles Macro-region of Bolivia. This will be achieved by implementing integral and participatory micro-watershed management that includes the improvement of small-scale farmers' capacities to manage their agroecosystems sustainably, on-farm climate-proofing irrigation systems, and strengthening the corresponding governance and institutional capacities at local level to support climate risk management by smallholder farmers and their communities. The project aims to enhance the resilience of livelihoods, ecosystems, infrastructure, and food security in the Valle Macro-region of Bolivia, to be better prepared for the increasing threat of climate change. The project structure and proposed activities reflect the close relationship between ecosystem functions and services (primarily hydrological regulation) on the one hand, and climate and social-ecological resilience on the other. The project also aims to tackle the climate vulnerability experienced in the Valles Macro-Region through an integral and systemic perspective. The project design includes 4 interrelated components that seek to achieve climate change resilient productive systems which are compatible with the conservation of ecosystems and environmental functions and services, and which the local population and authorities can manage themselves:

- Component 1. Strengthened food and income security in changing climate through climate resilient agricultural systems
- Component 2. Smallholder water resources secured to reduce the risks from droughts and low rainfall
- Component 3. Restored and conserved micro-watersheds and ecosystem functions and services
- Component 4. Enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms

86. Component 1 of the project focuses on climate resilient agriculture implemented and managed by farmers for increasing the productivity and resilience of their agroecosystems. The resilient agroecological management will enable farmers to adapt to the main climate risks the project seeks to overcome: the increase in average temperatures and decreasing trend in rainfall. These practices include a shift to producing crops with greater resilience to higher temperatures and drier conditions. This

component is also based on supporting farmers with the marketing of their products and diversification of their agriculture-based income streams

87. Component 2 complements Component 1, in promoting activities, which seek to increase the resilience of the farmers. Component 2 focuses on efficient water usage (reducing the water losses through inefficient irrigation systems). Activities promoted under Component 2 include (but are not limited to), harvesting rainwater and improving the household irrigation systems with drip irrigation. Activities under Component 2 will contribute to the modernization and revitalization of existing irrigation systems, increasing their resilience to climate variability and reducing the risks associated with droughts and periods of low rainfall. Systems promoted under Component 2 include the implementation of technological innovation irrigation water management systems such as rainwater harvesting systems, family and community irrigation and micro-irrigation systems, drip irrigation, construction of water harvesting reservoirs, among others. These climate resilient practices are consistent with the results of the hydrological modelling (see paragraph 41 onwards), which identifies the areas with water deficit. The irrigation practices under activity 2.1.3 are only intended for those regions where there exists no water deficit, and there is sufficient surface water that allows farmers to connect to the existing larger irrigation networks.
88. Component 3 seeks to ensure that the water resources can be restored and conserved, ensuring the availability not only for the water users within the project (especially linked to Component 2) but also for the ecosystem functions. Component 3 seeks to ensure the sustainable management of the water basins to better enable the irrigation demands as implemented in Component 2.
89. Component 4 aims at institutional strengthening and enhanced access to climate finance to sustain and strengthen the Components 1, 2 and 3.
90. This project will enhance the productive and social assets of smallholders and their organizations and communities so that they not only adapt to climate change impacts and vulnerability to rainfall variability and drought, but also build their financial management capacities to invest in sustained maintenance of investments and continued climate-risk management. For a detailed description of the project design and rationale see section 17 in Annex 2. Feasibility study. Moreover, the project will contribute to the implementation and provide empirical cases of the JMAM, and the Management Plan for Watershed Resources and Integrated Watershed Management.
91. A multi-criteria analysis was used to identify and prioritize the project intervention area among the different regions in the country. The criteria used for the prioritization of the Valles macro-region included:

    * High vulnerability to climate change: Areas highly vulnerable to drought, frost and hailstorms (Indicator: Level of vulnerability).
    * Contribution to the basic family food basket of the main cities: Areas where agriculture is a key livelihood activity (Indicator: Production of more than 60% of the basic family food basket).
    * Water recharge areas: Areas with high water recharge, where climate change is likely to impact the aquifer conditions (Indicator: >640 mm/year)
    * Priority areas for conservation of biodiversity: Conservation areas in good condition generate ecosystem services in particular hydrological ecosystem services (Indicator: Level of biodiversity).

92. All project activities – including technical topics, capacity-building methodologies, and field trials of adaptive technologies - will be monitored and the results evaluated to identify new areas of knowledge, lessons learned, and best practice/best tech. Project field staff will capture this information and feed it to the project's knowledge management specialists who will analyze, systematize, codify and package it for dissemination to producers, local governments, NGOs, and others throughout the Valles Macro-region. The Knowledge Management team will also produce relevant potential policy inputs for submission to local, provincial, and national authorities regarding resilience enhancing agricultural systems, watershed restoration and management, and landscape governance. The knowledge management program of this project will be developed in detail during the first year of the project implementation.
93. **The direct beneficiaries of the proposed project are vulnerable smallholders** (defined as small-scale family farmers relying on family labor, and therefore with limited access to the human, physical and financial resources required for adaptation), and who are at greatest risk of being pushed into conditions of extreme food insecurity due to climate change (all of those in conditions of poverty or extreme poverty fall into this group). The project has been designed to address the needs of the most climate-vulnerable farmers in Bolivia's Valles Macroregion.
94. The project will target the same smallholder farmers with approximately 0.5 ha of land, who principally produce maize, vegetables, potatoes, wheat. Interventions will also be of direct benefit to central and sub-national government representatives and extension officers through the capacity building activities, and to the key actors across the region's agriculture value chains. For detailed information on the selection, methodology and criteria for the beneficiaries see section 15 of Annex 2, Feasibility study. The selection criteria for small-holder farmers include:

    - Residence within the project Municipalities.

- Small-scale family farmers[108] .
- Those whose primary source of income depends on agriculture.
- One or more members of the family are malnourished.
- Vulnerability due to exposure to environmental and climate change risk.
- Household with 6 or more members.
- Agrarian property titled by INRA.
- Manifest willingness to implement project management practices.

95. Based on lessons learned from past projects, beneficiaries will be requested to make a contribution in-kind (like labour). Notably, there is increased likelihood of project success when there is a contribution in-kind (such as labor or other resources) from the beneficiaries. In addition, experience shows that households that make a contribution in-kind (like labour) are more likely to engage sustainably in project activities. The baseline analysis for the project shows this represents no barrier for the participation of the most vulnerable farmers; in fact, past experiences prove this effective for sustainability of activities post project (see FS, page 148).
96. It is important to note also that the project proposes differentiated strategies for both small, poorer and more vulnerable farmers who are already part of associations, and those who are not but can become members, thus fostering inclusion through associativity. The support and technical assistance to both groups has clear and differentiated activities to achieve climate resilience benefits at both the farm, community and agro-ecosystem level. Strengthening producers' associations and helping vulnerable farmers join them will help improve market access, facilitate certifications of designation of origin and directly strengthen agri-food systems carried out by small farmers at the individual or family plot level.
97. The project considers a logic approach linking farmers with financial services, through their own capacities. According to this approach, most vulnerable people, chronic poor and extremely poor, should be subjects of safety net programs more than micro credits or microfinance. The process promoted by RECEM VALLES is to de-risk the transitory vulnerable farmer's activities and financial transactions, through many of the activities of the project aligned to make eligible the small farmers and the most vulnerable as a client for the proposed financial products.

Component 1. Strengthened food and income security in changing climate through climate resilient agricultural systems

98. Component 1 aims at developing resilient production systems through the implementation of climate-resilient agricultural technologies (including thermal blankets, anti-hail nets, hydrogels, etc.); climate-resilient agroecological management and management systems (including conservation agriculture, agroforestry systems) based on agroecological management as a strategy for the conservation and recovery of degraded soil (which also provides mitigation co-benefits such as carbon capture and sequestration); efficient water use; and the achievement of more productive and sustainable agroecosystems, transforming and reorienting agricultural systems to effectively support sustainable development and ensure food security in a changing climate. According to this viewpoint, agroecological management - which is characterized by biodiverse production systems and thus restoration of ecosystem functions and resilience to extreme climate events[109] - contributes to the implementation of on-farm ecosystem-based approaches to climate resilience. This is consistent with the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth, and the Economic and Social Development Plan (PDES) that, among others, favors initiatives with positive effects on biodiversity, food security, sustainable use of water resources, adaptation to climate change and enhancement of forest carbon stocks carbon sequestration (as co-benefit), in addition to reducing deforestation and soil degradation. From this perspective, agroecological management contributes to linking adaptation and mitigation with forest conservation and creating complementary actions between agriculture, and forests.[110]
99. Additionally, local capacity will be developed among rural producers, to ensure sustainability beyond the scope of the project. This will be achieved by providing support to smallholders on market access, correct operation and timely maintenance, and identification of opportunities for productive diversification. Both are adaptation strategies in themselves and offer alternative sources of income, which could ensure the long-term sustainability of the project investments.

[108] During the International Year of Family Farming, small-scale family farmers: was defined as a form of organizing agriculture, livestock, forestry, fisheries, aquaculture, and pastoralism that is managed and operated by family members; relies predominantly on family labour, both women and men; and the family and the farm are linked, co-evolving, and combine economic, environmental, social, and cultural functions. Moreover, it provides the majority of the family income and food consumed. In Bolivia, small-scale family farming was defined by the Agricultural Development Sector Plan 2014–2018 "Towards 2025" of the Ministry of Rural Development and Lands (MDRyT) as "Sustainable Family Farming," described as "production characterized by the relationship between family labour and available productive resources as a strategy that diversifies production in harmony with Mother Earth, in order to guarantee food sovereignty for future generations." According to the descriptions provided by the Law No. 3545, the following fall into the family farming definition: (i) community lands of origin or Indigenous peasant territory; (ii) community properties; (iii) peasant plots; and (iv) smallholdings.
[109] Holt-Giménez, E. (2002). Measuring farmers' agroecological resistance after Hurricane Mitch in Nicaragua: a case study in participatory, sustainable land management impact monitoring. Agriculture, Ecosystems & Environment, 93(1–3), 87–105.
[110] Ministry of Foreign Affairs of the Plurinational State of Bolivia (2013). https://www.cancilleria.gob.bo/webmre/node/1703

Output 1.1. Climate resilient agriculture implemented and managed by smallholders for increasing the productivity and sustainability of their agroecosystems (GCF: 11.31M)

100. Activities under this output will implement resilient agricultural management, based on the deployment of climate-resilient technologies to address vulnerability to climate change and support the implementation of climate-resilient agroecological management and management systems such as hail nets, thermal blankets, solar tents and the application of hydrogel. The selection of the proposed practices and technologies is based on best practices and feasibility analysis of their technical performance for achieving agricultural resilience.[111] See Table 6 (Section B1) for the links between the proposed technologies and the climate hazards and impacts they will address.
101. Activity 1.1.1. Agricultural technologies and practices in the context of Output 1.1. will be implemented in municipalities with a high and very high vulnerability to climate change, specifically with a high and very high risk of frost, with an increased risk of hail and/or with a very high and high risk of drought. The project will implement resilient agricultural technologies (such as solar tents and frost blankets) in municipalities with a greater horticultural vocation and a high and very high risk of frost to increase vegetable crops' productivity and yields. In municipalities with an increased risk of hail and/or with a very high and high risk of drought, resilient agricultural technologies and practices (such as anti-hail netting and hydrogels) will be implemented to increase yields and productivity and reduce climate-related losses of vine and fruit crops. The municipalities with the most significant agricultural production area and high use of pesticides will receive the organic agricultural inputs that are best suited to their agronomic and environmental needs.
102. Activity 1.1.2:Capacity building will be conducted for producers in the following areas: the proper use of the technologies and practices implemented in activity 1.1.1, as well as agroecological production (crop, livestock, agroforestry); the proper use and provision of organic inputs (fertilizers and biological products for pest control) appropriate to agronomic and environmental needs; on-farm preparation and use of biological inputs for ecological fertilization and pest management, in addition to generating greater awareness on the effects using of agrochemicals.
103. Slash-and-burn will be addressed under activities 1.1.1 and 1.2.1 through awareness-raising workshops and trainings in fire-free production practices. Moreover, climate-resilient agriculture practices will reduce the burning and illegal logging of forests, as these agricultural practices will have to move towards more technified practices.

This output will be achieved via the following activities:

Activity	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 1.1.1: Provision of climate technologies and implementation of climate resilient agricultural practices to address vulnerability and increase resilience in the Valles Macro-region (GCF).	Provide technical assistance for the adoption of the integral packages of climate technologies for agricultural adaptation, which will include: solar tents, anti-hail nets, thermal blankets and hydrogel	4,680	2,434	2,246
Activity 1.1.2: Capacity building on climate resilient agricultural practices to contribute to increased resilience and productivity of agricultural systems (GCF).	This activity includes the capacity building of the farmers related to the use of the technologies provided under activity 1.1.1. In addition, the capacity building will also include: agroecological production and agroforestry practices, such as: crop rotation, crop diversification, proper use and provision of organic inputs (fertilizers and biological products for pest control) appropriate to agronomic and environmental needs, on-farm preparation and use of biological inputs for ecological fertilization and pest management, in addition to generating greater awareness on the effects using of agrochemicals. This activity complements activity 3.1.2 where agroforestry and agroecological management practices will be implemented on farm level.	23,551	12,247	11,304

Selection criteria for implementation of Activity 1.1.1

[111] Centro de Investigación y Promoción del Campesinado (CIPCA). 2018. Impacto de los sistemas de riego y microriego en tres regiones de Bolivia. Estudios de Caso en Valles interandinos, Altiplano y Chaco boliviano

ACTIVITY 1.1.1	
Indicator	**Criteria**
1,200 family and communal solar tents have been implemented	i) Farmers living in areas with very high and high risk of frost (including extreme events) ii) Family farmers producing vegetables iii) Farmers who can provide an in-kind contribution (like labor).
600 anti-hail nets have been installed	i) Farmers living in areas with very high and high risk of hail (including extreme events) ii) Family farmers producing vegetables and others. iii) Farmers who can provide an in-kind contribution (like labor).
1,000 frost blankets implemented	i) Farmers living in areas with very high and high risk of frost (including extreme events) ii) Farmers producing grapes and fruit iii) Farmers who can provide an in-kind contribution (like labor).
5,200 small-scale producers (30% women and 10% youth) have incorporated hydrogel	i) Farmers living in areas with very high and high risk of drought (including extreme events) ii) Family farmers with agroforestry systems iii) Farmers who can provide an in-kind contribution (like labor).
ACTIVITY 1.1.2	
At least 23,551 producers (40% women) that have been trained in agroecological production, conservation agriculture and/or agroforestry. As a result of this activity, farmers can individually provide maintenance of the equipment.	As above: Activity 1.1.2 complements Activity 1.1.1

Output 1.2. Increased market access of climate resilient agricultural products (GCF: 4.3M)

104. The project proposes an approach to food production that can improve productivity, increase resilience to climate change through different options for climate resilient management of agricultural systems (including agroecological soil and crop management, and the integration of climate-proofing technologies such artisanal solar tents, thermal blankets, anti-hail nets, among others). This output focuses on developing the capacity of small rural producers, and strengthening community and associative productive enterprises by facilitating access to markets. Furthermore, identifying opportunities for productive diversification enables alternative sources of income generation and ensures the long-term sustainability of the project investments.
105. Lastly, under Output 1.2 the project promotes economic diversification by fostering the agricultural and marketing conditions to produce and sell, respectively, high-value products that have the potential to provide producers with new alternatives that complement their economic income. In this regard, beekeeping, among others, is defined as the targeted value chain that can complement smallholder's income, to support the investment in climate technologies under this Component and the climate proofing of irrigation systems in other Components of the project. Income diversification activities will serve as enabler for the sustainability of adaptation measures implemented under the project. The Collection and Marketing Centers have the following purposes :i) establishing a community space where small producers and producers from peasant and indigenous communities can sell their products directly "from the producer to the consumer" at a fair price. ii) must meet the minimum conditions to be able to provide a freezing and refrigeration service, in order to maintain and prolong the shelf life of perishable products, which are often marketed for lack of this space at prices that do not allow the generation of surpluses and reinvestment for the new production cycle. Through an activity directly with the community productive enterprises are groups of associated natural persons who, within the framework of the legal personality of the community or a specific legal personality. The GISBA Program (Gestion Central y Sostenible del Bosque, or the Central and sustainable management center for the forest) has developed a guide for the Incubation of Community Productive Ventures with the purpose of providing a series of tools to facilitate the process of building the Community Social Economy Venture plan with the active participation of the stakeholders. Under this methodology, the RECEM Valles Project plans to strengthen the capacity of producers through the implementation or strengthening of community-based productive enterprises that contribute to food security and poverty reduction. This output will be achieved via the following activities:

Activities	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 1.2.1: Development and implementation of community and associative productive enterprises (GCF).	This activity will place emphasis on facilitating and providing technical assistance to the small holder farmers on the processes of organic certification for agricultural products as well as on strengthening agricultural food supply chains by facilitating market access for agricultural products.	4,000	2,080	1,920

Activity 1.2.2: Technical support and implementation of collection and marketing centers for agroecological products (GCF)	Strengthen community-based and associative productive ventures related to resilient agroecological management within the framework of the consolidation or implementation of centers for the collection, processing and marketing of agroecological products.	4,000	2,080	1,920
Activity 1.2.3: Promoting climate resilient value chain for livelihood diversification according to the prioritized region (GCF)	Economic diversification is promoted in the context of increasing resilience to climate change. In this regard, the alternative value chain of beekeeping is proposed.	947	492	455

ACTIVITY 1.2.1	
Indicator	**Criteria**
At least 120 producer associations (at least 40 led by women) have received training and technical assistance for the organic certification process	i) Associations of small producers with at least 4 years of active existence at the start of the project with willingness and/or experience in organic certification processes for their products and whose members will benefit from the activities in this output 1.1
600 anti-hail nets have been installed	i) Farmers living in areas with very high and high risk of hail (including extreme events) ii) Family farmers producing vegetables and others. iii) Farmers who can provide an in-kind contribution (like labor).
ACTIVITY 1.2.2	
Four (4) collection and marketing centers built for agroecological products	i) Areas with high potential for the consolidation and/or development of local markets for family farmers. ii) Areas with high demand for products for basic food supply iii) Areas where local governments and/or producer associations show plans for technical and/or financial counterpart (PTDI, private investment, etc.)
ACTIVITY 1.2.3	
20 associations of honey producers, both men and women, at the local level and 3 regional associations	i) Associations of producers located in areas with very high and high vulnerability to extreme phenomena (frosts, hailstorms, droughts). ii) Associations of producers located in areas with a high incidence of degradation and/or desertification in adjacent areas.producers, who can provide an in-kind contribution (like labor).

Component 2. Smallholder water resources secured to reduce the risks from droughts and low rainfall

106. Component 2 aims to develop and implement resilient irrigation technologies and practices for efficient use of water and counteract the water deficit that are consequence of the effects of climate change. Component 2 has been designed with the various irrigation scenarios as indicated in the O&M plan. The activities within this component are aimed towards the revitalization and modernization of irrigation systems that are resilient to climate variability, to reduce the risks of droughts and low rainfall. It will also develop capacities and provide training for the management of climate-resilient irrigation systems.

Output 2.1. Enhanced and modernized on-farm climate-proofed irrigation systems (GCF: 5.2M, CO-FINANCING: 20.5M)

107. The activities designed under this output seek to build resilience keeping in mind the different hydrological balances between the regions.
108. Activity 2.1.1 seeks to implement technologies for those regions with moderate water deficit (10-20 percent of the water supply available). Climate proofing the irrigation systems in these regions consist of harvesting rainwater that will be used for those months where the demand is higher than the supply.
109. Activity 2.1.3 seeks to implement technologies for those regions: drip and sprinkler irrigation technologies will be promoted to enhance the water efficiency and to ensure irrigation is based on rainwater harvesting, which can be used in the dry months and 2) adaptation practices will be focused on: (a) changing the planting time to ensure that sowing starts in the rainy season and therefore there is no need for irrigation during the sowing season; (b) changing the existing crops to crops with lower water requirements. All these adaptation practices are focused on coping with drought.
110. Activity 2.1.2 seeks to update the inventory on the use of irrigation systems in the Macro region. The inventory will be used to further design the correct measures given the hydrological balance, under activity 2.1.3, supporting communities and municipalities to use the inventory to guide decisions on appropriate water distribution, as indicated in the O&M plan. The inventory is intended to provide more detailed inputs to the O&M Plan to be developed under activity 2.2.2, as well as to

provide inputs to output 3.1. (inventory of water resources and the development of climate change adaptation strategy). A draft O&M plan is included as Annex 21 to the Funding proposal.

111. This output will be achieved via the following activities:

Activities	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 2.1.1: Improve and expand water reservoirs network to optimize water-harvesting activities linked to on-farm climate-proofed irrigation systems (GCF and CO-FINANCING).	Strengthen and implement community and family water reservoirs with geomembrane and/or water tanks to optimize water-harvesting activities linked to resilient irrigation systems. GCF: RECEM Valles will strengthen and implement community and family water reservoirs with geomembrane and/or water tanks to optimize (rain) water harvesting activities linked to resilient irrigation systems that the project will implement at on-farm level. CO-FINANCING: the MMAyA will improve and strengthen small water reservoirs (Structures with less than half a million cubic meters of reservoir, with a length of less than one kilometer and a crown height of less than 10 meters are considered small), to optimize water storage and water availability. MMAyA will implement water systems only until the hydrant.	45,104	23,454	21,650
Activity 2.1.2: Update the inventory of irrigation systems, to enable the implementation and revitalization of climate-proofed on-farm irrigation systems (GCF).	Update and complement the water inventory to define irrigation interventions in selected sites to achieve the interventions' best efficiency and effectiveness	8,896	4,626	4,270
Activity 2.1.3: Implement, revitalize and technify on-farm climate-proofed irrigation systems (GCF).	Upgrade the irrigation system, to optimize water-harvesting activities in the face of prolonged drought periods. The municipalities in the project intervention area with a risk of continued drought are prioritized, but where there exists no water deficit in the available water resources.	4,000	2,080	1,920

112. Selection criteria for the implementation of Activity 2.1.1 and 2.1.3:

ACTIVITY 2.1.1	
Indicator	
1,000 community reservoirs in municipalities with a high and very high risk of drought.	For the selection of the community reservoirs: i) Communities in areas with very high risk of drought ii) Communities with existing Agricultural Productive Units For the selection of the family water tanks: iii) Family farmers with existing irrigation systems and living in areas with water deficit as demonstrated in the results of the hydrological balance, who can provide an in-kind contribution (like labor).
5,000 family water tanks have been implemented in municipalities with a high and very high risk of drought.	
ACTIVITY 2.1.2	
1 Inventory of irrigation systems prepared, published and distributed to sub-national authorities to contribute to PSDIs, PTDIs and other key actors as SENARI	The inventory of irrigation systems will be carried out throughout the whole project's area of influence
ACTIVITY 2.1.3	
● 4,448 farm hectares have been revitalized and/or equipped with technified and resilient irrigation systems.	i) Family farmers living in areas with water deficit as demonstrated in the results of the hydrological balance ii) Family farmers producing products for basic food supply iii) Farmers who can provide an in-kind contribution (like labor).

	iv) Areas with existing or near future irrigation investments from the government, to improve irrigation systems and food production.

Output 2.2. Strengthened capacities for the management of on-farm climate-proofed irrigation (GCF: 1.83M, CO-FINANCING: 1.2M)

113. The paradigm shifting approach of the project foresees that technification of traditional irrigation systems must go hand in hand with capacity building for the farmers in the management of climate-resilient irrigation systems and the distribution of water for irrigation (as indicated in the O&M plan, Annex 21). This will be achieved by training community promoters in Farm Field School (FFS) and training professional technicians at the technical training institutions and/or universities. Farm Field School will train farmers in the design and implementation of climate-resilient irrigation systems - including drip irrigation and water harvesting systems - to overcome prolonged periods of drought. This output includes the following activities:

Activities	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 2.2.1: Strengthen capacities of irrigation associations, farmers and community promoters) to enable locally owned technological innovation processes related to on-farm climate-proofed irrigation systems (GCF)	Conduct training and strengthening technical capacities in irrigation for community promoters, as an incentive for local producers to effectively adopt and manage climate-proofed irrigation systems.	8,896	4,626	4,270
Activity 2.2.2: Replicate technological innovation processes related to on-farm climate-proofed irrigation systems to up-scale the knowledge to other communities through the strengthening of capacities of key actors, technicians and professionals in national and subnational levels (CO-FINANCING).	Conduct specialized training to promote and strengthen technical capacities of key actors, technicians and professionals in national and subnational levels to replicate knowledge and ownership and scale-up climate-proofed irrigation systems. This activity will be solely implemented with co-financing support from MMAyA (Ministry of Environment and Water).	52,396	27,246	25,150
Activity 2.2.3: Design an O&M Plan for the irrigation systems (at municipality level) including arrangements between MiRiego, Municipalities and the Irrigation Committees (GCF)	The purpose is to ensure the irrigation committees are able to cover O&M costs once project is concluded. Therefore, in this activity the content of the plans and the legal document will be designed.	8,896	4,626	4,270
Activity 2.2.4: Promoting the signature of the legal agreements and the O&M Plans for the irrigation systems between MiRiego, Municipalities and the Irrigation Committees (CO-FINANCING)	The purpose for the signature of these agreements is to ensure the commitment for the O&M of the irrigation systems as installed under activity 2.1.1 and 2.1.3 as a requirement before the investment and to monitor the fulfillment of commitments.	8,896	4,626	4,270

ACTIVITY 2.2.1	
Indicator	**Criteria**
At least 5 farmer's field schools have trained 448 (30% women and 10% youth) community promoters for the implementation of climate-proofed irrigation systems.	The geographical location of the Farmer Field schools will be focused on the following areas: i) Areas with very high and high risk of drought; ii) Areas of family farmers with water deficit as demonstrated in the results of the hydrological balance iii) Areas of family farmers producing products for basic food supply
Through at least 3 strategic alliances between the technical education entities and universities in the project's intervention area, 120 technicians have been trained	These alliances will be built with entities who work in the Project area
120 technicians from the National school of irrigation and the universities have updated their knowledge on climate – proofed irrigation systems.	The technicians will be selected based on working in the project area, especially on those areas where interventions will take place in component 1 and 2
ACTIVITY 2.2.2	

5000 agricultural production units have been trained	This activity will be focused in areas outside of the intervention areas, as it relates to replicate technologies to other areas outside of the GCF funded interventions: i) Areas with very high and high risk of drought; ii) Areas of family farmers producing products for basic food supply
ACTIVITY 2.2.3	
7 O&M plans designed for the irrigation systems within the framework of the inter-institutional platforms of the water basins 1 standard legal agreement prepared and validated	i) Areas with existing or future irrigation investments from the government, to improve irrigation systems and food production.
ACTIVITY 2.2.4	
7 O&M plan signed in each micro region	i) Areas with existing or future irrigation investments from the government, to improve irrigation systems and food production.

Sustainability of irrigation O&M

114. The proposed GCF project is designed to build on lessons learned from past irrigation efforts, through a focus on interventions that are financially viable for farmers, and through establishing an operations and maintenance (O&M) programme that reflects best practice developed over the past several decades.
115. The financial analysis presented in Annex 3 shows that project interventions reduce farmers' climate change-related losses and result in increased financial returns for farmers over the medium to long term, compared to business-as-usual. The main financial barriers relate to farmers' risk aversion, access to capital, and knowledge and prevailing practice constraints. The project's benefits overcome these barriers, provide farmers a financial incentive to continue the resilience strengthening activities (including irrigation) and provide increased financial certainty to sustain these measures into the future. The farmers' improved and more predictable cashflows increase their willingness to access productive credit, while the project's emphasis on associative borrowing makes it easier for financial intermediaries to extend innovative lending and insurance products to support continued investment in irrigation systems.
116. Regarding other lessons related to O&M, a PROAGRO sustainability and self-management of irrigation study showed, that after three years, only 20% of the irrigation systems presented problems for continuity and sustainability... The factors contributing to active maintenance and upkeep are: (a) the organizational experience of traditional system operators; (b) the quality and safety of the water source; (c) the functionality of the irrigation infrastructure; and (d) the favorable effects on the agricultural economy due to the increase in water for crops.
117. The results of studies on irrigation projects in the 1990s (CIIR1, 1991), reported that the provision of Technical Assistance (TA) in the development and management of irrigation in the country was, in general, limited, partial or simply non-existent, because the projects had an exclusively technical approach focused on delivery of equipment, without taking into account the social nature and or cultural vision of irrigation. This flawed approach contributed to the deterioration in some irrigation systems. Those studies also observed that the successful technified irrigation projects are those with support managed by NGOs and/or foundations, which monitor the operation and maintenance in the medium term (5 years). These lessons contributed directly to the design of the current project proposal, which includes measures that ensure the sustainability of the irrigation systems, such as developing capacities and follow-up for at least 2 years to ensure continuity, providing support and capacity development of smallholders for the correct operation and timely maintenance of irrigation systems, and accompanying beneficiaries during and after the implementation of the project so they can take ownership of operation and maintenance. The O&M plan (Annex 21) provides further details on how these lessons have been incorporated into the design of the project.
118. The project includes clear measures to engage and strengthen the counterpart capacities of the beneficiaries and associations, so that there is an appropriation of the interventions, and they can consciously carry out maintenance. This includes training to ensure that water storage facilities are kept clear of organic matter, in order to avoid methane emissions from anaerobic decomposition.

Component 3: Restored and conserved micro-watersheds and ecosystem functions and services

119. Component 3 aims to improve the water security of communities and smallholder farmers, to ensure the sustainability of their climate-resilient livelihoods under the participatory approach of comprehensive management of watershed river basins. This Component will facilitate the development of integral micro-watershed management and water use plans to enhance climate change adaptation. This effort will be based on an inventory of water sources and the water balances of strategic basins and/or micro-basins, as a tool for informed, long-term, climate-sensitive planning processes. The proposed investments comprising this component, will include restoration processes in micro-watersheds, with a view to restore and conserve soils,

forests, wetlands and native grasslands with key functions to regulate hydrological and carbon storing function, to increase resilience and climate adaptation in the target area.

120. This component and its contribution to the restoration and conservation of micro-watershed ecosystem functions and services (together with Component 1 from its agroecological perspective), directly contribute to the implementation of the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth. Furthermore, the suggested approach focused on participatory processes (together with Component 4), and contributes to different indicators of the JMACC, as indicated under this component. This highlights the interconnectivity and mutually supporting components of RECEM Valles.

Output 3.1. Restored and conserved ecosystem management for enhanced climate resilient watersheds (GCF: 3.85M, CO-FINANCING: 6.6M)

121. Activities under this output will implement and develop integral and sustainable agroecological management and soil management practices to ensure the availability of water of sufficient quantity and quality. To this end, both the inventory of water sources in municipalities and water balances in water basins in the target area will provide valuable information for the generation and strengthening of climate-responsive planning processes at local level, focused on conservation, access and use of water resources. Additionally, project interventions include restoration activities across 17,510 hectares. These areas are located in the headwaters of the micro-basins and in the areas of the drainage systems. The selection of these hectares was made through the analysis of the existing thematic cartography, prioritizing the areas of greatest degradation and their potential for water recharge. Critical criteria also is that these areas selected for agroforestry practices should be located in regions without water deficit. A detailed list of the selected tree species and their uses can be found in Table 39 of Feasibility Study Annex 2. This output will be achieved via the following activities:

Activities	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 3.1.1: Development and implementation of integral micro-watershed management and water use plans to enhance climate change adaptation (GCF).	Develop common water use plans, which will allow local producers to make responsible water use from source to consumption. This will benefit the strengthening of diversified agricultural production systems and thus will support the resilience of agroecosystems. For the implementation of the water use plans, affected rural landowners, both men and women, will receive technical assistance regarding water use in productive systems. The water use plans to be implemented will require the endorsement of the local government or municipality.	46,531	24,196	22,335
Activity 3.1.2: Implement restoration processes in micro-watersheds, to increase resilience and climate adaptation by enhancing ecosystem functions and services (GCF and CO-FINANCING).	Perform restoration practices for the conservation and restoration of watersheds and their environmental functions. Restoration measures as an intervention to recover water sources and degraded soils. The intervention will consist of the restoration with native species, according to each selected site's ecological and environmental characteristics.	58,000	30,160	27,840

ACTIVITY 3.1.1	
Indicator	**Criteria**
An updated inventory of water sources for the municipalities prioritized by the project in the Valles Macro-region. 14 water use plans implemented (local water development plans and local micro-basin management plans)	The updated inventory will be carried out for all the 65 selected municipalities. Criteria for the implementation of water use plans: i) Areas with Basin Master Plans in design and/or existing plans that have been approved for implementation ii) Areas with very high and high risk of drought and where project interventions have been implemented in component 2 and 3
ACTIVITY 3.1.2	
17,510 ha under agroecological and/or agroforestry management in public areas and family farmers Monitoring report for the restoration activities and conservation water sources and valley ecosystems.	i) Areas that are located in water recharge areas and/or existence of water sources with priority for those with a local plan such as water use plans and PTDIs Farmers, who can provide an in-kind contribution (like labor).ii) Presence of family farmers producing products for basic food supply iii) Areas with high risk of land degradation

Output 3.2. Information and long-term monitoring system for water sources at place (GCF: 0.51M)

122. Activities under this output will aim at developing an Information and Monitoring Tool for Water Sources, allowing the Project and national and local authorities to monitor the state of conservation of these sites, and to make timely adjustments to the management, protection, conservation and/or restoration actions that are scheduled to be carried out under output 1.1 and 3.1. The Monitoring tool will also allow the generation of up-to-date information about the quantity and quality of available water resources over time. This will determine the effectiveness and sustainability of proposed adaptation actions under the irrigation components of the project and the overall resilience of agricultural production systems in the target area. Similarly, the Monitoring Tool will be complemented by the calculation of the climate footprint (assessing both water and energy use) of traditional and climate-proofed irrigation systems in conventional and agroecological production systems. The calculation of the climate footprint will be used to further define the O&M plans, to be developed under activity 2.2.2 and which will guide the municipalities to make informed decisions on which irrigation systems are best suited under the current and future climatic conditions.

Activities	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 3.2.1: Develop and implement an online tool[112] for monitoring, consolidation and dissemination of information relevant for informed climate-sensitive planning and decision-making processes related to sustainable water use ((based on climate, weather conditions, foot print of food production, water availability) (GCF)	Design a tool to strengthen the MMAyAs monitoring system of water resources generating up-to-date information about the availability of water resources in quantity and quality over time, climatic and weather conditions, access to water in the target region and agro-food system related to water balance monitoring in a context of climate change. The tool will allow farmers to make informed and effective decision making especially on the use of water resources for agriculture, but also for other uses (domestic, etc) .	58,000	30,160	27,840

ACTIVITY 3.2.1	
Indicator	**Criteria**
1 Online tool for monitoring and dissemination of information.	This activity will contribute to the whole project area.

Component 4: Enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms

123. Activities under this component will aim to strengthen institutional capacities and support Financial Institutions (FIs) in the development of financial products to enhance a long-term resilience building for smallholder farmers. It also aims to improve the capacity of national and sub-national stakeholders involved in the design and implementation of policies, regulations and plans (including Integral Territorial Development Plans, PTDIs) focused on adaptation and mitigation to climate change and linked to integral watershed management and conservation, monitoring of ecosystem functions and services, on-farm climate-proofed irrigation systems and production diversification. Similarly, this component will enable the design and implementation processes of PTDI, targeting land use planning and prioritization of production activities appropriate for sustainable land use, resilience management, and integral watershed management and conservation, among others.
124. Furthermore, due to its participatory and inclusive governance approach, this component will contribute to different indicators of the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth, including those related to governance of the forest and life systems of Mother Earth; participatory processes in territorial management of life systems; local territorial agreements regarding objectives and/or goals for the development of sustainable productive systems with a focus on mitigation and adaptation to climate change; comprehensive support for sustainable production systems; the integrated and sustainable management of forests and Mother Earth's life systems; promoting environmental, food, energy, technological and productive sovereignty with diversification; and comprehensive information and monitoring of the components, environmental functions and life systems of Mother Earth.
125. This component takes a strong, innovative approach to facilitate the identification of financial mechanisms to support long-term climate resilient agricultural production and irrigation systems. In particular, the project will foster partnerships with existing national funders as well as public and private-sector financial institutions to develop innovative financial instruments tailored to enable the implementation of climate-proofed irrigation and ecosystems restoration investments. The project will establish alliances with national financiers and financial institutions such as the Productive Development Bank (BDP), Association of Development Finance Institutions (FINRURAL), FONABOSQUE and the National Institute of Agricultural Insurance (INSA). In

[112] The online tool will be used by all municipalities through the FAM and agreements signed with SENANMHI.

particular, BDP is considering accreditation as a GCF Direct Access Entity and could potential be a partner in support these capacity strengthening efforts. Table 9 provides an overview of the financial instruments, which the project will help to be developed, and suitability for beneficiaries. The project will provide technical assistance for the design and implementation of pilot initiatives for green credits and concessional credits lines for small farmers so that they strengthen their capacity for resilience and adaptation to climate change. In parallel, the project will provide technical assistance for the development of a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds and scale up and increment the number of beneficiaries. The project will as well provide technical assistance to INSA to develop and implement innovative insurance mechanism and to analyze the possibility to expand this activity to other private financial institutions - GCF investment will be targeting the design and piloting of a parametric or indexed micro insurance. The project also will work where appropriate with the other types of financial intermediaries that make up Bolivia's financial sector in support of farmers in the Valles Macroregion, including Multiple Banks, SME Banks, Savings and Credit Cooperatives and complementary financial service providers such as mobile payment service companies and money transfer and remittance companies. These activities will be complemented by capacity development of local communities, smallholders, and local associations on financial management and access to innovative financial instruments to serve as enablers of climate resilient agricultural transformation.

126. Component 4 will strengthen local governance structures on matters related to participatory climate adaptation and early warning systems. Trainings and workshops targeting local stakeholders (including smallholders, public officers, local CSOs, and relevant academia and private sector) are planned to increase their knowledge base on climate resilient agriculture, climate-proofed irrigation and watershed management for climate adaptation and resilience.
127. The role of SENAMHI and MDRyT will be strengthened to ensure the generation and timely dissemination of locally adapted information on meteorological/weather, hydrological, hotspots and forest fires. This information will be disseminated using the coordination and consultative territorial platforms and agro climatic platforms which will be established under the project. These will facilitate climate change adaptation mainstreaming into the participatory design of norms, policies and strategies, and to implement early warning systems for agricultural risks, respectively.

Output 4.1. Strengthening capacities for national and sub-national government entities to implement policies and norms for the climate-resilient food production under irrigation systems, integral watershed management and monitoring of ecosystem functions and services (GCF: 0.28M)

128. In this output, policies and technical standards (for responsible water consumption in irrigation systems and conservation of water sources) will be drafted and implemented to contribute to adaptation and mitigation activities which are linked to watershed management and conservation; monitoring of ecosystem functions and services; and on-farm climate-proofed irrigation systems and production diversification.

Activities	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 4.1.1: Implement national and sub-national policies and plans (including PTDIs) that contribute to climate change adaptation and mitigation processes, contributing to the JAMA and to the Bolivia´s NDCs (GCF).	Support the development and follow up on the implementation of territorial planning instruments (PTDI), with local actors to generate capacities and correct some of the technical problems that occurred with the first version of the PTDI. This will contribute to monitor and implementation of policies at the national and subnational level for climate change adaptation linked to the conservation of watershed, climate-proofed irrigation systems and productive diversification in de macro and micro region Valles (NDC, JAMA)	400	208	192

ACTIVITY 4.1.1	
Indicator	**Criteria**
At least 10 institutions at the national level and the 65 municipalities included in the project have been trained in the design and implementation of policies related to climate change adaptation.	All 65 prioritized municipalities will be trained. ii) National entities will be selected based on their existing work related to the integral management of water and the production of food, as well as mitigation and adaptation to climate change in those areas where project interventions have taken place in components 1, 2 and 3.
24 PTDI updated with local actors that include climate-sensitive planning and decision-making processes related to sustainable water use	The PTDIs will be updated and implemented at the level of the municipalities: i) Municipalities with very high and high risk of extreme weather events.
12 PTDIs implemented	ii) Municipal governments that show willingness to include a specific budget in their annual budget plans for aspects of mitigation and adaptation to climate change

Output 4.2. Improved financial mechanisms that support climate-resilient agricultural production and irrigation systems to mobilize increased finance for farmers (GCF: 1.84M)

129. Agriculture finance and agricultural insurance are strategically important for building resilience to climate change and addressing systemic vulnerability factors surrounding farmers, such as poverty. Despite its widely recognized importance, access to agricultural finance often remains a challenge. Limited access to finance prevents many farmers from adopting new technologies and improving their resilience. Key barriers include:

- A mismatch between the financial needs of farmers and the types of financial products and services available on the market. This includes high interest rates and unfavorable repayment schedules which are not aligned with the seasonal nature of agricultural production cycles;
- High transaction costs due small-scale and dispersed customers, coupled with under- developed customer information systems;
- Limited capital available due to high investment risk, information gaps and asymmetries, and weak risk mitigation mechanisms;
- Seasonality of cash flows for both producers and finance providers, which is exacerbated by climate variability, increases the risk of default.
- Limited access to insurance products and guarantee schemes to cover default risk / underperforming transactions, where both the supply of insurance products and the demand are weak.
- Limited differentiated financial opportunities to those who implement production approaches that contribute to climate resilience and the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth.

130. The GCF funds will provide necessary up-front investments, which together with the technical assistance provided to the financial institutions, will lead to the actual financial mechanisms: 1) Design and implementation of pilot initiatives of green credits and concessional credits lines and provide technical assistance to farmers to access these credit lines and 2) Develop a financial strengthening Plan for FONABOSQUE and 3) Develop and implement innovative insurance mechanisms to INSA. Once the financing mechanisms have been designed, they will be available for wider use beyond the project for example, mainstreaming climate change in the Water Funds and the creation of the index-based infrastructure. The development of new financial mechanisms under output 4.2 will include the following institutions that have already been selected based on historic support they have offered as they currently offering to small scale farmers in the project area based on the legal framework in Bolivia: Productive Development Bank (BDP), Association of Development Finance Institutions (FINRURAL), FONABOSQUE and the National Institute of Agricultural Insurance (INSA).

131. Activities under this output will strengthen and design - together with national and sub-national entities - financial mechanisms for the resilient production of food, installation and maintenance of irrigation systems with a focus on adaptation to climate change. These mechanisms will be more viable and attractive thanks to the interventions in Components 1 and 2 that reduced the risk of climate-related crop losses and strengthen farmers' cash-flows. Training will be provided to relevant stakeholders to improve their capacity to access funding for climate adaptation actions. This output will promote associativity to foster inclusion. This action will facilitate participation in producers' associations as part of efforts to enhance farmers' access to finance, since the association guarantees (under the principle of joint guarantee) the repayment of credit.

132. Project activities will guide the development of a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds and scale up and increment the number of beneficiaries. Additionally, the project will provide specialized Technical Assistance to INSA to develop and implement innovative insurance mechanisms and to analyze the potential for extending this activity to other private financial institutions.

Activities	**Description**	Total No. beneficiaries	No. beneficiaries (males)	No. beneficiaries (females)
Activity 4.2.1: Establish partnerships with existing domestic funders and financial institutions to develop innovative financial mechanisms and instruments that enable the implementation of climate-proofed irrigation, climate-resilient agriculture and investments in ecosystems restoration (GCF).	Co-design -together with public and private national and sub-national entities, as described in Table 9 of the FP- financial mechanisms and instruments for the climate resilient production of food, installation and maintenance of irrigation systems and mountain ecosystems restoration and conservation. This includes the development of market analysis, financial product and instrument co-design, needs assessments for deployment. The partnership includes strengthening the capacities of public/private national/sub-national entities for the	2,224	1,156	1,068

	development of tailored financial instruments and mechanisms.			
Activity 4.2.2: Strengthen the capacities of communities, smallholders and associations on financial literacy, management and access to innovative financial instruments relevant for climate resilient agriculture, ecosystems conservation schemes, climate-proofed irrigation systems (GCF).	Stakeholders (communities, smallholders and producers associations) will be trained to ensure they are enabled to access and manage finance for climate resilient agriculture, ecosystems conservation schemes, climate-proofed irrigation systems	20,680	10,754	9,926

ACTIVITY 4.2.1	
Indicator	**Criteria**
At least 10% of the loan portfolio for production and irrigation has been reactivated and/or increased. One risk-indexed micro insurance designed and implemented. One funding mechanism designed and implemented for the water funds. At least 1 green financial mechanism for production and irrigation loans targeting women and young producers has been designed and is being implemented. One financial Strengthening Plan for FONABOSQUE	This activity will benefit the whole project area
ACTIVITY 4.2.2	
One methodology designed. 20,680 persons trained. At least four roundtables realized.	i) Family farmers living in areas with very high and high risk of droughts, hailstorms and floods especially those farmers who have benefitted from project interventions in components 1, 2 and 3. ii) Family farmers who are members of irrigation associations. ii) Family farmers producing products for basic food supply

133. Table 9 below shows the link between the financial mechanisms, key actors and the resilient agroecological management and technologies which they can further support after the project ends. (1) Design and implementation of pilot initiatives of green credits and concessional credits lines and provide technical assistance to farmers to access these credit lines. The project will establish alliances with national financiers and financial institutions like BDP (Productive Development Bank) and FINRURAL (Association of Development Finance Institutions), to provide technical assistance to design and implement pilot initiatives of green credits and concessional credits lines for small farmers so that they strengthen their capacity for resilience and adaptation to CC. 2) Capacity building to the producers so they can improve their access to credits with unconventional guarantees more expeditiously, considering the important demand for these services.
134. (2) Develop a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds and scale up and increment the number of beneficiaries - project interventions will develop a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds and scale up and increment the number of beneficiaries.
135. Real guarantees are the traditional means used to guarantee loans, for example, for a loan for the purchase of a house, the guarantee will be the mortgage of the same house or a loan for the purchase of a car, the guarantee will be the same vehicle. Non-conventional guarantees are aimed at facilitating the obtaining of loans from the productive sector, so the client can present as collateral the ownership papers of a piece of land in the rural area, the products produced by the client, a literary or artistic work, an invention, among others. Non-conventional guarantees will go through a process of evaluation, assessment and corresponding registration. Despite the existence of portfolios for financing small farmers under non-conventional guarantees, to date it has not been possible to implement an agile and differentiated procedure for agricultural or natural products, limited to non-conventional guarantees, which hamper access to reimbursable financial support. Through these innovative financial mechanisms, RECEM Valles will also seek to strengthen the capacities of banking institutions in general, especially of BDP, given that this institution is in the process of accreditation as an DAE (Direct Access Entity) to the GCF by the will and mandate of the Bolivian state. In terms of agricultural insurance, although INSA has made fundamental advances, these have been limited to the Altiplano macro-region, with the task and challenge of designing insurance for products in

Bolivia's valleys, the most significant being vegetables, fruit and corn. The following considerations will be taken into consideration for the financial mechanisms:

- Loans will not be processed with farmers who do not have a history of agrarian property rights or executory title as a result of the land reorganization established by Law No. 1715.
- The non-conventional guarantees will be aimed precisely at generating new types of non-conventional guarantees that guarantee the payment or recovery of the unpaid credit.
- The insurance does not apply to farmers who do not have consolidated agrarian property and/or are not accredited by an individual or communal executory title and/or are in the process of agrarian proceedings.

See more information of the financial mechanisms in Table 42 of the Feasibility Study – Annex 2.

Table 9. Overview of the financial instruments that the project will support to ensure climate resilience and project sustainability.

Financial mechanism	Actors	Project interventions to mobilize finance via the mechanisms
Climate resilient credits and concessional credits lines	Productive Development Bank (BDP), Foundation for Productive and Financial Development (FINRURAL)	***Customizing agriculture financial products and services for climate resilient agriculture:*** The project will *provide the following technical assistance*: (i) assess and map the needs of and impediments for farmers (especially smallholder farmers) to engage in climate resilient agriculture; ii) map the current range of products that BDP and FINRURAL provide to the farmers (iii) integrate principles of climate resilience (both ecological and social) into their portfolios of products and services; (iv) conduct research on effective and affordable innovations related to credit assessment, financial products, and delivery mechanisms; (v) design, test and implement climate resilient credits and concessional credit lines that are customized to climate resilient agriculture (primarily to smallholders); better address the needs of borrowers. These products will foster climate resilient, biodiverse, and restorative agriculture of ecosystem functions and services. ***Foster measure to enable agriculture financing policies:*** The Project will provide technical assistance for designing and implementing financing policies as follows: i) conduct legal and administrative mapping of barriers that prevent an increase in agricultural financing; (ii) design technical guidelines related to the current legislation to establish the climate resilient credits and concessional credits lines; (iii) develop and implement an incidence strategy to promote public agriculture financing and private investments in climate resilient credits and concessional credits lines and (iv) design the eligibility criteria for the financial products to determine the benefits that small farmers will receive from climate resilient credits and concessional credit lines.
National funding	FONABOSQUE	***Technical assistance for FONABOSQUE to improve and implement the financial program for sub-national governments at the Valles Macro region:*** Considering that sub-national governments are among the beneficiaries of FONABOSQUE, the project will provide technical assistance for the improvement of the FONABOSQUE financing program tailored to the requirements of departmental, municipal, and sub-municipal governments located in the Valles macro-region. This will be undertaken through an actor-oriented process, within which the staff of FONABOSQUE and sub-national governments, together with members of the consultative territorial platforms (to be established by the project) will work together to define the scope and priorities of the program - focusing on integral micro-watershed management and restoration of ecosystem functions and services for climate change resilience. In this regard, the technical assistance will ensure that FONABOSQUE financing program integrates the inclusion of climate change mitigation and adaptation based on integrated forest management and restoration of conservation easements and water sources, as well as carbon sequestration and sequestration, soil organic matter.

		Strengthening capacities of FONABOSQUE's staff in climate-resilient approaches: The project will provide capacity building to the executive and technical personnel of FONABOSQUE, to develop their understanding of integral micro-watershed management, restoration of ecosystem functions and services for climate change resilience, with a view to include such products in their financing criteria. ***Strengthening capacities of sub-national governments in development of funding proposals to FONABOSQUE:*** Sub-national government staff and participants of the consultative territorial platforms will be trained in the formulation of proposals, to be presented to FONABOSQUE, for financing integral micro-watershed management and restoration of ecosystem functions and services for climate change resilience. ***Strengthening capacities the territorial platforms to prioritize co-financing allocations for climate resilient projects***: Considering that FONABOSQUE provides a maximum funding of 70% of the total project costs, RECEM Valles will train the consultative territorial platforms in designing and prioritizing annual public budgets. This will enable the 30% of local, public contribution to implement the projects to be submitted to FONABOSQUE.
Risk-indexed micro insurance	National Institute of Agricultural Insurance (INSA)	In terms of agricultural insurance, the project will initiate the development and implementation of a specific agricultural insurance for the Valleys Macro region, which will consider the application of non-conventional guarantees, and generate economic and productive reactivation processes and investment in traditional agri-food systems that are resilient to climate change. ***Design of the risk- indexed micro insurance:*** The project will provide technical assistance in the design of the risk-indexed micro insurance for the Valles Macro region in a highly participatory manner. In this regard, roundtables will be organized to provide a platform to engage between farmers, INSA and relevant stakeholders, to ensure that the design takes into consideration the needs and the local situation of the most vulnerable farmers. ***Design and dissemination of the implementation methodology:*** Technical assistance will be provided to support the design of a methodology for implementing and accessing financial and insurance mechanisms, The methodology will also include operational details and a strategy for roll-out and scaling up the risk-indexed micro insurance to other insurance institutes and other geographical areas within Bolivia. ***Capacity building of relevant local actors***: smallholder farmers and their organizations, will receive capacity building support on the relevant procedures required to secure insurance against damages (to their produce) caused by climate events and natural disasters. To be able to deliver on the capacity building, educational material will be developed in innovative formats targeting the most vulnerable farmers. The capacity building will include disseminating the agroclimatic information necessary to apply agriculture risk reductions practices to avoid losses. ***Provision of agro climatic information relevant to insurance decision-making***: Through the institutional strengthening of public information services (such as SENAHMI and MRDyT). The project will help to enable agro climatic platforms and the meteorological, weather and hydrological information. This will enable constant access for INSA and its beneficiaries, to the information required for decision making about production planning and protection. With this, the project will enable wider access to insurance products for the most climate vulnerable smallholder farmers.

Water Funds	Water Fund Tarija, Santa Cruz Water Fund, Agrarian Union Taquiña Cochabamba, and National Bolivian Brewery	***Improvement of water fund mechanism:*** Staff of the different water funds will receive technical assistance to ensure that their funds are designated towards the improvement of on integral micro-watershed management, restoration of ecosystem functions and services, and climate resilient agriculture. The technical assistance will aim to: 1. Develop a line of financing for mitigation and adaptation to climate change, with the aim of generating sustainable and resilient agricultural practices, revitalizing irrigation systems through the technification of the current flooding system, conserving water sources and recovering ecological easements, as well as preventing and controlling agricultural risks. 2. Revise the funding criteria and the funding mechanism, including improved monitoring and evaluation frameworks as it relates to climate change adaptation and mitigation to be able to report on the implementation of the funds and hence contribute to the PDES and the NDCs sectoral strategies. ***Capacity building of potential beneficiaries***: Through the project, smallholder farmers, their organizations and the consultative territorial platforms, will receive capacity building on the relevant procedures and requirements to enable the farmers to access the water funds.

Output 4.3. Strengthening local governance in participatory climate adaptation, early warning systems and long-term monitoring systems (GCF: 1.6M, CO-FINANCING: 0.3M)

136. Activities under this output will ensure local governance structures have strong capacity to enable the sustainability of the climate-adaptation investments beyond the project span. In particular, the National Service for Meteorology and Hydrology (SENAMHI) and the Ministry of Rural Development and Lands (MDRyT) will improve their capacities for information and data generation and dissemination. This information will be channeled through coordination and consultative territorial platforms and agro climatic platforms (to be established under the project) with differentiated roles and objectives.
137. Lastly, systematic evaluation of damages and losses to agriculture, caused by natural disasters, in the Valleys Macro-region will be facilitated through: the development of common methodologies; and strengthening capacity for the collection and analysis of data. This output will also contribute to collect and analyze data for impact evaluation and knowledge management of lessons learned.

Activities	**Description**	**Total number of beneficiaries**	**Number of beneficiaries males**	**Number of beneficiaries females**
Activity 4.3.1: Capacity strengthening for local stakeholders (including smallholders, public officers, local CSOs and relevant academia) on the integration of climate change risks for decision making to increase the resilience of smallholders and communities (GCF).	Strengthen institutional capacities to govern the Early Warning System for Agricultural Risks' implementation process to provide timely information to local producers and decision-makers through the Coordination and Consultative Territorial Platforms as key channels of information for the smallholders and communities.	800	416	384
Activity 4.3.2: Establish coordination and consultative territorial platforms[113] to facilitate climate change adaptation mainstreaming into the participatory implementation of policies and strategies), in accordance with the Comprehensive	Strengthen Coordination and Consultative Territorial Platforms in line with Comprehensive Management Plan for Watershed Resources and Integrated Watershed Management and	800	416	384

[113] These platforms are governance mechanism common in Bolivia, in which representatives of local state and non-state actors get together to carry out thematic technical and policy-analysis work, among others.

Management Plan for Watershed Resources and Integrated Watershed Management (GCF).	facilitate key stakeholders in decision making processes			
Activity 4.3.3: Enhance capacity of Municipalities to strengthen the monitoring and reporting base for the macro region related to climate change impacts (CO-FINANCING).	Strengthen the capacity of municipalities in using mainstreamed methodology to assess the damage and economic losses of (extreme) climate change as well as gathering the data and information related to the monitoring of the project indicators. This activity will be implemented and co-financed by FAM.	400	208	192
Activity 4.3.4: Impact evaluation and developing knowledge management products (GCF)	Knowledge generation and documentation of evidence of the impact from the project, lessons learned and best practices.	81,551	42,407	39,144

ACTIVITY 4.3.1	
Indicator	**Criteria**
At least 80% of the municipalities established protocols for EWS dissemination.	i) Family farmers living in areas with very high and high risk of droughts, hailstorms and floods especially those farmers who have benefitted from project interventions in components 1, 2 and 3. ii) Public officers, local CSOs and relevant academia with linkages to project areas where project interventions of components 1, 2 and 3 have taken place
ACTIVITY 4.3.2	
At least 7 territorial platforms for comprehensive and resilient water management and sustainable production systems have been strengthened and/or set up.	i) Municipalities where family farmers are residing that have very high and high risk of droughts, hailstorms and floods especially those municipalities who have benefitted from project interventions in components 1, 2 and 3. ii) Areas of family farmers producing products for basic food supply iii) Municipal governments that show willingness to include a specific budget in their annual budget plans for aspects of mitigation and adaptation to climate change

B.4. Implementation arrangements (max. 1500 words, approximately 3 pages plus diagrams)

Governance

138. The following governance mechanisms for project execution, coordination and oversight have been agreed in close consultation with the Ministry of Environment and Water (MMAyA – on behalf of the GoB) and the Federation of Associations of Municipalities (FAM)
139. FAO will serve as both Accredited Entity (AE) and Executing Entity (EE) (GCF proceeds) for this project with a set-up that supports strong government ownership and implementation and serves the capacity development objectives of the project. The GoB, acting through MMAyA, and the FAM will also be Executing Entities for the activities that are funded with their own resources (see table 10).

Accredited Entity Role

140. In its role as AE, FAO will be responsible for the overall management of this project, including: (i) all aspects of project appraisal; (ii) administrative, financial, and technical oversight and supervision throughout project implementation; (iii) ensuring funds are effectively managed to deliver results and achieve objectives; (iv) ensuring the quality of project monitoring, as well as the timeliness and quality of reporting to the GCF; and (v) project closure and evaluation. FAO will assume these responsibilities in accordance with the detailed provisions outlined in the GCF policies as well as Accreditation Master Agreement (AMA) and Funded Activity Agreement (FAA) between FAO and GCF.
141. To perform these AE functions, FAO will set up a FAO-GCF project supervision team comprising relevant staff from the FAO Country Office in Bolivia, the FAO Regional Office for Latin America and the Caribbean in Santiago (Chile), and FAO

Headquarters in Rome. The project supervision team will remain independent of the EE functions also performed by FAO (see below).

Executing Entity Role

142. FAO will also act as Executing Entity and it will be responsible for the management of the GCF proceeds and will bear the overall responsibility for fulfilling the EE functions of this project.
143. More detailed implementations arrangements of the project are described in Figure 10 (below).

Project Implementation Arrangements

144. The project will be implemented under the following structure:

a. **FAO,** the AE, will act as the EE for all GCF-funded project activities and will be responsible for the GCF proceeds. In this context, FAO Office in La Paz- Bolivia will set up a Project Management Unit (PMU) with project-recruited staff. This PMU will coordinate the work of four Territorial Operating Units (TOUs). Led by the PMU, these units will collectively perform all EE functions on this project, including (inter alia) the preparation of Annual Work Plans and Budgets (AWPBs) in collaboration with key government counterparts, and the overall day-to-day project management, monitoring project progress, and reporting to the Project Steering Committee (PSC) and FAO-GCF project supervision team. These units will work with relevant partners to deliver individual outputs and activities, as outlined below. Along with specialized FAO technical experts who will directly support the project, the project-recruited staff and government staff in the PMU and TOUs will collectively comprise a project delivery team. This project delivery team will lead the execution of all GCF-funded activities included in this project. FAO will ensure that there is no direct overlap between (i) these staff who comprise the project delivery team, and (ii) the staff who comprise the project supervision team and fulfill FAO's AE functions. This will ensure built-in project oversight and supervision functions are fulfilled.
b. **The GoB, acting through MMAyA, and FAM** will be EEs for activities funded by their co-financing resources. As such, they will be responsible for managing and executing their co-financing funds but will not execute any GCF Proceeds. The GoB, acting through MMAyA, and FAM will coordinate the implementation of these activities through the Project Steering Committee.
c. The **PSC** will be responsible for the highest level of project governance, and will guide overall project implementation, ensuring inter-institutional coordination. The PSC will be comprised of high-level representatives from MMAyA, MDRyT, MDP, FAM, and FAO. MMAyA will chair the PSC and FAO will act as the Secretariat. FAO will keep the documentary and logistical record for the operation of the PSC. Final decisions of the PSC will require the consent of the Accredited Entity.
d. A **Technical Committee (TC)** will be responsible for the overall project coordination and for ensuring its strategic approach, coordination among the partners and consistency of the outputs with the project's strategic framework. The TC will be comprised of technical staff from MMAyA, MDRyT, MDP, FAM, and FAO. MMAyA will chair the TC and FAO will act as the technical secretariat and provide support to the TC. The Executing Entities through Steering will retain final decision-making over the implementation of the Project and the use of proceeds and other final decisions and approvals
e. A **Project Management Unit (PMU)** will be responsible for the implementation of the project. The PMU is the technical-administrative unit for the project. The personnel for the PMU and TOUs will be procured and hired by FAO. The PMU coordinator and a team will be hosted in the offices of MMAyA in La Paz. The PMU will coordinate and support project implementation, performing day-to-day implementation, coordination, and supervision activities during the project lifecycle, operating in close consultation with the governing structures of the project. While the PMU will be located physically at MMAyA's offices, it will remain under the supervision of FAO, as EE of the GCF proceeds. The PMU will follow FAO´s operative procedures and will operate according to AWPBs approved by the TC. Key administrative matters of the project (including procurement and financial plans, periodic reports, etc.) will be approved by the TC. The PMU will include the following staff (*inter alia*): (i) Project Coordinator, (ii) Finance assistant, (iii) M&E Specialist, (iv) Gender Specialist, (v) Knowledge Management Specialist, and (vi) Administrative assistant. All roles and responsibilities of PMU staff are described in more detail in Section 19 of the Feasibility Study.
f. Four **Territorial Operating Units (TOUs)** working at the local level will be established to serve as the key channel of communication between the PMU and local stakeholders and to assist with the implementation of activities on the ground. TOUs will be located in Cochabamba, Potosí, Sucre, and Tarija. Each TOU will be headed by a Regional Project Director, supported by technical staff including, for example, (i) Agronomists, (ii) Farmer Field School Specialists, (iii) Gender and Nutrition Specialists, and (iv) Safeguards Specialists, as appropriate. The Regional Project Director will ensure effective liaison and coordination with the PMU and other TOUs during the implementation of the project activities.

145. The governance and implementation structure and flow of funds for the project are shown below (Figure 10).

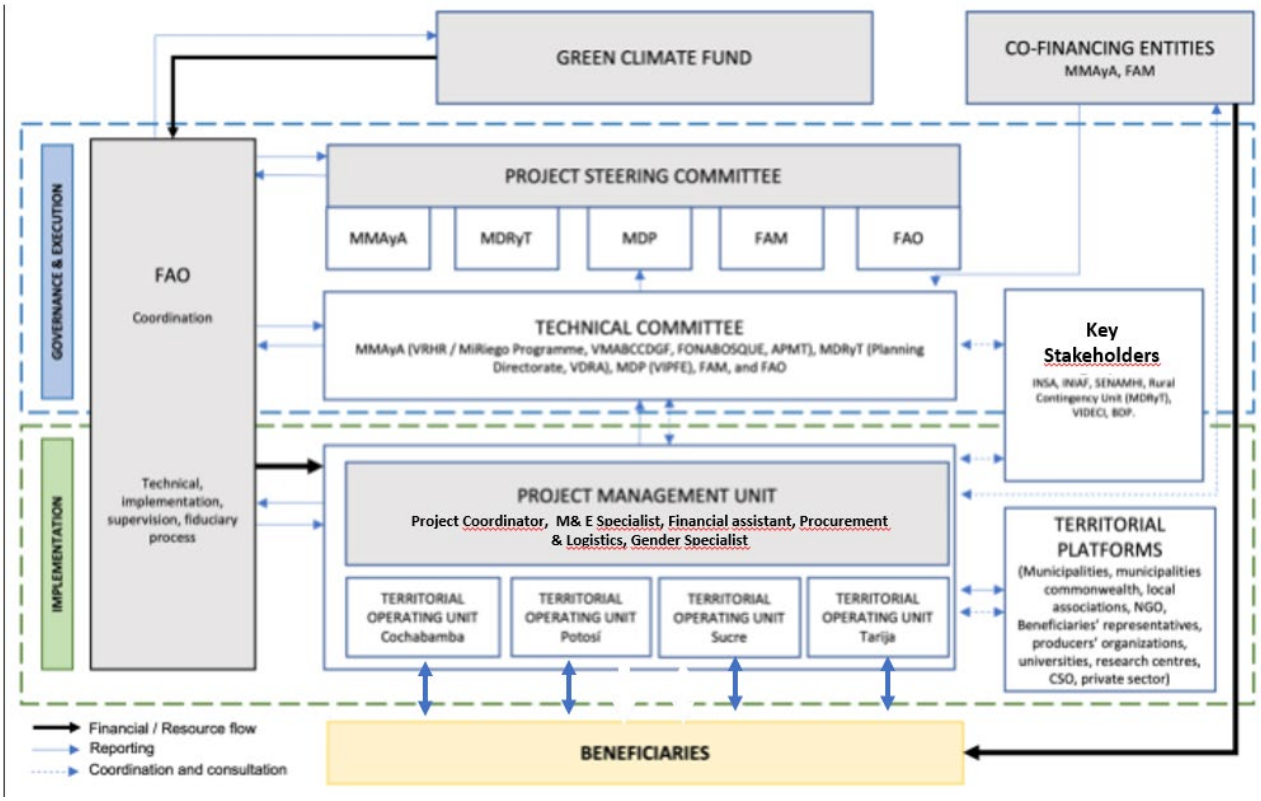


Figure 10. Governance structure of the project.

Annual reports

146. The PMU will prepare Annual Reports for each year of implementation and FAO will review/clear them. The Project Director of the PMU and the M&E Specialist will ensure that the indicators in the results framework are monitored and reported annually. Annual Reports will be shared with the PSC, TC and other stakeholders. Annual Reports will be due to GCF 60 days after the end of the calendar year. The final Annual Report and the terminal evaluation report will serve as the final project report package.

Table 10. Roles and responsibilities of the key governance entities

Institution	Responsibilities
Project Steering Committee (PSC)	• Provide political and strategic orientation to the implementation of the project. • Recommend strategic elements based on the project progress, results and impacts. • Ensure alignment of the project with national policies. • Ensure transparency of processes. • Promote ownership of actions for addressing climate issues by national authorities. • Ensure sound inter-institutional coordination. • Ensure that co-financing is delivered in a timely manner.
Technical Committee (TC)	• Review and approve annual work plan and budgeting. • Monitor implementation, and safeguards compliance. • Invite, where relevant, to partner entities representatives or other relevant institutions to participate in special informative meetings. • Mobilize timely technical expertise from the participating institutions as per the agreed work plan. • Serve as a key channel of communication between PMU and key local stakeholders. • Assist in the implementation of the stakeholders' participation and engagement plan. • Assist in communication strategy of the project at the local level.

Project Management Unit (PMU)	● Prepare AWPBs for review and approval by the TC and FAO. ● Report on annual/semiannual basis to FAO (results base, financial progress, etc) to complete the Annual Performance Reports (APR) to be submitted to the GCF and request of subsequent disbursements. ● Establish and supervise TOUs for project implementation at the local level. ● Ensure that recommendations by TOUs are discussed and addressed ensuring project adaptive management. ● Manage the procurement, contracting, administrative and accounting process needed under the direct and permanent control, monitoring, and supervision of FAO. ● Collect data and ensure reporting to the PSC is in accordance with the reporting to be provided to GCF.
FAO	● Responsible for the reporting, monitoring, implementation and fiduciary management of activities funded by GCF Proceeds. ● Responsible for the reporting, monitoring, implementation, and financing of the co-financed activities. ● Responsible for supervising the performance of the PMU and the timely delivery of management services provided by the PMU.
MMAyA	● Member of the Steering committee in charge of ensuring the integrated management of water resources for irrigation and food security, as well as the integrated management of the environment and life systems to Live Well. ● Responsible for managing and executing co-financed funds provided. ● Co-financier
FAM	● Member of the Steering committee that will ensure participation of selected municipalities in the project execution ● Responsible for managing and executing co-financed funds provided. ● Co-financier
MDP	● As National Designated authority, it will supervise that project activities comply with the country's national priorities for Climate Change
MDRyT	● Member of the steering committee in charge of ensuring that the implementation of the project produces decent employment for producers, communities, farmer and indigenous economic organizations and the business sector, under the principles of quality, equality, inclusion, transparency, reciprocity and cultural identity for food safety and sovereignty to Live Well.

Financial flows

147. FAO is the AE and will act as the EE for GCF-funded project activities. FAO, in its role of EE, will manage GCF funds, by verifying financial expenditures against budgets, making payments, and providing technical and secretariat assistance to the PSC and TC. The GCF and FAO will enter into a Funded Activity Agreement (FAA), under which FAO shall administer the relevant GCF Proceeds to be used for the financing of the project, in accordance with the FAA and AMA. Accountability on the use of financial resources will be facilitated through the review of annual and bi-annual project reports, as well as through audit and monitoring reports.
148. The GoB, acting through the MMAyA, and FAM will be the co-financiers of the Project. As such MMAyA and FAM will be EEs for activities funded by their co-financing resources and will not execute any GCF proceeds. Instead, these institutions will be solely responsible for the management and execution of their co-financed funds.
149. FAO in its role of AE shall sign a Project agreement with the GoB, which will:

- Cover the host country obligations;
- Include the obligation of MMAyA to provide its co-financing;
- reflect the governance arrangements;
- govern the implementation of the project activities entrusted to MMAyA;
- be legally binding;
- detail the roles and responsibilities of FAO and MMAyA;
- contain the relevant provisions for FAO's compliance with the requirements from the AMA and FAA that need to be transferred to the co financiers and co executing entities;
- contain provisions on the applicability of the Convention on the Privileges and Immunities of the Specialized Agencies (the "the Specialized Agencies Convention") to FAO, including to the GCF Proceeds held by FAO.

FAO will sign a second agreement with the FAM, which will cover the relevant obligations of FAM as Executing Entity and Co-financier. For the avoidance of doubt, both the project agreement with the GoB and the agreement with FAM are subsidiary agreements.

150. MMAyA and FAM will be directly accountable to FAO for the performance of their respective obligations listed under each of the *Agreements* respectively signed with FAO as AE.

151. Every year the PMU will prepare an AWPB including a rolling procurement plan for the next 18 months. The TC will approve the plan and FAO will spend funds according to its covenants, rules, and standards. A yearly financial and results-based report will be submitted to the GCF. Co-financing resources will be managed directly by MMAyA and FAM. GCF Proceeds will not be disbursed nor channeled through the GoB.

152. Figure 11 shows the flow of funds according to formal agreements between GCF, FAO and the two entities providing co-financing.

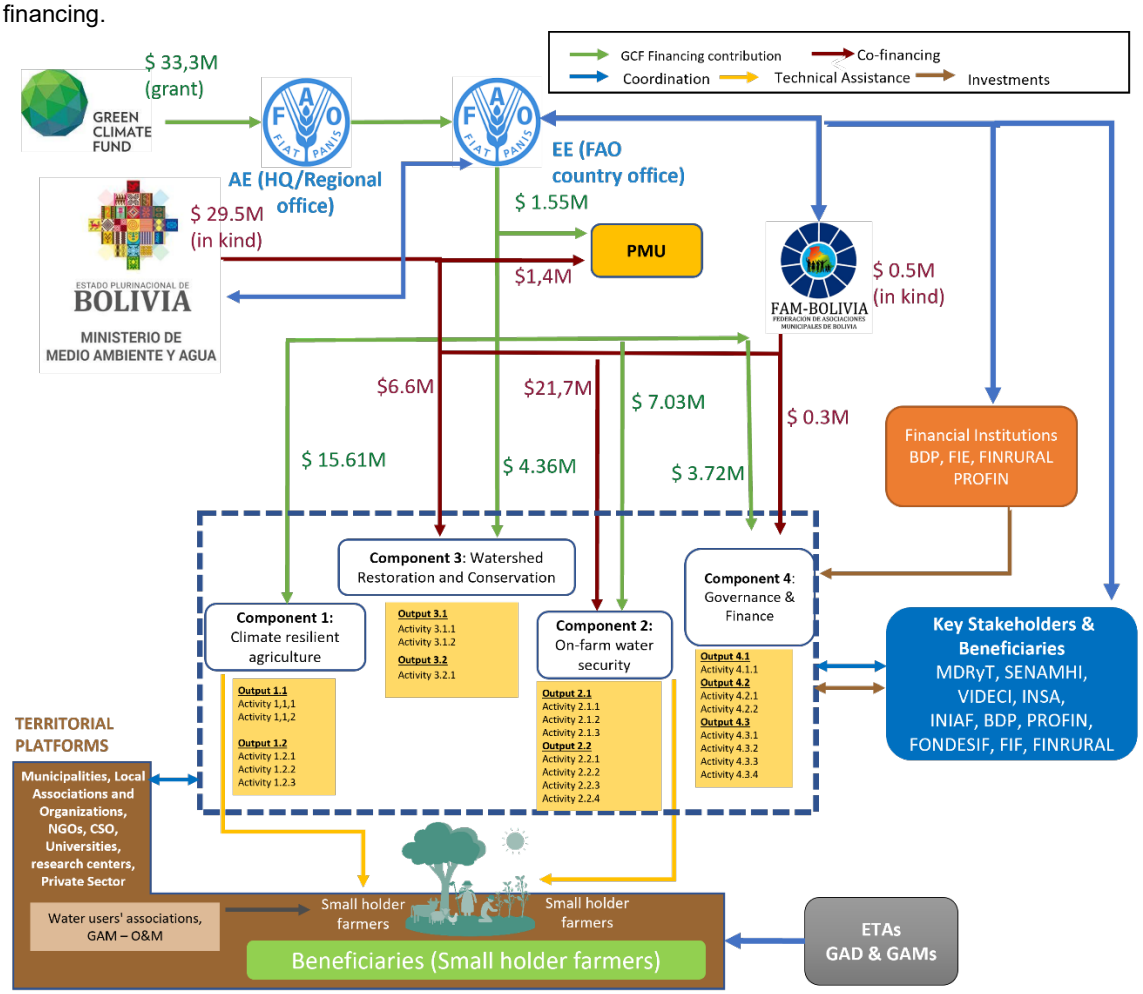


Figure 11. Flow of funds according to formal agreements between GCF, FAO and the 2 entities providing co-financing.

153. The GCF Proceeds will be administered by FAO as Accredited Entity responsible for the overall quality assurance and oversight of the project. FAO is the sole Executing Entity for all GCF-funded project activities. The GoB, acting through MMAyA, and the FAM will act as EEs for activities funded by their co-financing resources, managing and executing these funds and will not execute any GCF Proceeds. MMAyA and FAM will coordinate the implementation of these activities through the Technical Committee and under the project Steering Committee supervision.

154. Under this approach, each Component will have co-financing as follows: In the case of Components 2 and 3, in-kind co-financing comes from the Ministry of Environment and Water (MMAyA). Finally, Component 2 and 4 will receive in-kind co-finance from the Federation of Municipalities Association (FAM) to strengthen the capacities of the municipalities participating in the project, on issues related to management of risks and governance of natural resources.

155. The GCF project will also foster the participation of strategic stakeholders/beneficiaries in the project activities, such as MDRyT (Ministry of Rural Development and Lands), SENAMHI (National Service for Meteorology and Hydrology), VIDECI (Vice-Ministry of Civil Defense). Figure 12 shows the flow of funds – indicating leverage of funds as a result of the GCF investment. Table 11 provides details regarding the specific activities, funding sources and responsible EE.

Figure 12. Flow of funds – indicating leverage of funds as a result of the GCF investment.

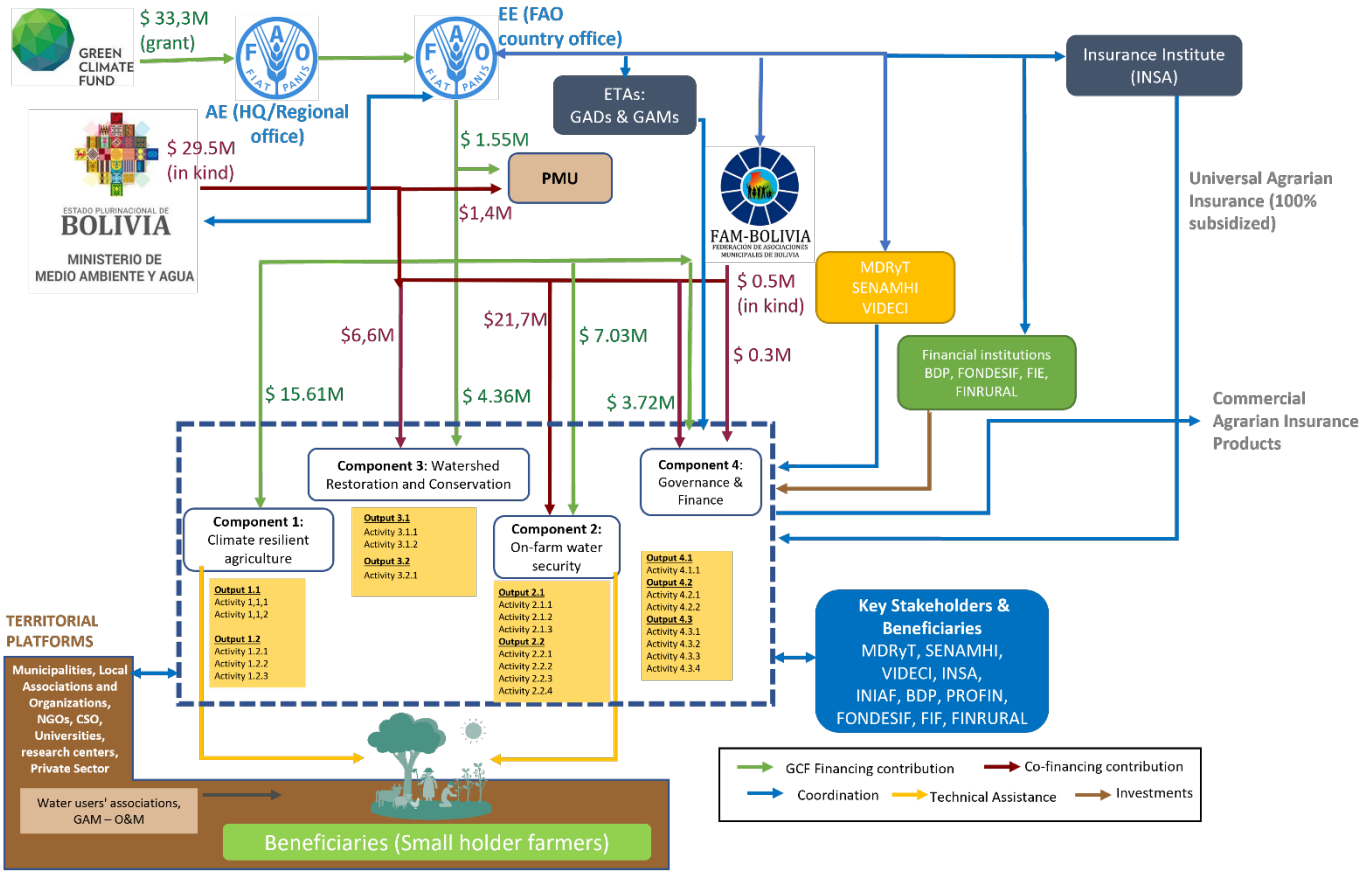


Table 11. List with activities, funding sources and responsible EEs

	Financing/Co-Financing (million (USD)	Financing source	Executing Entity (EE)	Activities
Output 1.1 Climate resilient agriculture implemented and managed by smallholders for increasing the productivity and sustainability of their agroecosystems	F: 11.31 M	GCF	FAO	Activity 1.1.1 Activity 1.1.2
Output 1.2 Support on market access and development for climate resilient agricultural products	F: 4.3 M	GCF	FAO	Activity 1.2.1 Activity 1.2.2. Activity 1.2.3.
Output 2.1 Enhanced and modernized on-farm climate-proofed irrigation systems	F: 5.20 M	GCF	FAO	Activity 2.1.1 (1) Activity 2.1.2 Activity 2.1.3
	CF: 20.5 M	MMAYA	MMAYA	Activity 2.1.1 (2)

Output 2.2 Strengthened capacities for the management of on-farm climate-proofed irrigation	F: 1.83 M	GCF	FAO	Activity 2.2.1. Activity 2.2.3
	CF: 1.0 M	MMAYA	MMAYA	Activity 2.2.2
	CF: 0.2 M	FAM	FAM	Activity 2.2.4
Output 3.1 Restored and conserved ecosystem management for enhanced climate resilient watersheds	F: 3.85 M	GCF	FAO	Activity 3.1.1 Activity 3.1.2 (1)
	CF: 6.6 M	MMAyA	MMAyA	Activity 3.1.2 (2)
Output 3.2. Information and long-term monitoring system for water sources at place.	F: 0.51 M	GCF	FAO	Activities 3.2.1
Output 4.1 Strengthening capacities for national and sub-national government entities to implement policies and norms for the climate-resilient food production under irrigation systems, integral watershed management and monitoring of ecosystem functions and services	F: 0.28 M	GCF	FAO	Activity 4.1.1.
Output 4.2 Improved financial mechanisms that support climate-resilient agricultural production and irrigation systems to mobilize increased finance for farmers	F: 1.84 M	GCF	FAO	Activity 4.2.1 Activity 4.2.2.
Output 4.3 Strengthening local governance in participatory climate adaptation, early warning systems and long-term monitoring systems	F: 1.6 M	GCF	FAO	Activity 4.3.1 Activity 4.3.2 Activity 4.3.4
	CF: 0.3 M	FAM	FAM	Activity 4.3.3.

156. **For Component 1**, GCF proceeds will be executed directly by FAO and will be utilized to:

- The implementation of climate-resilient technologies such as thermal blankets, anti-hail nets, hydrogels and solar tents. These technologies will be disseminated among the beneficiaries of the project with due technical assistance to guarantee their proper implementation and maintenance.
- Promote sustainable and resilient agriculture through practices such as conservation agriculture, crop rotation, productive diversification and agroecological production to the farmers.
- Preparation of Land Use and Communal Management Plans in coordination with MDRyT (Ministry of Rural Development and Lands), Municipalities and INIAF (National Institute of Agricultural and Forestry Innovation)) to guarantee the sustainable use of the land.
- Identification of products of high commercial value and products
- Comply with the national regulation of the participatory guarantee systems (third party certification system for peer-to-peer verification of organic farming standards) (Law 3525) for each producer family and community participating in the project, as well as the analysis of fair prices
- Implementation for collection and marketing centers for agroecological products.
- The promotion and participation in fairs to promote the products to achieve access to national and international markets.

157. **For Component 2**, GCF proceeds will be executed directly by FAO and will be utilized to:

- Develop and implement resilient irrigation technologies for efficient use of water.
- Purchase of irrigation system supplies to optimize the efficient use of water on - farms, reduce the risks of droughts and low rainfall generated by the effects of climate change.
- Establishing small-scale irrigation infrastructure and technologies. Such as community reservoirs and family water tanks, drip and sprinkler irrigation technologies, lining of irrigation canals and improved storage to reduce seepage and other losses
- Updating an inventory of irrigation systems at municipal level and farmer level.
-

158. **For Component 3**, GCF proceeds will be executed directly by FAO and will cover the costs of:

- An inventory of water sources and calculation of water balance throughout the Project area
- Development of integrated watershed management plans and local water use plans, as well as
- Implementation of wetland restoration measures to protect and conserve ecosystem functions and services that will stabilize water supply for irrigation purposes in the micro-watersheds.
- The identification and evaluation of environmental functions restored as climate change adaptation strategy, including as co-benefit the potential of carbon fixation and capture of the biomass and soil.

159. Finally, for **Component 4**, the GCF proceeds will be executed directly by FAO and will finance:

- Design of Territorial Development Plans for comprehensive development
- Identification and implementation of mechanisms for the dissemination and institutionalization of the National Early Warning System to ensure that this information reaches the producer for proper decision-making.
- Strengthening the Coordination and Consultative Territorial Platforms through technical assistance and sharing of lessons learnt. Design and implementation of pilot initiatives of green credits and concessional credits lines and provide technical assistance to farmers to access these credit lines
- Develop a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds, scale up, and increment the number of beneficiaries.
- Provide specialized Technical Assistance to INSA to develop and implement innovative insurance mechanism and to analyze the possibility to expand this activity to other private financial institutions.
- Generation and collection of evaluative data, and impact evaluation for the project.

Track record of FAO role as AE and EE

160. FAO is a specialized agency of the UN that promotes development cooperation in its member countries on issues of food and agriculture, aiming at the goal of food and nutritional security for all (SDG1) and increasingly focusing, under its strategic programs, on the generation of resilience capacities in member countries through policy guidance and technical assistance at national and local level, in response to climate change, the deterioration of natural resources and degradation of ecosystems. At a global, regional, and country level, FAO has specialists who provide technical support to government entities through concrete actions to support priority public policies and technical assistance programs of the countries in line with the global strategic programs and regional initiatives. This project is aligned with the Latin America and the Caribbean the FAO strategic priority (SP) SP1 (Help eliminate Hunger, food insecurity and malnutrition), SP2 (Make agriculture forestry and fisheries more productive and sustainable), and SP3 (Increase the resilience of livelihoods to threats and crises). Furthermore, the project is in line with the three FAO regional initiatives (RI) approved in its LARC-36 (36th FAO Latin American Regional Conference) in October 2020; however, it focuses on RI3 (Sustainable and resilient agriculture). The initiatives promoted and supported by FAO are guided by its Governing bodies with Ministries of Agriculture, Forestry and Fisheries and related institutions regarding land and water resources and informed through lessons learned and knowledge acquired and developed in multiple scenarios around the world and widely shared (FAOStat, publications, workshops, e-learning materials).

161. FAO will make available to the project its methodologies to support public policies, capacity development, rural development with a territorial approach, and knowledge management through multi-stakeholder and intersectoral processes. Likewise, FAO has legal status and the institutional credentials in Bolivia that permits it to interact formally and permanently with the various national and subnational government institutions, the public and private sectors, as well as with the direct beneficiaries comprising the family farmers and indigenous and community organizations of Bolivia, providing a neutral forum to conciliate and agree on public policies and support food and agricultural strategies and actions.

FAO Bolivia

162. The FAO Representation is in Bolivia since 1978, providing technical assistance for the development of local, municipal, regional and national policies, programs and projects focused on eliminating hunger and malnutrition, especially supporting vulnerable populations against the adverse effects of climate change through risk reduction management projects. Currently,

the Organization is working in the whole country: Northern Altiplano, Southern Altiplano, Valles, and Amazonia, including rural, urban and peri-urban areas. During the last five years FAO have been improving living standards of families in relation to food insecurity and high indexes of poverty, strengthening capacities in their communities, organizations and territories, contributing to food security with sovereignty, respecting territorialities and ancestral knowledge, in line with the Bolivian regulation.

163. FAO Bolivia has a robust fiduciary and technical oversight and quality assurance system with specific functions carried out by a segregated quality assurance process, which include FAO-Bolivia Country Office, the Regional Office for Latin America and the Caribbean (RLC), and Headquarters. This process ensures independent project oversight and monitoring. In RLC, there is a team of officials and specialist consultants in the areas of forestry, natural resources, risk management, and climate change, who are available to assist with the implementation of the project, in coordination with FAO Headquarters personnel. In addition, The FAO Bolivia office has professional full-time staff and specialized national consultants with a wide thematic experience to support the implementation of the project.

B.5. Justification for GCF funding request (max. 1000 words, approximately 2 pages)

164. The RECEM Valles project area is highly diverse and extremely extensive: The Valles Macro Region consists of 65 municipalities covering an area of 83,380 km2 (as a matter of comparison, this is twice the size of Switzerland). It covers an altitudinal gradient ranging from ca 800 to 3,500 meters above sea level and total population is 2,328,741. The population density in the project area is one of the lowest in the world (27 inhabitants/km2) and road infrastructure in rural areas in Bolivia are very poor as they are unpaved. These two factors have a direct impact on project costs to ensure access to beneficiaries.

165. The project will target 23,400 agroecological management + 4,448 ha agricultural lands + 17,510 ha of areas in prioritized micro-watersheds. This represents an investment of about USD 734 per hectare (USD 33.3 M GCF grant / 45,358 ha). The average costs for moderate degraded areas in Latin America is between USD 750/ha and USD 1 350/ha. Therefore, the investment per ha in this project is low compared to the highest average costs for moderate degraded areas of USD 1350/ha.

166. Conventional credit projects are defined as fiscal resources and, as such, cannot be invested in private plots of land (Law No. 1178 of Governmental Control). Since fiscal resources cannot be invested in private plots, credit cannot benefit the most vulnerable farmers. The GCF grant will support vulnerable smallholder farmers to be connected from the irrigation hydrant to their farm plot for technified access to water and to implement agroecological and agroforestry practices. This will reduce losses in the food production in areas with high vulnerability to climate change, poverty and food insecurity. The project will also invest in activities related to the enabling environment that ensures the sustainability of the investments in farmers' plots. The enabling environment among others, include: 1) addressing the barriers of the most vulnerable farmers having limited possibilities to access credit to invest in the connection between the hydrant and the plot and 2) catalyzing and leveraging more funds from financial institutions to cover the investments at farmer´s plot level.

167. Bolivia is unable to provide the significant financing it requires to successfully cover the incremental costs of adapting to climate change. Fiscal resources[114] together with substantial loans are inadequate to meet the demands for adaptation by the most vulnerable population of Bolivia: smallholder farmers living in conditions of poverty and extreme poverty in the Valles Macro-region, a highly climate vulnerable macro-ecosystem. Budgetary analyses indicate that national budgetary resources will be able to meet only a fraction of the financing required to carry out the adaptation measures required over the coming thirty years.

168. It is therefore essential that external funding support be obtained to meet the incremental costs of managing climate change risks and impacts, particularly in high priority sectors such as agriculture and in regions where substantial numbers of most vulnerable people live and work.

169. Bolivia's NDC identifies the need for climate resilience action in the areas of water resources, food security, health, human settlements and risks reduction and ecosystems. However, the country's rural development initiatives are not yet systematically addressing climate risks. With the government unable to provide the significant financing it requires to successfully cover the incremental costs of adapting to climate change, rural farmers and communities remain vulnerable to weather-related climate hazards. Fiscal resources[115] together with substantial loans are inadequate to meet the demands for adaptation by the most vulnerable population of Bolivia: smallholder farmers living in conditions of poverty and extreme poverty in the Valles Macro-region.

170. The project proposed here requests GCF incremental finance to deliver direct benefits to vulnerable smallholders in poverty and extreme poverty, in particular women and youth. These farmers are the most vulnerable to climate change as they currently depend on aging and inefficient irrigation systems as well as increasingly variable rainfall for primarily subsistence agriculture.

171. This project proposes a paradigm shift based on climate resilient agroecological and biodiverse production systems, and a participatory micro-watersheds management approach to enhance water security, revitalization and climate-proofing of

[114] Ministerio de Medio Ambiente y Agua (2017). Programa Plurianual de Gestión Integral de Recursos Hídricos y Manejo de Cuencas. Available at: https://datos.siarh.gob.bo/biblioteca/250

[115] Ministerio de Medio Ambiente y Agua (2017). Programa Plurianual de Gestión Integral de Recursos Hídricos y Manejo de Cuencas. Available at: https://datos.siarh.gob.bo/biblioteca/250

existing irrigation systems and building the capacities of smallholders to implement climate risk management through resilience-enhancing practices and use of climate and other information in readily accessible formats and languages. This project will enhance the productive and social assets of smallholders and their organizations and communities so that they not only adapt to rainfall variability and drought but also build their financial management capacities to invest in sustained maintenance of investments and continued climate-risk management. From these elements, the project will support the generation of important ground experiences on JMACC, which in itself is a paradigm shifting approach promoted by the Bolivian government from the perspective of integral wellbeing. For detailed description of the project design and rationale see section 17 in the Annex 2. Feasibility study. Moreover, the project will contribute to the implementation and provide empirical cases of the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth, and the Management Plan for Watershed Resources and Integrated Watershed Management.

172. This will synergize with MiRiego and other initiatives to ensure that vulnerable smallholder farmers overcome obstacles to water security by improving on-farm water distribution, access and use with efficient technologies and practices. GCF resources will be used to provide smallholders with the training in climate-resilient agricultural management to ensure the long-term agroecosystem functions and services, therefore, long-term productivity of their agroecosystems in the face of rainfall variability and drought. Impediments that block smallholders from accessing credit and markets will be overcome by setting up innovative financial instruments adapted to the realities of smallholders with the engagement with financing entities, complemented with training and access to market information on demand, prices and other factors. GCF financing will enable smallholders to manage climate risk more effectively through use of readily accessible climate and agricultural information. **GCF involvement is required because many of the activities to transform Bolivia's agriculture and water sector have characteristics of public goods.** For example, climate-proofing the connected irrigation infrastructure between farms suffers from the "free rider" problem —everyone benefits from the measures whether they pay for them or not. Similarly, measures to restore landscapes by protecting and reforesting woodlands generate positive externalities that are difficult for individual farmers to capture. Similarly, measures to restore landscapes by protecting and reforesting woodlands generate positive externalities that are difficult for individual farmers to capture. For other measures, **the short-term financial returns of the climate resilient investments typically are insufficient to motivate farmers to invest on their own, as indicated in Annex 3 (Economic and Financial Analysis).** Many of the resilience measures require up-front investments that only yield benefits over an extended period.
173. GCF funds will be used to catalyze public/private funding with the potential national partners, which includes private and public institutions such as Water Fund Tarija, Santa Cruz Water Fund, National Bolivian Brewery, Taquiña. The project will coordinate and facilitate the involvement of these national partners in the funding of various climate change related initiatives by promoting institutional and corporate arrangements, considering corporate social responsibility and new initiatives with the associations of the private sector: Confederation of Private Entrepreneurs of Bolivia, National Chamber of Industries and Agricultural Chamber of the East in order to achieve new investments in adaptation to climate change, with the participation of government institutions.
174. The GCF funds (US$ 33,3 M grant) will be administered by FAO (as Accredited Entity and sole Executing Entity) for the four proposed components. GCF resources will complement public funds and in-kind resources, and to motivate further development and investments in irrigation, agriculture and climate information. Both the government (central and local) and smallholder communities are unable to invest in the incremental costs of adaptation, particularly concerning meeting the threats of increasing climate variability and the pressure that this is placing on fiscal resources. By overcoming the hurdles to sufficient and reliable sources of water, vulnerable smallholders will be able to diversify production and use the revenues from sale of increased and more stable yields to re-invest in the climate resiliency of their agroecosystems. GCF funds will be used to contract third parties for the delivery of specific activities, with preference on local institutions such as MDRyT, SENAMHI, VIDECI, INSA, INIAF, BDP, PROFIN, FONDESIF, FIF and FINRURAL to ensure local capacity building and support to existing public and private platforms.
175. The co-financing from the Ministry of Environment and Water (MMAyA) will be focused on supporting sustainable and resilient agricultural management and developing activities such as: i) technical assistance for implementation of territorial planning instrument, ii) provision and implementation of management and technologies to maintain soil organic matter and moisture, that combined contribute to adaptation and mitigation to climate change, iii) support delivery of agricultural inputs. MMAyA will also co-finance: i) strengthening and implementation of water reservoirs, ii) conservation through integral management of watersheds, iii) restoration and conservation of ecosystems functions and services by developing and implementing of a strategy for adaptation to climate change focusing on integral watershed management system, iv) will prepare an updated the inventory of water sources in the valleys Macro-region, v) monitoring of ecosystem functions of restores and conserved watersheds, vi) participate in capacity building activities along the project, vii) support to the local governance processes related to the project, viii) support in the work with the private sector and financial regulatory entities, to develop access to credits and other financial mechanisms adapted to smallholders implementing climate adaptation approaches, and ix) support the design and implementation of national and sub-national regulation and policies related to climate change adaptation and mitigation.

176. MMAyA co-finance will increase the availability of funds through the projects of restoration and watershed management implemented by the beneficiaries. The GCF project will provide technical assistance to FONABOSQUE to elaborate and implement a Financial Strengthening Plan so that this institution can scale up and increment the number of beneficiaries, as well as increase their technical capacity to access other climate funds.
177. Annex 3 (Economic & Financial Analysis) provides a detailed review of the project's overall costs and benefits. Table 9 below shows the results of an economic analysis of the project using a social discount rate of 12.7%. As indicated, the short-term marketable benefits of the project are insufficient to justify investment on their own. However, when valued at a carbon price of USD 40/tonnes CO_2 the project's positive externalities during the 5-year implementation period and beyond provide an overwhelming justification for GCF investment.

Table 12. Economic analysis results

Economic results, base case *(12.67% discount rate)*	5 YEARS	10 YEARS
Project NPV, marketable benefits (USD)	- 41,634,906	- 22,009,522
Project NPV, marketable & non-marketable benefits	4,698,187	24,323,571

178. As indicated in the economic and financial analysis, the project is justified by the long-term improvements in sustainable production experienced by farmers. These benefits would be unlikely to materialize without the significant capacity building and institutional strengthening support provided via GCF support. In addition, the project is justified by the multiple values of ecosystem functions and services, which cannot be captured by private actors.
179. The project seeks the minimum level of concessionality to overcome these barriers to climate resilience. Budgetary analyses indicate that national budgetary resources will be able to meet only a fraction of the financing needed to carry out the adaptation measures required over the coming thirty years. GCF financing will be combined with co-financing from the GoB's MiRiego Programme to ensure that vulnerable smallholder farmers overcome obstacles to water security by improving water storage, off-farm distribution, and use of water efficiency technologies. GCF resources will be used to provide smallholders with basic infrastructure (i.e., on-farm climate-proofed irrigation) and training in climate-resilient agricultural management to ensure the long-term productivity of their agro-ecosystems in the face of rainfall variability and drought. Impediments that block smallholders from accessing credit and markets will be overcome with training, engagement with financing entities, and access to market information on demand, prices and other factors. GCF financing will enable smallholders to manage climate risk more effectively through use of readily accessible climate and agricultural information. This project will enhance the productive and social assets of smallholders and their organizations and communities so that they not only adapt to rainfall variability and drought but also build their financial management capacities to invest in sustained maintenance of investments and continued climate-risk management.
180. A careful analysis of the financing landscape for smallholder agriculture in Bolivia concludes that this is the most appropriate financial instrument for the initial stages of the project, with a managed transition to other financial instruments planned for the post-GCF phase. For more information on the financing landscape, see sections 4 and 16 of the Feasibility Study- Annex 2.
181. The Climate Investment Fund (CIF) proposed a green credit line for smallholder farmers in Bolivia with Inter-American Development Bank as Implementing Entity in 2011[116]. The country has microfinance institutions specialized in smallholder farmer finance such as Fond De Desarrollo Comunal (FONDECO)[117]. In 2008 FOGAL deployed guarantees for loans to farmers in Bolivia. In addition, the first crop insurance scheme in Bolivia was launched in 2011[118], and an evaluation by 3ie indicates that crop insurance is instrumental in stimulating increased farmer investments[119].
182. The pilot schemes described above reflect the types of innovative financial mechanisms that this project seeks to mainstream. However, the pilot schemes cited focus either on other regions of Bolivia such as the Altiplano Macroregion, or on high-value cash crops such as Co-Financing fee and grapes. Project beneficiaries face multiple barriers to climate resilience, and providing loans without the associated technical interventions will not yield the anticipated benefits. The small farmers in the Valles Macroregion are poorly served by those projects, and the project's main financial innovation is to work with financial intermediaries and policymakers to mainstream these financial instruments for small farmers in Valles who grow staple crops

116 https://www.climateinvestmentfunds.org/sites/cif_enc/files/140430%20Bolivia%20-%20Microfinance%20and%20climate%20resilience%20for%20smallholder%20farmers%20in%20Bolivia%20.pdf

117 http://www.fondation-farm.org/zoe/doc/farm_microfinance_conf_eng.pdf

118 https://archive.globalpolicy.org/social-and-economic-policy/world-hunger/general-analysis-on-hunger/50634-bolivias-first-crop-insurance-scheme-promises-to-empower-farmers.html%3Fitemid=id.html

119 https://www.3ieimpact.org/sites/default/files/2020-07/PE-TW13.1007-PIRWA-Bolivia.pdf

such as maize, potatoes, vegetables and tree fruit. Therefore, the project relies on grants at the outset, with the adoption of credit and insurance mechanisms as part of the long-term sustainability and replication strategy.

B.6. Exit strategy (max. 500 words, approximately 1 page)

183. The exit strategy for this project ensures that the barriers to climate resilience are overcome sustainably, so that project components and processes continue beyond the planned project implementation period. Recognizing the importance of long-term sustainability, the project has been designed from the outset to align incentives between key stakeholders, strengthen delivery capacity and promote the long-term flow of financial resources in support of project objectives. The exit and sustainability strategy includes the following mechanisms:

Financial sustainability

184. At the farmer / community level, the project creates a positive feedback loop between adoption of climate resilient agroecological management and diversified and increased incomes. The project interventions are designed to reduce climate-related crop losses, which provides a direct financial incentive for their continued use. The project supports measures that help farmers diversify their incomes beyond crop production. In addition, the project supports long-term structural improvements to farmers' market access, makes agricultural value chains more resilient, and facilitates farmers' access to credit, insurance and other financial instruments that contribute to long-term resilience against climate hazards.
185. At the national and institutional level, the project will support: 1) Development of a financial assistance plan for FONABOSQUE that will seek to further increase support FONABOSQUE is providing to GAMs and GADs through programs of restoration, watershed management and recovery of vegetation cover activities as well as leveraging future climate finance to Bolivia 2) Development of new public and private financial mechanisms (facilitate the identification of financial mechanisms to support long-term climate resilient agricultural production and irrigation systems) and 3) Provide technical assistance to INSA to develop and implement innovative insurance mechanism.
186. All these interventions are accompanied by technical assistance to the institutes, as well as raising awareness and strengthening capacities of farmers to understand how to access these instruments. These interventions will be further implemented by the respective financial institutes even after project completion, for example in the case of FONABOSQUE, to leverage climate finance to the restoration of ecosystems and agricultural landscapes at municipal level. For more information, please see section 18, Activity 4.2.1 in Annex 2. Feasibility study.

Technical sustainability

187. The ecosystem-based climate adaptation proposed by the project combines two major technical approaches (i.e., ecosystem function restoration through agro-ecological production management and integral watershed management), which constitute the core contribution of the project to technical sustainability. Ecosystem function restoration implies a long-term resilience approach for agroecosystem and watershed water cycling, moisture retention, and micro-climate regulation, as well as biomass production and soil organic matter accumulation. All of them are necessary for a complementary and self-sufficient adaptation and mitigation to climate change, as well as being in accordance with Bolivian regulations.
188. At a national level, the project will strengthen the capacities of key organizations at all levels of government, particularly those in the Ministry of the Environment and Water, and in its decentralized institutions, for the development and implementation of programs and projects providing technical and other assistance to vulnerable smallholder farmers (including women and youth). Institutional staff will develop the capacities to analyze climate vulnerability of agroecosystems and micro-watersheds and to provide substantive solutions to problems of production and sustainability that build resilience across the crop, pasture, and forested portions of mosaic landscapes. Institutions will develop capacities to ensure monitoring of adaptation efforts and progress towards climate resilience of the Valles Macro-region, in particular as they are based on hydrological regulation. Long-term programs run by MMAyA, such as the MiAgua and MiRiego, will incorporate the lessons learned from this project and thus mainstream climate resilience in their future investments. At local level, the project will train smallholder farmers and producer organizations to take climate informed decisions, and to design and implement agricultural adaptation solutions. The project overcomes the initial information barriers to climate action and adopts a model of training "promoters" (in Spanish "*promotores*"), who will then support the local agricultural extension services to reach a wider population in more isolated areas and promote the climate resilient agroecological management, technologies and management. Farmers will also receive training for the management of on-farm climate resilient irrigation systems, and will employ a "learning by doing" approach to keep this knowledge current.
189. Additionally, an O&M Plan (Annex 21) has been designed, which outlines as a requirement that the end user (the farmer) assumes the costs of O&M during and after the implementation of the project, as part of the exit strategy to guarantee its sustainability. For this purpose, and to ensure sufficient water flow, during project implementation, MiRiego, the municipalities and the Irrigation Committees will sign a commitment that endorses the O&M requirement as well as the ensured water flow

coming from the MiRiego infrastructure. This commitment must be linked to CC adaptation mechanisms and joint mitigation and adaptation mechanisms for comprehensive forest management, established by Law 300 (Law of Mother Earth).

Institutional sustainability

190. The project provides a long-term solution to the institutional and governance barriers that currently limit climate resilience in the Valles Macro-region. The project will work directly at the municipal level, mainstreaming climate change in the Integral Territorial Development Plans (PTDI) as a territorial planning instrument, and ensuring that adaptation actions are included. Likewise, the participation of the Ministry of Planning in the design and implementation of investments in the country will make it possible to plan for additional funding to continue the pursuit of this project's long-term objectives.
191. Additionally, the Economic and Social Development Plan - 2021 - 2025 (2021-2025 PDES) will soon be formulated. This will be a window of opportunity for FAO with the RECEM-Valles project to support and enhance the process by providing baseline information and influencing the formulation of goals and actions, ensuring that climate change adaptation is mainstreamed into this strategy document. The integration of the project results in the PTDI and the PDES will provide enabling conditions for the upscaling and sustainability of the project components.
192. Moreover, FAO has been invited by the MMAyA and the MDRyT to support in the formulation of their annual programs. This presents an excellent opportunity to further mainstream the Project components in those institutions and their lines of work.
193. The technical and institutional experiences, lessons, and data generated by the project will provide solid empirical evidence and examples of pathways of implementation of the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth. This will be useful in implementing national climate-related policies, such as strategic national (e.g., the future 2021–2025 PDES) and territorial planning instruments (e.g., PTDIs).
194. At the local level, the proposal has been designed through a participatory process involving all stakeholders, including autonomous territorial entities (municipal governments, departmental governments, indigenous and native people's government districts and governments, farmers, and intercultural communities) and local communities and beneficiaries. This ensure that the actions proposed in the Project are socially viable, building stakeholder ownership from the very beginning of the process. Likewise, the project contemplates effective local inclusion and participation in governance and decision-making during project implementation, through full recognition of the rights of women, men, and youth living in poverty-stricken rural areas. The project implementation will also be supported by the existing governance mechanisms recognized by the Plurinational State of Bolivia, including the coordination and consultation territorial platforms for the social management of water, productive development, and integral management of watersheds.
195. The project will capitalize on existing governance structures and initiatives at the local and national levels enhance governance models for the management of water resources. In particular, the project will create coordination and consultation territorial platforms and agro climatic platforms to strengthen multi-stakeholder governance and enhance climate resilience (Output 4.3). Bolivia has a long history in using territorial platforms as governance models especially for natural resource management. The municipalities, ensuring their continued use and ability to promote project components over the long term, will institutionalize the created platforms under the RECEM-Valles project.

Scale-up and replication

196. The process of scaling up the project's components and lessons learnt will contribute to replicate the initiative in other macro regions of the country. Based on this, it is foreseen that the MPD will include the replication of the project in the new 2021-2025 PDES, which sets the basis for national economic planning and public investment. In the project completion process, the broad participation of different actors and national counterpart institutions will be taken into account, in order to gradually carry out the exit process, to guarantee the sustainability of the actions. The lessons learnt and best practices obtained during the project implementation will be inputs to the process of public policy development. This process will be supported by the project in coordination with national and sub-national authorities, in order to generate the formulation of policies and the awareness of national authorities for their institutionalization and implementation. Finally, the Project includes activities with local institutions and communities on learning and knowledge management to capture and disseminate lessons learnt and to support knowledge and skill co-construction to promote institutional strengthening of local organizations**. Replication will be achieved via:**

    - Through FFS (continued capacity building)
    - Enterprises/cooperation (continued support to markets and value chains)
    - The other financial mechanisms, such as with INSA and BDP, to be out scaled to other regions and farmers

197. To provide for the leveraging of additional and new funds from other sources by FONABOSQUE, the project proposes the following activities:

    - Build capacities of FONABOSQUE to increase its possibilities to access other climate-related funding, helping the fund being incrementally capitalized. Activity 4.2.1 refers to fostering collaboration between domestic funders such as FONABOSQUE and financial institutions. Regarding the interest of the government to enhance FONABOSQUE´s capabilities, efforts to develop organizational and operational capacities will be part of the activities of the GCF project

as it is also expected to accredit FONABOSQUE to international financing entities such as the Green Climate Fund, the GEF, among others.

- FONABOSQUE works with GAMs and GADs through programs of restoration, watershed management and recovery of the vegetation cover activities. Once the projects are awarded, the awarded party has to submit a co-financing of 20%, which constitutes new leverages. This 20% of co-financing funds allocated by GAMS and GADs, ensure the ownership, implementation and sustainability of the investments.

198. The GCF project will also support FONABOSOQUE to elaborate a financial assistance plan with participation of the private sector and the banking sector; to evaluate and then strength their technical capacities (landscape approach, watershed management, environmental services, etc.); to identify a map of actors to better perform in the context of climate change that helps to define and implement a FONABOSQUE Institutional Strengthening Plan. These actions will allow the institution to manage new climate-related funding (Joint Forest Mechanism, etc.).

C. FINANCING INFORMATION

C.1. Total financing

(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)	Total amount	Currency
	33.30	million USD ($)

GCF financial instrument	Amount	Tenor	Grace period	Pricing
(i) Senior loans	Enter amount	Enter years	Enter years	Enter %
(ii) Subordinated loans	Enter amount	Enter years	Enter years	Enter %
(iii) Equity	Enter amount			Enter % equity return
(iv) Guarantees	Enter amount	Enter years		
(v) Reimbursable grants	Enter amount			
(vi) Grants	33.30			
(vii) Results-based payments	Enter amount			

(b) Co-financing information	Total amount	Currency
	30.00	million USD ($)

Name of institution	Financial instrument	Amount	Currency	Tenor & grace	Pricing	Seniority
MMAyA	In kind	29.5	million USD ($)	Enter years Enter years	Enter%	Options
FAM	In-kind	0.50	million USD ($)	Enter years Enter years	Enter%	Options
Click here to enter text.	Options	Enter amount	Options	Enter years Enter years	Enter%	Options
Click here to enter text.	Options	Enter amount	Options	Enter years Enter years	Enter%	Options

(c) Total financing (c) = (a)+(b)	Amount	Currency
	63.30	million USD ($)

(d) Other financing arrangements and contributions (max. 250 words, approximately 0.5 page)	*Please explain if any of the financing parties including the AE would benefit from any type of guarantee (e.g. sovereign guarantee, MIGA guarantee).* *Please also explain other contributions such as in-kind contributions including tax exemptions and contributions of assets.* *Please also include parallel financing associated with this project or programme (refer to the co-financing policy).*

C.2. Financing by component

Please provide an estimate of the total cost per component and output as outlined in section B.3. above and disaggregate by source of financing. More than one co-financing institution can fund a single component or output. Provide the summarised cost estimates in the table below and the detailed budget plan as annex 4.

Component	Output	Indicative cost million USD ($)	GCF financing		Co-financing		
			Amount million USD ($)	Financial Instrument	Amount million USD ($)	Financial Instrument	Name of Institutions
Component 1.	Output 1.1	11,312,532	11,312,532	Grant	0	-	-
	Output 1.2	4,307,098	4,307,098	Grant	0	-	-
Component 2.	Output 2.1	25,697,161	5,197,161	Grant	20,500,000	In-kind	MMAyA
	Output 2.2	3,032,571	1,832,571	Grant	1,200,000	In-kind	MMAyA/FAM
Component 3.	Output 3.1	10,447,992	3,848,000	Grant	6,599,992	In-kind	MMAyA
	Output 3.2	506,489	506,489	Grant	0	-	-
Component 4	Output 4.1	280,050	280,050	Grant	0	-	-
	Output 4.2	1,839,999	1,839,999	Grant	0	-	-
	Output 4.3	1,891,000	1,591,000	Grant	300,000	In-kind	FAM
M&E		1,032,001	1,032,001	1,032,001	0	-	-
Project Management (PMC)		2,953,107	1,553,099	1,553,099	1,400,008	In-kind	MMAyA
Indicative total cost (USD)		63,300,000		33,300,000			30,000,000

199. Please see Annex 4 – Detailed Budget Annex for details of the cost allocation. The Plurinational State of Bolivia through the Ministry of Environment and Water (MMAyA) and the Federations of Municipalities (FAM) will allocate resources for co-financing the project implementation, showing its commitment to support actions that will foster climate-resilient agriculture in the Bolivian Valleys Macro-region. This co-financing will be distributed as follows: USD 21,700,000 for the implementation of on-farm climate-proofing management systems (Component 2); USD 6,599,992 for the conservation of watersheds, restoration and conservation of ecosystems functions and services activities (Component 3); and USD 300,000, to strengthening institutional capacities to support climate risk management (Component 4). The Project Management Cost contribution of USD 1,400,008 will be co-financed by MMAyA. Altogether, the expected co-financing for the project equals USD 30,000,000.

See annex 4 for more information and allocation of requested GCF funding per cost category

C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)

C.3.1 Does GCF funding finance capacity building activities?	Yes ☒ No ☐
C.3.2. Does GCF funding finance technology development/transfer?	Yes ☒ No ☐

200. GCF resources will be invested in building capacity for climate-resilient, integrated solutions for landscape restoration, water resource management, agricultural systems and food security. The project promotes institutional planning and coordination across government officials and communities to overcome the sectoral and non-coordinated approach to agriculture that had been adopted in the past. The project aims to enhance organizational capacity of farmers to plan for and implement resilient local agricultural and water management solutions, adopt technologies and systems for climate-resilient agricultural production, ensuring their financial and human resource viability post-project.

201. At the institutional level, the project strengthens the capacity of key institutions to deliver climate resilience solutions for farmers. This capacity building is critical to long term sustainability, as it empowers Bolivian institutions to identify, develop, and deliver climate adaptation support to farmers beyond the project implementation phase.

D. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

This section refers to the performance of the project/programme against the investment criteria as set out in the GCF's Initial Investment Framework.

D.1. Impact potential (max. 500 words, approximately 1 page)

202. The project builds on best practices and lessons learned from past adaptation-focused interventions in Bolivia that have had a transformative impact on enhancing the resilience of smallholder farmers to climate change. These interventions have focused on restoring ecosystem functions and services at on-farm and micro-watershed level, improving crop productivity, enhancing water resource management practices amidst the threat of recurrent drought and other climate events (e.g. hail and frost), managing competition for depletion and pressure on scarce natural resources, and building capacities of rural communities against the adverse effect of climate change on food and water security and sustainable livelihoods. These approaches will impact on ecological but also social resilience, which is a major underlying goal of the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth. From this perspective, learning will have an impact beyond the Valles macro-region, inside and outside the national boundaries.

203. **Direct beneficiaries:** The beneficiaries are smallholder subsistence farmers with up to 2 ha farmland[120]. They are anticipated to participate in training, climate-proofed of irrigation systems, and other project activities. As a result of the project, the direct beneficiaries will have improved water security for rain fed and on-farm climate-proofed irrigated agricultural production, reducing the impact of climate change-related rainfall variability and drought. The distribution of project activities across the directly benefitting households considers that some beneficiaries will be associated with predominantly crop production management (e.g. agroecological practices) while other beneficiaries will be incorporated into enhanced water resource management strategies (e.g., climate-proofed irrigation system). In total, the project will **directly benefit over 81,551 head of households[121]** in the Valles Macro-region (0.7% of the national population) including 2,800 indigenous people. The total number of direct beneficiaries combines the direct beneficiaries across the 65 municipalities under the four project components. In all of the municipalities that are part of the project's intervention area, the female population predominates.

204. **Indirect beneficiaries:** Additionally,1,251,769 people[122] (10.7% of the national population, 48% women, and 52% men) will benefit indirectly from improved micro-watershed ecosystem functions and services, and strengthened institutional support. Factors influencing the extent of this dynamic were assumed as the spatial proximity of the target municipalities, socioeconomic circumstances, and networking potential.

205. The project has been designed to contribute to three of the GCF's adaptation results areas:

206. GCF adaptation results area 1 (A1) – Increased resilience of vulnerable people, communities and regions: The project will increase the resilience of 81,551 vulnerable people in the Valles Macro-region in Bolivia against drought events and land degradation by addressing technical production management aspects (e.g., agroecological management), implementing climate-proofing technologies (e.g., irrigation, solar tents, thermal blankets, anti-hail nets), timely weather and climate information, and access to markets and innovative financial instruments, mobilized by participatory governance. The synergies among these approaches will contribute to foster sustainable livelihoods and with that, replicability and sustainability. Of this total, an estimated 29,000 people (50% of the direct beneficiaries) are adult women, who tend to be more vulnerable than men.

207. GCF adaptation results area 2 (A2) – Increased resilience of health and well-being, and food and water security: The project will contribute to food and water security by encouraging resilient agroecological management that reduce climate change related crop losses, by diversifying incomes, and by encouraging improved water management. The project works in an area where households already are facing water insecurity; the project will maintain or increase the numbers of food secure households in the project area despite climate impacts. Actions to increase access to safe water supply will ensure that 81,551 head of households will be water secure in the face of drought.

208. GCF adaptation results area 4 (A4) – Increased resilience of ecosystem and ecosystem functions and services: The project will contribute to improving ecosystems and ecosystem functions (e.g., hydrological regulation, nutrient cycling, weather

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120 Types of land tenure rights include: (a) **The solar campesino, or residential plot**, which may not be subdivided or mortgaged but can under certain conditions be sold. An owner of the solar campesino does not pay land tax on it. (b) **Small properties** that provide the owner and family with a livelihood and thus ensure their economic survival. These holdings, too, cannot be subdivided or mortgaged, but – again like the residential plot – may be sold under certain conditions, and are not subject to land tax. (c) **Community properties**, which are collectively titled to the corporate unit for subsistence purposes. They cannot be sold, mortgaged or subdivided, nor do the owners have to pay land tax on such holdings. (d)**Tierras comunitarias de origin**, which are the habitat of indigenous peoples (¼ the original inhabitants) and communities, where they live according to their own forms of economic, social and cultural organization.

121 The description on how this number was determined, is described in the Feasibility Study, 5.2 Project location and beneficiaries 5.2.1 "Criteria for the prioritization of the project area and beneficiaries" (page 79 – 83).

122 See annex 4 of the Feasibility study with the methodology used for the calculation of direct and indirect beneficiaries.

regulation) and services (fertile soils, water provision) by promoting restoration and conservation activities, and appropriate basin-scale management measures. Therefore, the project will help community members manage ecosystem functions and services on a watershed level. The project will conserve and restore 17,510 ha of areas in prioritized micro-watersheds, outside of protected areas, as well as 1.3 million ha of areas of forests and forestlands will be under conservation or restoration.

D.2. Paradigm shift potential (max. 500 words, approximately 1 page)

209. The proposed project aims at changing the current paradigm of conventional and ecosystem deteriorating agriculture, to a paradigm based on transformative production systems that while it adapts to climate change also restores ecosystems to further enhance social-ecological resilience expressed in biodiverse climate-resilient agriculture and climate-proofing irrigation. This transition involves adapting and mainstreaming innovative financial mechanisms piloted in other contexts in Bolivia for use by financial intermediaries that can support smallholders in the Valles Macroregion. The project will, with financial assistance from the GCF, address these additional risks and raise the adaptive capacity of rural communities, rendering them less vulnerable to climatically induced food and water insecurity.

Paradigm shift

210. The paradigm shift comes in part from the permanent transition from traditional agricultural practices characterized by high climate change vulnerability and increasing loss and damage, to a system where farmers know how to employ more resilient practices, are able to access credit and insurance products that make long-term investments financially viable, and are able to diversify their incomes and access markets for their crops. By permanently overcoming the technical, institutional, capacity and financing barriers to climate resilience, the project will create a virtuous circle and lead to a paradigm shift in climate resilient production for vulnerable poor farmers.

211. The project delivers the following **paradigm-shifting pathways**:
    - Promoting resilient agroecology – (1) integrated agricultural development planning that mitigates the risks of maladaptation and maximizes joint adaptation-mitigation synergies and co-benefits; (2) enabling community-responsive policies, frameworks and practices.
    - Reconfiguring food systems – (3) identifying key leverage points for catalyzing high-impact adaptation & mitigation in sustainably productive food systems; (4) strengthening policy coherence and cross-institutional coordination.

212. Smallholder farmers are experiencing numerous challenges and often are locked in a vicious cycle of poverty and climate vulnerability. The production and consumption decisions of small-scale farmers are highly interdependent, as the risks and challenges they face in their income-generating activities affect their consumption decisions. As a result, most vulnerable households often adopt “low-risk, low-return” livelihood strategies, reducing their future income-earning potential, trapping them in a cycle of poverty and further increasing their vulnerability to future risks. The GCF investment will enable farmers and create supportive conditions to overcome this cycle through a set of interdisciplinary, complementary, and mutually reinforcing interventions. The project will enhance the productive and social assets of smallholders and their organizations and communities so that they not only adapt to rainfall variability and drought but also build their financial management capacities to invest in sustained maintenance of these assets and continued climate-risk management. The project strengthens the critical role of social protection in food security and rural livelihoods protection. The proposed project approach is based on FAO experience in multiple contexts, based on:

- equipping households with the resources needed to overcome liquidity constraints and cope with market failures, shocks or stresses, thus allow them to invest in their livelihood activities and enable better decision-making and management of risks where insurance and financial markets are not sufficiently available; (Component 1)
- stimulating local economic development with positive feedback loops on poverty reduction (Component 1);
- supporting sustainable management of natural resources to strengthen resilient livelihoods (Component 3).
- Supporting access to financial mechanisms for farmers to sustain adaptation measures in agriculture (Component 4)

Potential for scaling up and replication

213. The RECEM – Valles approach has been designed to foster scaling-up and replication of the proposed adaptation measures. First, the project design is based on lessons learned and best practices from previous ecosystem-based climate adaptation projects in Bolivia, with interventions that reflect the needs, constraints, resources and capabilities of beneficiary farmers and their communities. Second, the project builds upon proven financial mechanisms that have been employed elsewhere in Bolivia and supports policy makers and public and private financial intermediaries to adapt and mainstream these innovative financial mechanisms for small farmers in the Valles Macroregion. In addition, the project adopts a social-ecological approach to reducing climate risk and vulnerability that focuses on both social (i.e. biodiverse production and diets) and economic dimensions (i.e. enhanced productivity and income generation linked to agro-ecosystem restoration). These three approaches create a virtuous circle that overcomes the barriers to climate resilience described in Section B. above, and lay the groundwork

for long-term project sustainability, scaling-up and replication without further grant funding, in the Valles Macroregion and other areas of the country.

Potential for knowledge sharing and learning

214. The RECEM – Valles project has high potential for knowledge generation, sharing and learning due to several factors. First, stakeholder engagement and network building as a central feature of the project. Real-time results from the project will be disseminated within and beyond the intervention zones through several existing information sharing networks and forums as well as FFS and producers' associations. Second, the project will identify and participate, as relevant and appropriate, in policy-making processes and/or any other networks and events, that foster broader climate adaptation at community in the country and region. Third, the project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. This will involve an active process of integrating successful adaptation actions within development planning. Over the mid- to long-term, effective incorporation of knowledge and experiences, success stories, lesson learned, technical and institutional capacities, etc. will help to reduce vulnerability and build local resilience.

Contribution to the creation of an enabling environment

215. The RECEM – Valles project contributes directly to the creation of an enabling environment through a step-wise approach. First, the project targets institutional capacity strengthening at the state level. Specifically, the project invests in improved technical capacity and knowledge of government agencies on to implement policies and norms for the climate-resilient production of food under irrigation systems, integral watershed management, and monitoring of ecosystem functions and services. The focus on training of extension workers to support new water harvesting systems enables viable community development models and sustained ownership of the local communities in long-term water security. Second, the project targets capacity strengthening at the local level. Specifically, the project will train and strengthen the organization of communities for local governance of production systems and climate-proofed irrigation. The focus on water management systems will enable viable community governance models to continue operations and maintenance by local communities of water harvesting infrastructure beyond the project lifetime. Third, the project will foster ***innovative financial mechanisms adapted to smallholders***. Part of the integral perspective of the project is the promotion and active coordination with the public and private sector to develop and implement innovative financial instruments and mechanisms to support and secure climate-resilient agriculture, including an agricultural insurance. In Bolivia most smallholder farmers do not protect their investments in productive activities through either conventional indemnity-based agricultural insurance or innovative index-based insurance products due to the lack of an adequate insurance product meeting their needs. The project will put efforts to also identify mechanisms that enable public/private financial contributions (such as fee reductions) to reduce premium costs. Specific details will be defined through an analysis within the coordination and consultation territorial platforms along the project implementation, to identify public and private partners during the micro insurance product design phase, with the aim towards long-term financial sustainability and scalability.

Contribution to the regulatory framework and policies

216. The Bolivian legal framework has established the sustainable "management of life systems" as one of the instruments of public policy to guide the development path to Living-Well, defined in the Law 071 on Rights to Mother Earth, and Law 300 on Framework of Mother Earth and Integral Development to Living-Well. This approach is based on the recognition and respect of the rights of the peoples and of Mother Earth, with the mutual fulfillment of duties and obligations between the State and society. Within the framework of interactions among rights, obligations and duties, the aim is to build a life system based on integral landscape management, where ecosystem functions are preserved or restored, and implementation of resilient and sustainable production systems contribute to the integral welfare. Moreover, the Law 300 establishes the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth. Although this view and regulation (i.e. Law 071 and Law 300) is not new in the Bolivian context, at a global scale is still quite innovative and requires efforts to its implementation to generate learning and lessons for its effective implementation nationally, with relevance internationally. The project will contribute to the implementation of the Joint Mitigation and Adaptation Mechanism to the Integral and Sustainable Management of Forests and Mother Earth, about which the concrete experience, is still incipient. The rehabilitated function of hydrological regulation will also allow the implementation of other activities, like on-farm irrigation, as a part of a climate resilient approach in production systems.

Contribution to post-COVID-19 recovery

217. The full effects and severity of the COVID-19 crisis in Bolivia are not yet known. The crisis has immediate short-term effects on livelihoods and food security and will deeply affect society and the country's economic systems in the post-pandemic phase of recovery. The project will contribute to COVID-19 recovery by strengthening local livelihoods and their food security through three levels of effects. (i) At farm level with low-carbon and climate-adapted production systems that involve restoration of the production base (i.e. soils) with reduced need of external inputs (whose access depends on currently restricted long-distance

transportation) thanks to the effects of biodiversity in enhancing ecosystem functions e.g. soil fertility, regulation of pest populations, and soil water retention, among others, which will be further improved with the water availability from the on-farm climate-proofing irrigation. The benefits related to the biodiverse production systems to be fostered by the project will contribute, at the same time, in income diversification and security. (ii) At community level, the institutional strengthening and aggregate commercialization promoted by the project will support socio-economic resilience. (iii) At watershed level, the overall restitution of ecosystem functions and services implies a long-term recovery, but also long-term buffer capacity and resilience to social-ecological shocks at landscape scale with positive impacts at the two other levels (farm and community).

Overall contribution to climate-resilient development pathways

218. The project is closely aligned with sustainable land management and water governance at the state level in Bolivia. In addition, there are several anticipated co-benefits from project activities that are associated with environmental, demographic, and gender-based national development priorities. The design of the project is intended to avoid maladaptation, in terms of the appropriateness of the interventions, the avoidance or minimization of negative externalities, and the avoidance of negative overall climate-related impacts. The results of a GHG analysis using the Ex-ACT tool indicate net GHG emission reductions of -377,497 tCO_2e over a 20-year period.

219. Finally, the project will support the implementation of the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth, which embraces broad objectives for the welfare of the components of Mother Earth and life systems, including those of human communities.

D.3. Sustainable development (max. 500 words, approximately 1 page)

220. The project fosters an ecosystem-based adaptation to climate change by promoting biodiverse and climate-resilient agriculture as well as integral restoration, conservation, and management of watershed. Both approaches having environmental and climate mitigation as co-benefit. This triggers the contributions to the following national priorities and goals.

221. The project contributes directly to the results of the Economic and Social Development Plan of the Plurinational State of Bolivia. The results of this Plan are linked to 13 pillars, of which the project will support: Pillar 1. Eradication of extreme poverty; Pillar 6. Productive sovereignty with diversification; Pillar 8. Food sovereignty and Pillar 9. Environmental sovereignty with integral development.

222. Moreover, the project will contribute to the implementation of the Plurinational Political and Strategy for the Integral and Sustainable Management of Biodiversity and Action Plan 2019 – 2030, regarding Strategic Objective (SO-2) on institutionality and territorial governance; SO-3 on use, conservation and sustainable use of biodiversity; SO-5 on knowledge management and dissemination, and transversal SO on climate change, and development and inclusion of the gender approach.

223. Additionally, the project will contribute to the fulfillment of the following Sustainable Development Goals (SDG): SDG1. *End of poverty* (Target 1.1, Target 1.4, Target 1.5); ODS 2. *Zero Hunger* (Target 2.1, Target 2.3, Target 2.4, Target 2.5); SDG 5. *Gender equality* (Target 5.5, Target 5.a); SDG 6. *Clean water and sanitation* (Target 6.4, Target 6.6); SDG 8. *Decent work and economic growth* (Target 8.2, Target 8.3, Target 8.6, Target 8.9); SDG 13. *Climate action* Target 13.2); SDG 15. *The life of terrestrial ecosystems* (Target 15.1, Target 15.2, Target 15.3, Target 15.4, Target 15.9).

Environmental and Mitigation co-benefits

224. An evaluation was conducted using the Ex-Ante Carbon Balance Tool (EX-ACT) to evaluate the impacts of project interventions on greenhouse gas (GHG) emissions. The evaluation assessed emissions compared to the business as usual scenario for all relevant project activities.

225. Co-benefit 1. Enhanced CO_2 sequestration, capture and storage potential due to avoided deforestation and increased soil carbon: The detailed results obtained with EX-ACT can de disaggregated by components each reflecting a different activity. The component regarding Activities 1.1.2, 1.2.1, and 2.2.1 appears in the Cropland module, in section annuals. Given the computation of data (detailed in Computation of data in EX-ACT – see Appendix 6 to Annex 2 Feasibility Study), the total carbon balance over 20 years of this activity is equal to -162,944 tCO2-eq. This result is the net difference between the GHG emissions from the baseline scenario (237,032 tCO2-eq) and the emissions of the "with project" scenario (74,089 tCO2-eq). The introduction of conservation agriculture practices (reduced tillage), and residue management are the main improvements; irrigation and manure application are considered too. The project foresees the implementation of activities that are net emitters, such as the construction of rainwater harvesting reservoirs, irrigation systems, collection and marketing centers, and promotion of honey value chain. The analysis included an exploration of the potential for methane emissions (CH_4) from water storage reservoirs, however the relatively small size of these features and limited residence time of the water and organic matter yields negligible methane emissions. The sum of this activities produces 768,929 tCO2-eq over a 20 years period. Finally, activity 3.1.2 aims for the restoration and conservation of watersheds to sustain and regulate the hydrological cycle. This component gives the highest potential carbon sink as: -996,119 tCO2-eq over 20 years. Overall, results show a positive environmental impact due to the implementation of the project's activities, quantified at a total carbon balance of -377,497

tCO2-eq over 20 years. Knowing the total area under focus, this would amount to a carbon balance of -0.6 tCO2-eq per hectare and per year.

Table 13- Results of Ex-ACT GHG balance

Component	***Emissions***	
Cropland	-162,943	
Forest Management	-996,119	
Inputs & Investments	768,929	
Inland Wetlands	411.92	
Refrigerant leakage	10,335	
Honey value chain	1,1890	
Total carbon balance	**-377,497**	**tCO2-eq over 20 years**

Social, Economic and Gender co-benefits

226. **Co-benefit 2. Improved inclusion of young women and men in agricultural sector and reduced rural-urban migration:** The project was developed in close consultation with women, men and youth, and is designed to maximize participation and inclusion. The improved resilience and financial attractiveness of the agricultural systems will attract youth and thus reduce the trend of rural-urban migration and improved

D.4. Needs of recipient (max. 500 words, approximately 1 page)

Vulnerability of the country and/or specific vulnerable groups, including gender aspects

227. Bolivia was ranked as one of the most vulnerable countries, among the top 10 countries globally, on the 2018 Global Long-Term Climate Risk Index published by German Watch.[123] Climate change projections show that the project's implementation areas are expected to be the significantly affected areas in the country, where vulnerable farmers are at the greatest risk of being pushed into conditions of extreme food insecurity due to climate change. The effects of climate change include reduced precipitation, leading to decreased water availability and therefore decreased agriculture productivity levels. Land is primarily used for agriculture, due to the lack of conservation practices and poor soil management, majority of land in the project area is degraded with high levels of soil erosion. Such management practices and loss of forest cover reduce the landscape's capacity to regulate the hydrological cycles.

228. A free prior informed consent was obtained through a workshop-driven process led by FILAC (Indigenous Fund for Latin America and the Caribbean). At least five sites of municipal commonwealth connection and interconnections of the Valles Macro-region were the venue for seven sessions of consultation and discussion of the project. These workshops concluded with the signature of the participants, confirming the need of the implementation of the actions proposed by the project.

Economic and social development level of the country and the affected population

229. Over the last few years, Bolivia has made great progress in the reduction of poverty, jointly with climate change adaptation and mitigation initiatives, reinforcing the resiliency of rural communities and production systems. The country promoted an economic development model that reduced poverty (between 2005 and 2015) from 59.6% to 38.6%, and extreme poverty from 36.7% to 16.8% in the same period[124]. At the same time, the government is setting up national programmes such as "MiAgua" (for drinking water and sanitation), MiRiego (for irrigation), and a National Forestry and Restoration Programme, which involve public resources, guided by the Economic and Social Development Plan, for fostering joint adaptation and mitigation, water resource management, restoration, and restoration of degraded lands.

[123] David Eckstein, Vera Künzel and Laura Schäfer. (2017). Global Climate Risk Index 2018. Available at: https://germanwatch.org/sites/germanwatch.org/files/publication/20432.pdf

[124] INE (2019). La Pobreza en Bolivia se ha reducido. Available at: http://www.ine.gob.bo/index.php/notas-de-prensa-y-monitoreo/item/429-pobreza-en-bolivia-disminuyo-en-21-puntos-porcentuales

230. Despite the progress made by the country in providing infrastructure for irrigation, agriculture and climate change, efforts and investment are insufficient given the high exposure and low response capacity at local level. Of the total population corresponding to the project area, 63% are in poverty and of this group, 47% suffer from moderate poverty, and 16% from extreme poverty. This highly vulnerable population can easily face dire consequences if their livelihood deteriorates.

Absence of alternative sources of financing

231. The GCF's involvement in this project is essential, given Bolivia's strained economic circumstances and the transformation the fund offers by potentially triggering further investments. Currently, domestic budgets for building resilience among smallholder farmers and introducing resilient management practices are not near the levels required. The Government of Bolivia is in a state of debt distress as shown in the most recent World Bank debt sustainability assessment, Bolivia is facing economic limitations to reduce the account deficit of the balance of payments, bank deductions on foreign transfers and the high degree of debt maturity (Bolivian Government debt to GDP is currently 69.4 %)[125], all of which mean a great tension in economic management. Therefore, there is limited financial ability to increase climate proofing investments and any ongoing efforts to help smallholder farmers cope with recurrent drought. GCF financial support will ensure that the limited co-financing provided by the GoB will be leveraged to maximum advantage.

Need for strengthening institutions and implementation capacity

232. Institutional and implementation capacities to address some of the urgent adaptation needs have been strengthened by recent initiatives in Bolivia as they relate to food security and climate change issues. Nevertheless, there remains an urgent need in Bolivia for improving the link between adaptation and national policymaking in particular for integral water management, as well as for policies to be supportive of cooperation and participation in ecosystem restoration activities that account for the special needs of small-scale farming communities in rural areas. However, there remains a general weakness of capacity in areas including strategic development planning and local governance. This underscores the critical importance of further mobilizing institutional capacity to address effective pro-poor and pro-adaptation expenditures at local levels of government through the implementation of targeted responsive adaptation interventions, including gender-responsive.

D.5. Country ownership (max. 500 words, approximately 1 page)

233. Bolivia has not yet published a GCF Country Programme. However, the RECEM-Valles project is fully aligned with national priorities identified in Bolivia´s Third National Communication, National Adaptation Plan and in its NDC to 2030 and in the Land Degradation Neutrality Strategy (water, soil and irrigation management as a measure of adaptation to climate change). Particularly, the project will contribute to reach the following targets as defined in the country´s NDC: 20 million hectares with ecosystem functions preserved and restored; zero illegal deforestation; 4.5 million forested and reforested hectares; and at least one million hectares under irrigation system producing food. Moreover, the project will contribute to the national indexes on sustainable forests and on water adaptation capacity. The RECEM Valles proposal has been formulated in close consultation/participation of the NDA (Ministry of Planning), the MMAyA, the FAM and other key stakeholders, and will be articulated as part of the pipeline in the country programme.

234. The NDCs note that agricultural production with the participation of smallholders and communities makes an important contribution to climate change adaptation[126] and to the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth. The following climate-related priorities are supported by the proposed project:

- Development of resilient infrastructure for the production and service sector.
- Restoration of vegetation cover (trees, grasslands, wetlands and others) to prevent erosion and reduce damage due to adverse climatic events.
- Increase in irrigated area through revitalized irrigation systems, irrigation technology, irrigation dams, water harvesting, and multipurpose water reuse projects.
- Strengthening community management, union and local capacities for adaptation to climate change, including community irrigation management and collective management of water services.
- Implementation of ancestral practices and knowledge, in the context of integrated water management.
- Risk management actions to mitigate common threats of the risks of drought and flooding.
- Broader use of water harvesting technologies, conservation of soil moisture and use of water more efficiently.
- Increased the surface of forested and reforested areas to 4.5 million hectares by 2030.
- Increased forest areas with integrated and sustainable community management approaches with 16.9 million hectares in 2030, in reference to 3.1 million hectares by 2010.

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[125] International Monetary Fund. Bolivia. 2020. https://www.imf.org/en/Countries/BOL

[126] *Intended Nationally Determined Contribution from the Plurinational State of Bolivia https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Bolivia%20(Plurinational%20State%20of)%20First/INDC-Bolivia-english.pdf*

- Strengthened environmental functions (carbon capture and storage, organic matter and soil fertility, biodiversity conservation and water availability) in about 29 million hectares by 2030.
- Reducing extreme poverty to zero in the population dependent on forests by 2030, based on approximately 350 thousand people by 2010.
- Increase net forest cover more than 54 million hectares by 2030, compared to the 52.5 million of 2010

235. This project has been prepared together with the Government of Bolivia in response to the needs of the population that is the most vulnerable to climate change. Participatory design and implementation, which involves consultation with three ministries and the subsequent use of public consultation platforms during project preparation to identify and prioritize activities, will ensure that the project responds to multiple environmental, social, economic, and climate-related issues from a comprehensive stakeholder perspective, and that the actions proposed in the project are socially viable, ensuring that the central and local governments and beneficiaries take ownership of the project from the outset. This approach favors local inclusion and participation, as well as the reinforcement of existing governance mechanisms, at the municipal districts, government districts, and central government level.
236. The project will consider the best sustainable agroecological management and the ecosystems restoration and conservation, that have been implemented in the Valles Macro-region and other successful experiences developed in the Andean countries. The implementation arrangements of the project emphasize coordination with ongoing and planned Government of Bolivia programs to avoid duplication of effort and reduce transaction costs. For this to be done, a Project Steering Committee (PSC) and a Technical Committee (TC) will be established that include a central role for entities of the national Government of Bolivia to ensure the coordination and development of jointly and complementary actions to maximize the efficient use of the resources. This proposed implementation arrangement includes the two mentioned committees and the Project Management Unit (PMU) that will assure a participatory governance to facilitate the implementation of the project.
237. Since 2006, the government has implemented fundamental changes in the political system and the public administration of the Plurinational State of Bolivia. Important reforms have been implemented in the main political and social structures, as well as major legislative reforms and regulations governing diverse sectors. In its efforts to reduce social, economic, environmental and institutional vulnerabilities faced in Bolivia because of climate change, new policies have been developed as part of the response of the State to the changing context in which the availability of water, food security, and forest resources are increasingly threatened.
238. The Political Constitution of the Plurinational State (CPE) of Bolivia establishes constitutional principles and general policies related to management for risk reduction and climate change. The CPE provides the overarching principles for the following reforms: The Organizational Structure of the Executive Power of the Plurinational State (DS No 29894), the Framework Law on Autonomy and Decentralization (Law No. 031), The Framework Law for Mother Earth and Integral Development for Living Well (Law No. 300), and their respective regulations. Policies and plans governing the water and forestry sectors are presented below.
239. Law No. 071 recognizes the rights of Mother Earth, presenting the necessary conditions for the regeneration of life and the Law No. 300 of Mother Earth and Integrated Development for Living Well defines the complementarity and interdependence between the rights of Mother Earth, the rights of the Bolivian people to integral development, the rights of indigenous people and peasant communities, and the rights of Bolivian society to live without material, social, and spiritual poverty. The reforms also establish the Plurinational Authority of Mother Earth to implement actions for the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth. Law No. 602 relating to risk management makes provisions for the incorporation of climate change in risk management strategies to contribute to increase resilience and reduce vulnerabilities by central government and the autonomous territorial entities. Law No. 777 establishes the Integrated State Planning System (SPIE, according to its name in Spanish), providing for the incorporation of the management of systems of life in public administration, within the framework of simultaneous and complementary consideration of the rights of members of society and Mother Earth, to achieve the goals of sustainable production, eradication of extreme poverty, and protection and conservation of the ecosystem functions.
240. The Plurinational Political and Strategy for the Integral and Sustainable Management of Biodiversity and Action Plan 2019 – 2030, was approved in 2019 as the instrument that guides the management of biodiversity under the principles harmony with Mother Earth and Living-Well, and the relevant normative instruments (i.e. CPE, Law No. 300, Law No. 777, and PDES). This Strategy provides the lines of actions and goals to 2020, 2025 and 2030 for different objectives, having as crosscutting one related to climate change and other to development and inclusion of gender perspective.
241. The project proposed here contributes directly to the above regulatory framework. Execution of project activities will be carried out through ongoing Government programs, consistent with the existing legal and institutional framework.

Capacity of Accredited Entity or Executing Entities to deliver

242. The FAO Bolivia country office was established in 1978. A long history of collaboration between Bolivia and FAO has resulted in 341 projects executed in the nine departments of the country. FAO bases its work on extensive consultation processes and carries out its actions in close collaboration with the Government of Bolivia, civil society and international cooperation, empowering social actors and local communities to be protagonists of their own development.

243. The FAO as the Accredited Entity and sole Executing Entity will ensure overall fiduciary management, ensuring that these services using GCF resources will adhere to international standards and good practices. FAO Bolivia is authorized to perform all financial, administrative, and managerial processes for the execution of projects funded by different donors.
244. MMAyA and FAM will serve as executing entities of their own co-financing. As described in Section B.4 above, each executing partner is charged with providing co-financing and delivering project activities funded from the co-financing resources aligned with their institutional mandate, procedures and technical / institutional capacity.

D.6. Efficiency and effectiveness (max`. 500 words, approximately 1 page)

245. The total Project cost is USD 63,3 million, comprising USD 30 million of co-financing and USD 33,3 million of GCF funding in the form of grants. This corresponds to a co-financing ratio of 0.9:1.
246. GCF grant support will provide the minimum concessional funding necessary to make the project viable. GCF support will address several market needs including food security, and the need for small-scale farmers to access information, knowledge, and technology to address the challenges of climate change. At present, public resources are insufficient to achieve meaningful reductions in climate change vulnerability, to improve resilience of beneficiary farmers and to reach the NDC goals.

Efficiency and effectiveness of the proposed project

247. Please see Annex 3 – Economic and Financial Analysis for a detailed description of the methodology for evaluating the project's cost and benefits. The incremental economic benefit from the project's agriculture interventions comes from a cost-benefit analysis, which considers the increase in production in climate resilient agricultural systems, comparing the situation with and without project. It considers the same methodology and assumptions that are specified in the financial analysis, but with the difference that the full costs of project implementation are included, as are societal benefits that might not be captured by individual farmers.
248. These costs include GCF investment and co-finance from partners and Government during the project period as presented in Annex 4 (Detailed Budget Description).
249. Project benefits include the cumulative net financial benefits for participating farmers compared to business-as-usual.
250. The net present value (NPV) of the project-level investment is calculated using a discount rate of 12.67% as mandated by the Government of Bolivia. The sensitivity analysis is performed using alternative discount rates of ranging from 5% to 20%
251. The project return varies depending on the period of analysis. The figures below present the NPV and Economic Internal Rate of Return (EIRR) for the 5-year implementation period, and for an estimated 10-year investment lifetime.
252. The cost-benefit analysis spreadsheet (Annex 3) presents these calculations in detail, with the results summarized below:

Table 13. Economic results, marketable benefits only

Economic results, base case	5 YEARS	10 YEARS
Project EIRR, marketable benefits	cannot calculate	-2%
Project NPV, marketable benefits	- 41,634,906	- 22,009,522

253. As indicated in Table 13, the project's discounted net present value is negative over the 5-year and 10-year implementation periods when only marketable benefits (those that can be captured directly by private actors) are included..
254. The results of the economic analysis show that the project does not generate sufficient financial returns over the five-year implementation period to be undertaken without GCF funding. At the same time, the project generates robust economic benefits over the longer term, and especially from a societal perspective, contributes to the long-term sustainability of rapidly deteriorating forests in Bolivia, and supports the GCF's goal of low-carbon and climate resilient integral development.
255. The total value of carbon sequestration / emission reductions over these activities is presented below:

Table 14. Combined value of non-marketable benefits

Non-Marketable Project Benefits	5-YEAR TOTAL	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Component 3 – Wetlands	3,200,075	781,440	703,296	632,966	569,670	512,703

Component 3 - Forest management	60,337,108	12,149,760	12,108,450	12,067,282	12,026,253	11,985,364
Component 3 – Restoration	624,240	66,320	139,480	139,480	139,480	139,480
Total Non-Marketable Benefits, USD	**64,161,423**	**12,997,520**	**12,951,226**	**12,839,728**	**12,735,403**	**12,637,546**

Table 15 - Economic returns including marketable and ecosystem benefits

Economic results, base case	5 YEARS	10 YEARS
Project EIRR, marketable & non-marketable benefits	34%	56%
Project NPV, marketable & non-marketable benefits	4,698,187	24,323,571

256. The positive externalities (non-marketable benefits) make the project extremely desirable over all timeframes. These positive externalities take the form of public goods and demonstrate the importance of GCF investment.
257. The results of the financial analysis show clearly that the project activities would not be undertaken by farmers without GCF support, despite the significant positive externalities and public goods generated by this initiative. A sensitivity analysis for each intervention is included in the Annex 3 narrative document examining the impact on NPV from a range of discount rates between 5% and 20%, and from a 10% and 25% reduction in net cash flows (either due to increased input prices or reduced sales revenues). Increasing the hurdle rate and reducing cash flows both reduce NPV; however, the activities remain profitable across all of these scenarios.
258. The financial analysis estimates the increase in net incremental income over the baseline (business as usual) scenario as a result of investments in adaptation packages to transform agricultural systems and increase resilience to climate change by smallholder farmers. Net incremental income is calculated as the difference between the input costs for agricultural activities and the resulting revenues.
259. Both costs and benefits are estimated considering market prices of inputs and outputs. The financial analysis includes the following assumptions:
260. Financial discount rate of 13.5% without project (Government mandated micro-credit lending rate)
261. Evaluation horizon of 5 years (period of GCF funding) and 10 years (minimum estimated lifetime of agroforestry and other agricultural investments)
262. The financial analysis reviews the costs and benefits, seen from the farmer's perspective of investments in climate resilient activities. Specifically, the financial analysis examines the following interventions:

Table 16. Summary of activities evaluated quantitatively

Activity	**Indicator**
Design, construction and management of solar tents for vegetable production.	At least 1,200 solar tents for growing vegetables have been implemented with the participation of at least 30% women and 10% young people.
Provision and implementation of anti-hail nets.	At least 600 anti-hail nets have been installed to protect fruit crops in municipalities under a high risk of hail.
Provision and implementation of thermal blankets to deal with frost.	At least 1,000 thermal blankets have been implemented in vegetable crops in municipalities under a high and very high risk of frost.

Provision and implementation of technologies to maintain soil moisture, such as hydrogel in fruit trees in areas with high vulnerability to droughts	At least 5,200 smallholder farmers (30% women and 10% young) have incorporated the hydrogel in their fruit plantations in municipalities under a high and very high risk of drought.
Implementation of agroecological agriculture practices, conservation agriculture and management of agroforestry systems.	At least 500 hectares are implementing agroecological agriculture by small farmers and communities are trained.[127], [128]
	At least 1000 hectares of conservation agriculture practices[129] are implemented (30% women and 10% young farmers beneficiaries) and receive training in conservation agriculture.
	At least 500 hectares with SAFs have been implemented by small farmers, women farmers and communities.
Promote and strengthen agroecological production according to national and international standards and guidelines.	Organic and/or agroecological certification processes[130] are managed by at least 120 producer associations (at least 40 of them led by women) who have received agroecological and organic production training.
Technical support and implementation of collection and marketing centers for agroecological products.	At least 2 collection centers implemented.
Identification and financing of agricultural activities and productive diversification of high socioeconomic, cultural and environmental value according to the prioritized region (beekeeping, among others) (*)	At least 20 associations of honey producers[131] at the local level and three regional associations have been strengthened in production and marketing processes.
Strengthen and implement water reservoirs to optimize water harvesting activities linked to resilient irrigation systems.	1,000 community reservoirs and 5,000 family water tanks have been implemented in municipalities under high and very high risk of drought.

[127] Altieri, M. A., Nicholls, C. I., Henao, A., & Lana, M. A. (2015). Agroecology and the design of climate change-resilient farming systems. *Agronomy for Sustainable Development*, *35*, 869–890.

[128] Vázquez-Moreno, L. L. (2021). Resiliencia de sistemas de producción agropecuaria expuestos al huracán Irma en Cuba. *Pastos y Forrajes*, *44*, 1–15.

[129] Based on FAO and the definition provided on “Conservation Agriculture” practices are those that “promote minimum soil disturbance (i.e. no tillage), maintenance of a permanent soil cover, and diversification of plant species. It enhances biodiversity and natural biological processes above and below the ground surface, which contribute to increased water and nutrient use efficiency and to improved and sustained crop production.” Available at: https://www.fao.org/conservation-agriculture/en/

[130] To ensure that the certification will be kept by the smallholder project participants, the scheme to be adopted is the participatory guarantee systems (PGS) in accordance with Law No. 3525 and its regulatory procedures, which will allow the use of the national seal for “ecologic” and “in transition to ecologic” produce. The following are the key PGS characteristics that will contribute to its retention by project participants: (a) the local and social organization and strengthening that it is based on, (b) its collective nature in implementation, (c) the possibility of sharing expenses because it is primarily applicable to producer's associations and communities, and (d) the motivation and trust that generate the recognition of the ecological / transition identity. It will be promoted that producers' associations and communities pay for the PGS, which is feasible because the price (approximately USD 700/five years) set by SENASAG (the tuition entity under Law No. 3525) generally implies a minimal (if any) increase in the cost per unit of marketed product, because the cost is divided among: (i) the families members of the association or community to apply for the PGS, and (ii) the volume of all registered products produced collectively, over the five years of validity of the PGS.

[131] Honey production is included in the project’s productive diversification due to its socioeconomic, cultural, and environmental value. Furthermore, the Bolivian Food Company (EBA) has a consistent demand for honey for inclusion in various types of food subsidies. EBA operates and supports honey producers' marketing in the country's various macro-regions.

Implement and revitalize technified and resilient irrigation systems, differentiating seasonal and perennial crops.	At least 4,448 hectares with technified and resilient irrigation systems have been revitalized and / or implemented.

263. Where applicable, the NPV and IRR are calculated (1) assuming business-as-usual, (2) assuming the project investments are made directly by farmers without external support, (3) assuming a highly concessional loan at 0.8% interest and a 5 year tenor, and (4) assuming GCF support and co-financing. Note that scenario (2) is considered highly unlikely, in that the project will provide considerable capacity building and support to strengthen the enabling environment. Scenario (2) assumes farmers will spontaneously overcome the information, capacity, policy and coordination barriers that hinder climate action. Furthermore, it assumes that farmers will find the means to implement these measures independently when there is no evidence of this happening in reality. The estimated financial returns in Scenario (2) therefore represent the most extreme optimistic case of what is possible without GCF support. Scenario (3) is included for the sake of completeness, but is considered inappropriate in the current context. Even though loans may appear cost-efficient from a top-down perspective, this analysis ignores loan administration costs and the implementation delays that would be incurred. Furthermore, a loan scheme may discourage the most vulnerable farmers from participating in the project.
264. The financial analysis for each output is calculated from the private perspective. The financial analysis uses both IRR and NPV as metrics of relative profitability. However, IRR calculations in Excel require negative cashflows in Year 1, and these are not always applicable in a rural farming context. For example, farmers may make an initial investment at the beginning of the planting season, and then recoup that investment in that same year when they harvest and sell their crops. Please see Annex 3 – Economic and Financial Analysis for a detailed presentation of the calculations and results. Note that IRR is calculated based on annual cash flows, where an investment in one year is recouped in subsequent years. Where farmers recoup investments in the same year it may not be possible to calculate IRR for the period of analysis.

Solar tents / greenhouses

265. The up-front costs of tomato production with artisanal greenhouses / solar tents make this investment uneconomic without GCF support over the 5-year project period, as the implied IRR is considerably lower than the presented discount rate. Over 10 years the intervention remains unattractive compared to BAU. IRR cannot be calculated for the BAU scenario because financial returns remain positive throughout the period of analysis. A 5-year loan at 0.8% spreads out the costs of the intervention but does not address the poor cash flow situation over the GCF implementation period. On the other hand, GCF grant support covers the up-front costs of the investment, making the climate resilience measure financially viable over all periods. The greater returns as a result of GCF support, demonstrate the incremental benefit of project investment.

224.

Anti-hail nets

266. Under the BAU scenario peach production is highly profitable in good years, but with the risk of significant losses due to hail. Without project support, the use of anti-hail nets reduces peach production losses due to hail damage, but the high up-front investment reduces NPV and makes the measure unattractive compared to BAU. The need to pay interest on the GCF loan further reduces financial attractiveness from the farmer perspective. GCF grant support reduces the up-front investment cost and results in much higher financial NPV.

Thermal blankets

267. The analysis assumes minor frosts affecting pea output in years 3 and 6, and early severe frosts every 10 years. In reality the timing of moderate and severe frosts is unpredictable. In the absence of GCF support and in the loan scenario, the NPV of the thermal blankets intervention is negative – the recurring investment costs outweigh the increase in yields. GCF grant support helps farmers overcome these financial barrier barriers during the project period, resulting in positive NPV over the 5- and 10-year periods of analysis.

Hydrogel

268. The use of hydrogels and other soil moisture retaining measures for peach production provides attractive returns to farmers. These measures reduce labor costs for irrigation during dry periods and simultaneously help to improve yields during these periods. Without this intervention farmers face highly variable revenues and increased risk of losses. However, the analysis shows that up-front costs mean NPV is lower than BAU without GCF support, and as noted earlier, the without-GCF

counterfactual scenario ignores the need for outreach, technical assistance and capacity building to deliver these interventions. Partial (80%) GCF support improves NPV and makes the intervention more financially attractive to farmers. A greater grant contribution (90%) or more would further incentivize adoption in the near term by making the NPV higher than the BAU.

Organic agriculture and certification of production processes

269. Organic production systems are expected to increase and stabilize yields that are threatened by climate change, while certification will result in higher prices per kilogram. The production and certification of organic tomatoes yields positive returns compared in both the GCF scenario and the no-GCF counterfactual, than in the loan scenario. However, the without-GCF counterfactual scenario ignores the need for outreach, technical assistance, and capacity building to deliver these interventions. A greater grant contribution (90% or more) would further incentivize adoption in the near term by making the NPV higher than BAU. .

Sustainable agroforestry

270. Sustainable agroforestry is a long-term investment for farmers. Returns are negative over the 5-year period of analysis with both loans and grants. They remain marginal in the loan scenario over a 10-year period but are more strongly positive with GCF grant support, improving over even longer (20-year) periods of analysis. The concessional loan scenario does not smooth cashflows sufficiently to make this intervention attractive to farmers. A greater grant contribution (90% or more) would further incentivize adoption in the near term by making the NPV higher than BAU.

Conservation agriculture

271. The implementation of conservation agriculture yields negative returns compared to BAU over 5 years in the without-GCF loan and grant scenarios. The relatively high initial investments / opportunity costs are rewarded by greatly increased revenues in future years, especially as climate-related temperature and precipitation changes affect yields under BAU. GCF grant funding provides incremental support that makes NPV more attractive than BAU in both the short and longer term.
272. Expanded beekeeping and honey production (apiculture) requires significant upfront investments that outweigh future gains and make 5-year NPV unattractive compared to business as usual, in the absence of GCF grant investment. GCF support reduces these up-front costs, shortens the payback period compared to BAU and makes this intervention much more attractive to farmers.

Water harvesting

273. In the absence of water harvesting investments, farmers face decreased yields and increased labor costs during drought periods. Water harvesting investments are expected to increase yields and decrease labor costs, resulting in higher net cash flows over time. However, the up-front costs of these investments make them unattractive in the short term without GCF grant support – NPV is considerably lower than BAU over 5 years and only marginally better over 10 years. Loans are significantly less attractive over both periods. GCF grant support reduces these up-front costs and makes this intervention much more attractive to farmers over both timeframes.

Resilient on-farm irrigation

274. The upfront costs of resilient technified on-farm irrigation systems result in an extended payback period that makes these investments unattractive without GCF support – even taking into account the reduced long-term yields that are expected as a result of climate change. NPV without GCF investment is lower than BAU over the 5-year and 10-year periods of analysis, and even lower in the concessional loan scenario. GCF grant support reduces these up-front costs, shortens payback periods and makes this intervention much more attractive to farmers.
275. In conclusion, the economic and financial analysis shows that the project yields significant short term and long-term financial benefits for farmers because of increased resilience, and positive societal/ environmental externalities that justify public investment.
276. While the proposed interventions appear highly profitable to farmers, the multiple interlocking barriers described in Section B. above impede their spontaneous adoption. At the project's initial stages grant financing is required due to the need to put farmers immediately on a path to climate resilience, even while the project supports financial intermediaries to develop and tailor innovative financial mechanisms for the circumstances of local farmers in the Valles Macro region. Long-run financial sustainability is based on mainstreaming green credit and insurance products for small farmers who adopt climate resilient practices, in parallel with adoption of improved practices, income diversification and market access. As noted in the 3ie report on agricultural insurance in Bolivia, access to insurance over multiple years led to increased farmer expenditure and willingness to borrow for agricultural inputs, and increased yields[132]. The virtuous circle created by reduced climate-related

[132] https://www.3ieimpact.org/sites/default/files/2020-07/PE-TW13.1007-PIRWA-Bolivia.pdf

crop losses and increased profitability, income diversification, and improved access to credit and insurance products means that the project will be able to generate ongoing financial benefits for farmers without the need for continued grant financing.

E. LOGICAL FRAMEWORK

*This section refers to the project/programme's logical framework in accordance with the **GCF's Integrated Results Management Framework** to which the project/programme contributes as a whole, including in respect of any co-financing.*

E.1. Project/Programme Focus

Please indicate whether this proposal is for a mitigation or adaptation project/programme. For cross-cutting proposals, select both.

☐ Reduced emissions (mitigation)

☒ Increased resilience (adaptation)

E.2. GCF Impact level: Paradigm shift potential (max 600 words, approximately 1-2 pages)

This section of the logical framework is meant to help a project/programme monitor and assess how it contributes to the paradigm shift described in section D.2 above by applying three assessment dimensions - scale, replicability, and sustainability.

Accordingly, for each assessment dimension (see the definition per assessment in the accompanying guidance note), describe the current state (baseline) and the potential scenario (target) and rate the current state (baseline) by using the three-point-scale rating (low, medium, and high) provided in the guidance note. Also describe how the project/programme will contribute to that shift/ transformation under respective assessment dimensions (scale, replicability and sustainability). In doing so, please refer to section B.2(a) (theory of change).

Assessment Dimension	Current state (baseline)		Potential target scenario (Description)	How the project/programme will contribute (Description)
	Description	Rating		
Scale	At present, effective and long-term adaptation planning is constrained by weak local governance structures, inadequate approach to natural resource management (e.g. water resources and forests) and limited financial mechanisms tailored to effectively support smallholder farmers in the adoption of	Low	Local and national governance structures are strengthened and able to plan and implement long-term adaptation strategies, which aim to reduce the vulnerability of smallholder farmers to climate impacts. This will be complemented by tailored climate risk-informed financial mechanism and products, which will allow smallholder farmers to effectively adopt climate resilient agricultural practices.	The project adopts a multi-level approach to empower both local and national institutions to effectively integrate climate adaptation interventions across agricultural systems and integral watershed management. Capacity strengthening of local stakeholders (including smallholders, public officers, local CSOs, relevant academia) are planned to increase their knowledge base on climate resilient agriculture, climate-proofed irrigation, and watershed management for climate adaptation and resilience. This will allow these local stakeholders, through their participation on multi-stakeholder platforms for watershed management, to improve planning instruments to include climate change risks.

	climate resilient-agricultural practices.			Financial mechanisms will for example include strengthening capacity of FONABOSQUE and develop a plan to leverage new climate-related funds and scale up and increase the number of beneficiaries
Replicability	Smallholder farmers are experiencing numerous challenges and often are locked in vicious cycle of poverty and climate vulnerability. As a result, most vulnerable households often practice conventional agricultural practices and adopt "low-risk, low-return" livelihood strategies, reducing their future income-earning potential, trapping them in a cycle of poverty and further increasing their vulnerability to future risks. Smallholder farmers and extension services lack knowledge and experience with climate resilient agricultural practices and experience significant impacts on their production. Access to water for irrigation is inadequate especially for farmers in remote areas, where irrigation systems do not reach	Low	Lessons learned and best practices from the implementation of the resilient agriculture practices and enhanced on-farm climate-proofed irrigation systems are replicated in other regions in Bolivia. It is foreseen that the MPD will include the replication of the project in the new 2021-2025 PDES, which sets the basis for national economic planning and public investment.	Replication will be achieved via: • Through the Implementation of climate resilient technologies such as solar tents, hail nets and thermal blankets and restoration practices, which are based on best practices from other regions in Bolivia, this project will be able to document best practices from the Macro region that can be replicated in other regions, and perhaps even in other countries. • Through Farmer Field Schools, community promoters will continue capacity building to other regions of the country as well • Increased market access, especially on the support of the apiculture sector, will be replicated to other apiculture associations in the country • The other financial mechanisms, such as with INSA and BDP, to be replicated to other regions and farmers as well, given the national scope of the services that both INSA and BDP offer.

Sustainability	Smallholder farmers tend to have little or no access to formal credit, which limits their capacity to invest in the technologies and inputs they need to plan for anticipatory action to increase their resilience to climate change and reduce food insecurity and poverty. Financial institutions interested in serving this market face a myriad of risks and challenges associated with agricultural production and lending, including seasonality and the associated irregular cash flows; higher transaction costs; and systemic risks, such as floods, droughts, and plant diseases. Financial service providers (i.e., banks, microfinance institutions, and insurance companies) are thus discouraged from lending to farmers. Moreover, farmers have had trouble entering markets, have poor access to agricultural technologies, and lack critical agricultural/livestock advisory and extension services. in agricultural production, farmers face challenges in accessing	Low	At the farmer / community level, the project creates a positive feedback loop between adoption of climate resilient agroecological management and diversified and increased incomes. The project interventions are designed to reduce climate-related crop losses, which provides a direct financial incentive for their continued use. In addition, the project supports long-term structural improvements to farmers' market access and makes agricultural value chains more resilient. Finally, the project supports measures that help farmers diversify their incomes beyond crop production. At the national and institutional level, the project identifies complementary financial mechanisms and supports development of innovative financial instruments (e.g. MFI, parametric insurance) that enable the implementation of climate-proofed irrigation and ecosystems restoration investments beyond the project period, and supports farmers to access these instruments. Taken together, these project activities provide a sustainable solution to the technical and financial barriers to on-farm climate resilience.	The project seeks to scale up the investments made under MiRiego by supporting integral and participatory watershed management in the highly vulnerable Macro region, using a climate-resilient approach that enables sustainability in the provision of ecosystems functions and services. Addressing water scarcity by climate proofing irrigation, enhancing watershed ecosystem functions and services, and applying an ecosystem-based approach is in line with the Bolivian PDES and will contribute to the Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth and JMAM.

	and participating in markets under stable and fair conditions.			

E.3. GCF Outcome level: Reduced emissions and increased resilience (IRMF core indicators 1-4, quantitative indicators)

GCF Result Area	IRMF Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
Total number of direct and indirect beneficiaries	Core indicator 2: Direct and indirect beneficiaries reached, disaggregated by gender[133]	National Household Survey[134] Information and monitoring system for territorial planning, economic and social development.	Total = 0 Males = 0 Females = 0	Direct Total = 34,000 Male = 17,680 Female = 16,320 Indirect Total = 500,708 Male = 260,368 Female = 240,340	Direct Total = 81,551 Male = 42,407 Female = 39,144 Indirect Total = 1,251,769 Male = 659,920 Female = 600,849	The detailed information of beneficiary calculation methodologies can be found in Annex 4 - Feasibility study.
ARA1 Most vulnerable people and communities	Core indicator 2: Direct and indirect beneficiaries	National Household Survey[136] Information and monitoring system for territorial	Total = 0 Males = 0 Females = 0	Direct Total = 34,000 Male = 17,680	Direct Total = 81,551 Male = 42,407 Female = 39,144	By increasing technical assistance and options to access to financial support, and demonstration of successful, climate-resilient, production systems,

[133] Detailed methodology for estimating the direct and indirect beneficiaries is included in Annex 4 of the FS

[134] The National Household Survey (Encuesta de Hogar) is conducted every 2 to 3 years and the last one has been in 2019. It presents a complete picture of the living conditions of the Bolivian population at a household level. For more information: http://anda.ine.gob.bo/index.php/catalog/84

[136] The National Household Survey (Encuesta de Hogar) is conducted every 2 to 3 years and the last one has been in 2019. It presents a complete picture of the living conditions of the Bolivian population at a household level. For more information: http://anda.ine.gob.bo/index.php/catalog/84

	reached, disaggregated by gender[135]	planning, economic and social development.		Female = 16,320 Indirect Total = 500,708 Male = 260,368 Female = 240,340	Indirect Total = 1,251,769 Male = 650,920 Female = 600,849	smallholders will adopt sustainable agricultural and watershed management practices and increase their climate and social-ecological resilience. The same number of beneficiaries will apply to both core indicator 2 and supplementary indicator 2.4 The detailed information of beneficiary calculation methodologies can be found in Annex 4 - Feasibility study.
ARA2 Health, well-being, food and water security	Core indicator 2: Direct and indirect beneficiaries reached, disaggregated by gender	National Household Survey Information and monitoring system for territorial planning, economic and social development.	Total = 0 Males = 0 Females = 0	Direct Total = 34,000 Male = 17,680 Female = 16,320 Indirect Total = 472,446 Male = 245,672 Female = 226,774	Direct Total = 81,551 Male = 42,407 Female = 37,144 Indirect Total = 1,251,769 Male = 650,920 Female = 600,849	The baseline survey will be conducted at project start. "Water security" for household/residential use is defined as "access to safe, sufficient and affordable water to meet basic needs for drinking, sanitation and hygiene, to safeguard health and well-being, and to fulfil basic human rights" (UN Water). The detailed information of beneficiary calculation methodologies can be found in Annex 4 - Feasibility study.
ARA4 Ecosystems and ecosystem services	Core indicator 2: Direct and indirect beneficiaries reached, dissagregated by gender	National Household Survey Information and monitoring system for territorial planning, economic and social development.	Total = 0 Males = 0 Females = 0	Direct Total = 34,000 Male = 17,680 Female = 16,320 Indirect	Direct Total = 81,551 Male = 42,407 Female = 39,144 Indirect	

[135] Detailed methodology for estimating the direct and indirect beneficiaries is included in Annex 4 of the FS

				Total = 500,708 Male = 260,368 Female = 240,340	Total = 1,251,769 Male = 650,920 Female = 600,849	
ARA1 Most vulnerable people and communities	Supplementary 2.1: Beneficiaries adopting improved and/or new climate-resilient livelihood options, disaggregated by gender	National Household Survey[137] Farm surveys	Total = 0 Males = 0 Females = 0	Direct Total = 11,400 Male = 5,928 Female = 5,472 Indirect Total = 437,044 Male = 227,263 Female = 209,781	Direct Total = 28,498 Male = 14,819 Female = 13,679 Indirect Total = 1,092,609 Male = 568,157 Female = 524,452	The detailed information of beneficiary calculation methodologies can be found in Annex 4 - Feasibility study. The indirect beneficiaries correspond to the members of the household (average: 4 members) that are not the head of household (accounted as direct beneficiaries).
ARA2 Health, well-being, food and water security	Supplementary 2.2: Beneficiaries (female/male) with improved food security.	National Household Survey Information and monitoring system for territorial planning, economic and social development.	Total = 0 Males = 0 Females = 0	Direct Total = 11,400 Male = 5,928 Female = 5,472 Indirect Total = 437,044 Male = 227,263 Female = 209,781	Direct Total = 28,498 Male = 14,819 Female = 13,679 Indirect Total = 1,092,609 Male = 568,157	By increasing technical assistance and options to access to financial support, and demonstration of successful, climate-resilient, production systems, smallholders will adopt sustainable agricultural and watershed management practices and increase their climate and social-ecological resilience. The indirect beneficiaries correspond to the members of

[137] The National Household Survey (Encuesta de Hogar) is conducted every 2 to 3 years and the last one has been in 2019. It presents a complete picture of the living conditions of the Bolivian population at a household level. For more information: http://anda.ine.gob.bo/index.php/catalog/84

					Female = 524,452	the household (average: 4 members) that are not the head of household (accounted as direct beneficiaries).
ARA2 Health, well-being, food and water security	Supplementary 2.3: Beneficiaries with more climate resilient water security, disaggregated by gender	National Index of Water Vulnerability [138] Information and monitoring system for territorial planning, economic and social development.	Total = 0 Male = 0 Female = 0 [139]	Direct Total = 32,621 Male: 16,963 Female: 15,658 Indirect Total = 472,446 Male: 245,672 Female: 226,774	Direct Total = 81,551 Male: 42,407 Female: 39,144 Indirect Total = 1,181,116 Male: 614,180 Female: 566,936	The baseline survey will be conducted at project start. "Water security" for household/residential use is defined as "access to safe, sufficient and affordable water to meet basic needs for drinking, sanitation and hygiene, to safeguard health and well-being, and to fulfil basic human rights" (UN Water).
ARA1 Most vulnerable people and communities	Supplementary indicator 2.4: Beneficiaries covered by new or improved early warning systems, disaggregated by gender	Information and monitoring system for territorial planning, economic and social development.	Total = 0 Males = 0 Females = 0	Direct Total = 34,000 Male = 17,680 Female = 16,320 Indirect Total = 500,708 Male = 260,368	Direct Total = 81,551 Male = 42,407 Female = 39,144 Indirect Total = 1,251,769 Male = 650,920	The detailed information of beneficiary calculation methodologies can be found in Annex 4 - Feasibility study. The indirect beneficiaries correspond to the members of the household (average: 4 members) that are not the head of household (accounted as direct beneficiaries).

[138] NDC of Bolivia: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Bolivia%20(Plurinational%20State%20of)%20First/INDC-Bolivia-english.pdf1,

[139] A baseline value for the number of food secure households in participating municipalities will be set through the baseline survey to be administered during the first year of project implementation.

				Female = 240,340	Female = 600,849	
ARA4 Ecosystems and ecosystem services	Core indicator 4: Hectares of natural resource areas brought under improved low emission and/or climate resilient management practices':	NDC indicator of Index of Sustainable Forest Life[140] Farm surveys Field inspections	0 ha[141] of areas in prioritized micro-watersheds, outside of protected areas, are subject to active conservation or restoration	6,000 ha	17,510 ha	Governance conditions in selected target sites are favourable for conservation and restoration activities
	Supplementary 4.1: Hectares of terrestrial forest, terrestrial non-forest, freshwater and coastal marine areas brought under restoration and/or improved ecosystems	Field inspections	0 ha[142] of areas in prioritized micro-watersheds, outside of protected areas, are subject to active conservation or restoration	6,000 ha	17,510 ha	

E.4. GCF Outcome level: Enabling environment (IRMF core indicators 5-8 as applicable)

[140] The NDC of Bolivia makes references to: Joint mitigation and adaptation capacity has increased in areas covered by forests, agricultural and forestry systems from 0.35 units in 2010 to 0.78 in 2030, as measured by the Index of Sustainable Forest Life, achieving productivity and conservation systems that are both complementary and resilient. At the start of the implementation, it will need to be confirmed if this indicator can be used or complement for measuring progress for this result area. INDC Bolivia: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Bolivia%20(Plurinational%20State%20of)%20First/INDC-Bolivia-english.pdf

[141] These baseline figures are estimates. FAO will verify these baseline figures using data from the baseline survey to be administered during the first year of project implementation.

[142] These baseline figures are estimates. FAO will verify these baseline figures using data from the baseline survey to be administered during the first year of project implementation.

Core Indicator	Baseline context (description)	Rating for current state (baseline)	Target scenario (description)	How the project will contribute	Coverage
Core Indicator 5: Degree to which GCF investments contribute to strengthening institutional and regulatory frameworks for low emission climate-resilient development pathways in a country-driven manner	At present, effective and long-term adaptation planning is constrained by weak local governance structures, inadequate approach to natural resource management (e.g. water resources and forests) and limited financial mechanisms tailored to effectively support smallholder farmers in the adoption of climate resilient-agricultural practices. At present, local institutions have significant limitations to implement public policies and adequately integrate gender equality or youth inclusion in relevant programs for climate adaptation and watershed management. There is a lack of integral and participatory micro-watershed management plans to guide climate-resilient watershed ecosystem restoration and conservation practices.	medium	Local and national governance structures are strengthened and able to plan and implement climate resilient strategies (Mitigation and Adaptation Approach), which aim to reduce the vulnerability of smallholder farmers to climate impacts. This will be complemented by tailored climate risk-informed financial mechanism and products, which will allow smallholder farmers to effectively adopt climate resilient agricultural practices.	GCF investment will result in strengthened institutional capacity, inter-agency coordination and climate-responsive planning and development. In particular, institutional technical capacity and knowledge of national government agencies to generate and understand climate information, implement policies and norms for climate-resilient production of food under irrigation systems, integral watershed management is enhanced. Particularly, the National Service for Meteorology and Hydrology (SENAMHI) and the Ministry of Rural Development and Lands (MDRyT) will improve their capacities for information and data generation and dissemination (*Outputs 4.1 and 4.3*). GCF investments will also result in creating a coordination and consultative territorial platforms (to facilitate	National level (one country)

				climate change adaptation mainstreaming into the participatory design of norms, policies and strategies) and agroclimatic platforms (to implement early warning systems for agricultural risks), in accordance with the Comprehensive Management Plan for Watershed Resources and Integrated Watershed Management (*Output 4.1*)	
Core indicator 8: Degree to which GCF investments contribute to effective knowledge generation and learning processes, and use of good practices, methodologies and standards	The farmers lack the technical knowledge to implement climate resilient practices related to irrigation and water efficient use. There is no up to date inventory of the irrigation systems nor of the water resources in the intervention area, which prevents the government institutions to effectively manage the natural resources on which the agricultural production depends upon. In general, there is a lack of planning instruments at micro-watershed level to guide local decision-makers in integral watershed management adopting a climate resilient approach. This often results in	low	The Farmer Field Schools have improved knowledge and teaching methodologies to realize the dissemination of technical knowledge to farmers as part of the project, and beyond. Government institutions will have available an inventory of water sources in municipalities and water balances in water basins, providing for informed decision making based on climate-responsive planning processes at local level, focused on conservation, access and use of water resources. The institutions and farmers are equipped with water use plans, including strengthen capacities that	GCF investment will result in enhanced capacities of organization of communities for local governance of production systems and climate-proofed irrigation (output 2.2). The focus on water management systems will enable viable community governance models to continue operations and maintenance by local communities of water harvesting infrastructure beyond the project lifetime (*Output 3.2)* Overall, the project investment will contribute to the systematic evaluation of damages and losses due to natural disasters in agriculture in the Valleys Macro-region will be facilitated through	Single sub-national area within a country

	unsustainable land and water use in the watersheds. In a context of decreasing water availability due to climate change in the prioritised areas of the project, the lack of water and land-use management plans will exacerbate water scarcity problems and agricultural impacts.		will allow local producers to engage in responsible water use from source to consumption, leading to . diversified agricultural production systems and thus support the resilience of agroecosystems.	the development of common methodologies; the capacities to collect, store and analyse data to enable evaluation, monitoring and knowledge management of lessons learned through the implementation of the project, will also be strengthened.	

E.5. Project/programme specific indicators (project components and outputs)

*This section should list out project/programme-specific performance indicators (components and outputs) that are not covered in sections above (E.1-E.4). List down tailored indicators to monitor /track progress against relevant project/programme results (components/outputs). AEs have the freedom to decide against which components they would like to set project/programme specific indicators. If any co-benefits are identified in sections B.2(a)(b), and D.3, AEs are encouraged to add and monitor co-benefit indicators under the "**Project/programme co-benefit indicators**" section in table below. Add rows as needed.*

Please number each component and output as shown below to indicate association of outputs to the contributing component. The numbering for outputs under this section should correspond to the output numbering in annex 4 (detailed budget plan).

Project/programme results (components/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	
Outcome 1. Strengthened food and income security in changing climate through climate resilient agricultural systems	Agricultural productivity, measured in potato crop yield per hectare	Farm surveys Field inspections	5.7 t/ha (potato crop)	7 t/ha (potato crop)	11 t/ha (potato crop)	The product selected as an indicator of productivity is potato crop, as it is the second most important product in the area and it has a determining role in the diet of producer families.
	Area of farming	Farm surveys Field inspections	0	10,000 ha	23,400 ha	Training and awareness raising activities lead to the changes in behavior needed

***Output 1.1**. Climate resilient agriculture implemented and managed by smallholders for increasing the productivity and sustainability of their agroecosystems*	systems where climate-resilient agroecological management and management have been adopted				Measures include greenhouses, anti-hail nets, thermal blankets, hydrogel and other soil moisture retention practices, agroecological practice, conservation agriculture, agroforestry, and other measures supported by the project.	to favor the update of climate resilient agroecological management. Demonstration of climate resilient agroecological management result in increased yields that provide an incentive to farmers to adopt said practices.
***Output 1.2.** Increased market access of climate resilient agricultural products*	Number of farmers (male/female) members of developed operational community and associative productive enterprises.	Farm surveys Field inspections	0	Total: 2,000 Male: 960 Female: 1040	Total: 4,970 Male2,080 Female: 1,920	Willingness of farmers to participate in project interventions
Outcome 2. Smallholder water resources secured to reduce the risks from droughts and low rainfall	NA	NA	NA	NA	NA	
***Output 2.1.** Enhanced and modernized on-farm climate-proofed irrigation systems*	Area of farms with improved, on-farm climate-proofed irrigation systems	Farm surveys Field inspections	0	2,000 ha	4,488 ha	Investments on irrigation expansion and maintenance by MiRiego enable on-farm interventions to improve irrigation systems.
	Number of new water reservoirs	Farm surveys Field inspections	Community reservoirs: 351 Family reservoirs: 275	Community reservoirs: 651 (300 new) Family reservoirs: 1,275 (1,000 new)	Community reservoirs: 1,351 (1,000 new) Family reservoirs: 5,275 (5,000 new)	

Output 2.2 Strengthened capacities for the management of on-farm climate-proofed irrigation	Number of community promoters whose capacity on irrigation management have been strengthened	Pre-training and post-training assessments	0	Total = 150 promoters	Total = 450 promoters	At least 450 members of the community are interested in the role of promoter and are available for training. The capacity of the community promoters will be assessed with post-training assessments.
Outcome 3: Restored and conserved micro-watersheds and ecosystem functions and services	N/A	N/A	N/A	N/A	N/A	N/A
Output 3.1. Restored and conserved ecosystem management for enhanced climate resilient watersheds	Number of ecosystem restoration plans implemented	Survey	0	5	14	The Watershed Master Plans are instruments for planning and integrated watershed management, guiding decisions to solve problems in the watershed. These Plans were prepared with a focus on adaptation to climate change. Its elaboration must be agreed between the different actors and consider the multiple uses of water and other natural resources in the basin.
Output 3.2*. Information and long-term monitoring system for water sources at place*	Number of tools (online webpage) for monitoring, consolidation and dissemination of information (on climate, weather conditions, food production, water availability and others)	Online operational verification	0	0	1	The tool will be an annex to the existing MMAyA webpage, and will provide up to date information on various indicators such as water resources, climatic and weather conditions. The tool will also be incorporated

						in the National Early Warning System
Outcome 4: Enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms	Climate risk assessment tool adopted by defined institutions to scale up financial mechanisms for small scale farmers	Operational information	0	0	1 tool	The tool will gather data on the performance and the progress of implementation of the financial mechanism as well as data on climate risks. This tool will also consider a table of benefits regarding the resilient practices adopted by beneficiaries and their climate change adaptation technical options to provide a solid ground for the financial mechanisms. Progress will be monitored periodically through the portfolio of new loans, the number of requested technical assistance by small farmers to the financial institutions, and the effects of the resilient agricultural practices adopted, such us percentage of soil humidity, increased soil coverage, etc. This antecedent will create transparency and provide details for investment decision making.
Output 4.1. *Strengthening capacities for national and sub-national government entities to implement policies and norms for the*	Number of technicians from local organizations and municipalities whose capacities have been strengthened on climate-resilient	Pre-training and post-training assessments	0	Total=160 Male=83 Female= 77	Total=400 Male=208 Female= 192	Staff from local organization and municipalities are available for training sessions. Staff are retained by local organizations and municipalities for a period

climate-resilient food production under irrigation systems, integral watershed management and monitoring of ecosystem functions and services	agricultural and integral water management practices (including the use of tools like CROPWAT and MOSAICC)					long enough to allow for transmission and multiplication of knowledge.
***Output 4.2**. Improved financial mechanisms that support climate-resilient agricultural production and irrigation systems to mobilise increased finance for farmers*	Number of people in farming households with access to a financial mechanism[143]	Surveys	0	0	Total = 2,224 Male=1,090 Female=1,134	Continued willingness of the financial partners to be engaged in the project activities and the presence of enabling policy and legal framework.
***Output 4.3.** Strengthening local governance in participatory climate adaptation, early warning systems and long-term monitoring system*	Number of territorial platforms who have incorporated climate change adaptation mainstreaming in the implementation of policies and strategies	Minutes of operating consultative territorial platforms	0	3 consultative territorial platforms	7 consultative territorial platforms	Stakeholders are interested in participating in coordination and consultative territorial platforms and agroclimatic platforms. Membership and proceedings of coordination and consultative territorial platforms, allow for participatory processes that legitimate platforms.
Project/programme co-benefit indicators						
Co-benefit 1. Enhanced CO_2 sequestration, capture and storage potential due to avoided deforestation and increased soil carbon	*Total area with avoided deforestation*	Field inspection	0	20,000 ha	40,910 ha	The restoration activities will contribute to enhanced delivery of ecosystem services and biodiversity. Same as the methodology for core indicator 4

[143] Under output 4.2, At least 1 green financial mechanism for production and irrigation loans targeting women and young producers has been designed and is being implemented. The development of this activity will be strongly supported by the Productive Development Bank (BDP), a financial intermediation entity regulated by ASFI (Supervising authority for financial systems)

	Reduced (sequestrated) GHG emission.	Field inspection and calculation using EX-ACT	0	-20,000 tCO2e	-78,000 tCO2e	Emission reductions due to improved crop and forest management / restoration outweigh increased emissions from investments, transportation and refrigeration.
Co-benefit 2. Improved inclusion of young men and women in agricultural sector and reduced rural-urban migration	*Number of youth engaged in the agriculture sector, disaggregated by gender*	Household survey	0 young people	4,000 young people	10,000 young people	Baseline needs to be determined at the start of the project implementation, and once there more clarity on youth inclusion based on the baseline, the target (mid-term and final) will be defined. The targets will be adjusted afterwards with a baseline survey.
	Number of women engaged in the agriculture sector	Household survey	0 women	7,000 women	20,000 women	

E.6. Project/programme activities and deliverables

All project activities should be listed here with a description and sub-activities. Significant deliverables should be reflected in annex 5 implementation timetable. Add rows as needed.

Please number the activities as shown below to indicate association of activities to the related outputs provided above in section E.5. Similarly, please number sub-activities as shown below to associate to the related activity.

Activities	**Description**	**Sub-activities**	**Deliverables**
Activity 1.1.1 Provision of climate technologies to address vulnerability and increase resilience in the Valles Macro-region	Provide technical assistance for the adoption of the integral packages of climate technologies for agricultural adaptation	**1.1.1.1** Incorporation of solar tents or greenhouses is proposed as an intervention, to protect crops and avoid losses due to frost. Provision of anti-hail nets is proposed as an intervention to protect crops and avoid losses due to hail.	• 1,200 family and communal solar tents for growing vegetables have been implemented with participation of at least 30% women and 10% youth. • 600 anti-hail nets have been installed to protect vine and fruit crops in municipalities at high risk of hail. • 1,000 frost blankets have been implemented in vegetable crops in municipalities with a high and very high risk of frost.

		Provision of thermal blankets is proposed to protect crops and avoid losses due to frost. ● Incorporation of hydrogel in crop plant to avoid losses due to droughts.	At least 5,200 small-scale producers (30% women and 10% youth) have incorporated hydrogel into their fruit plantations
Activity 1.1.2 Capacity building on climate resilient agricultural practices and support production and delivery of biological agricultural inputs to contribute to increased resilience and productivity of agricultural systems.	Conduct training on the use and operation of the technologies implemented under activity 1.1.1, as well as training in agroecological production (crop planting seasons, crops that require less water in drought areas, agroforestry) in the proper use of agricultural inputs and the provision of organic inputs (fertilizers and biological products for pest control) appropriate to agronomic and environmental needs, on-farm preparation and use of biological inputs for ecological fertilization and pest management, in addition to generating greater awareness on the effects using of agrochemicals.	**1.1.2.1** ● Design the training curriculum for each of the topics (implementation of climate resilient technologies, agroecological management and agroforestry) ● Realize the stakeholder consultation meetings to properly design the training curriculum and to explain on the expected results of the capacity building ● Conduct trainings in conservation practices, agroforestry ● Conduct trainings and generating greater awareness about the use of agrochemicals.	● At least 120 producer associations (at least 40 led by women) that have been trained in use of climate resilient technologies, agroecological production, conservation agriculture and/or agroforestry Training materials for: ● Agroecological management (including changing planting times and crops to adapt to drought) ● Agroforestry ● Awareness about the effects of using agrochemicals
Activity 1.2.1 Development and implementation of community and associative productive enterprises	Provide capacities and know-how of communities and associative productive enterprises by putting in place enabling environments and required information to allow vulnerable populations to improve access to markets.	**1.2.1.1** ● Facilitate the processes and provide technical assistance in organic certification and/or agroecological certification of agricultural, beekeeping, and other products ● Improve the supply of agricultural products by facilitating market access for agroecological products by organizing fairs and constructing new markets for the marketing and retail of agricultural products	● At least 120 producer associations (at least 40 led by women) that have received training and technical assistance for the organic certification process ● Organize at least 5 national, 10 regional and 5 international fairs to promote and market products, ensuring the participation of women and young people ● At least 3 markets (national and local) for marketing agroecological products have been identified and opened.

Activity 1.2.2 Technical support and implementation of collection and marketing centers for agroecological products.	Strengthen community-based and associative productive ventures related to resilient agroecological management within the framework of the consolidation or implementation of centers for the collection, processing and marketing of agroecological products.	**1.2.2.1** Construction of two collection and marketing centers ● Implement entrepreneurship incubator for community-based and associative productive ventures.. ● Technical assistance and implementation of centers for the collection, processing and marketing of agroecological products.	● Four (4) collection and marketing centers built for agroecological products ● One (1) incubation methodology implemented and 120 community-based productive ventures, at least 40 of which led by women and 20 led by young people, designed for implementation. ● At least 24 community-based and associative productive ventures, involving women and young people, receive technical and financial assistance.
Activity 1.2.3 Promoting climate resilient value chains for livelihood diversification according to the prioritised region (beekeeping, among others).	Economic diversification is promoted in the context of increasing resilience to climate change. In this regard, the alternative value chain of beekeeping is proposed	**1.2.3.1** ● Implement the actions for the strengthening of the beekeeping ● Technical assistance to promote beekeeping not only for honey production, but also for the promotion of pollinators.	20 associations of honey producers, both men and women, at the local level 3 regional associations have been strengthened in production and marketing processes and pollinator conservation
Activity 2.1.1 Improve and expand the water reservoirs network to optimize water harvesting activities linked to on-farm climate-proofed irrigation systems	Implement water reservoirs to optimize water storage activities linked to resilient irrigation systems is proposed as an intervention. The municipalities in the project intervention area with a very high and high risk of continued drought are prioritized.	**2.1.1.1** (GCF) Strengthen and implement community and family water reservoirs with geomembrane and/or water tanks to optimize (rain) water harvesting activities linked to resilient irrigation systems. **2.1.1.2** (MMAyA) Improve and strengthen small water reservoirs (Structures with less than half a million cubic meters of reservoir, with a length of less than one kilometer and a crown height of less than 10 meters are considered small), to optimize water storage and water availability. MMAyA will implement water systems only until the hydrant.	● 1,000 community reservoirs and 5,000 family water tanks have been implemented in municipalities with a high and very high risk of drought.

Activity 2.1.2. Update the inventory of irrigation systems implemented, to enable the implementation and revitalization of climate-proofed on-farm irrigation systems	Update and complement the water inventory to define irrigation interventions in selected sites to achieve the interventions' best efficiency and effectiveness.	**2.1.2.1** • Collect updated data on the status of the irrigation systems implemented • Analyze collected data and develop inventory	• 1 updated Inventory of irrigation systems prepared and published
Activity 2.1.3. Implement and revitalize technified and on-farm climate-proofing irrigation systems	Upgrade the irrigation system, to optimize water harvesting activities in the face of prolonged drought periods. The municipalities in the project intervention area with a very high and high risk of continued drought are prioritized, but where there exists no water deficit in the available water resources.	**2.1.3.1** • Implement solutions for revitalizing of the on-farm irrigation systems including differentiating seasonal and perennial crops.	• 4,448 farm hectares have been revitalized and/or equipped with technified and resilient irrigation systems.
Activity 2.2.1 Strengthen capacities of key stakeholders (including community promoters, technicians and professionals) to enable locally-owned technological innovation processes related to on-farm climate-proofed irrigation systems.	Conduct training and strengthening technical capacities in irrigation for community promoters, as an incentive for local producers to effectively adopt and manage climate-proofed irrigation systems.	**2.2.1.1** • Design the training curriculum through the Farmer Field Schools • Conduct stakeholder consultation sessions to design the curriculum • Conduct regular consultation sessions led by the extension workers • Conduct training and demonstration field visits to manage the irrigation systems implemented under 2.1.3	• At least 5 farmer's field schools have trained 448 (30% women and 10% youth) community promoters for the implementation of climate-proofed irrigation systems. • Through at least 3 strategic alliances between the technical education entities and universities in the project's intervention area, 120 technicians have updated their knowledge on climate – proofed irrigation systems.
Activity 2.2.2: Replicate technological innovation processes related to on-farm climate-proofed irrigation systems to up-scale the knowledge to other communities through the strengthening of capacities of key actors, technicians and professionals in national and subnational levels.	Conduct specialized training to promote and strengthen technical capacities of key actors, technicians and professionals in national and subnational levels to replicate knowledge and ownership and scale-up climate-proofed irrigation systems.	**2.2.2.1** Strengthen capabilities of key actors, technicians and professionals in managing climate change risks and upscaling resilient technified irrigation systems.	• 5,000 agricultural production units have been trained

	This activity will be implemented with a $us. 1,000.000 co-financing of MMAyA.	Conduct specialized trainings and demonstration field visits.	
Activity 2.2.3: Design an O&M Plan for the irrigation systems including the legal agreements between MiRiego, Municipalities and the Irrigation Committees.	The plan's purpose is to ensure the irrigation committees are able to cover O&M costs once project is concluded. Therefore, in this activity the content of the plan and the legal agreement will be designed.	**2.2.3.1** Adapt content of the O&M plans according to each context and organization of the micro region Define content of legal agreements.Capacity building to implement the O&M Plans	7 O&M plans designed for the irrigation systems ● 1 standard legal agreement written and validated
Activity 2.2.4: Promoting the signature of the legal agreements and the O&M Plans for the irrigation systems between MiRiego, Municipalities and the Irrigation Committees	The purpose of the legal agreements is to ensure the commitment for the O&M as a requirement before the investment and to monitor the fulfillment of commitments.	**2.2.4.1** ● Signing agreements between municipalities and the Irrigation Committees ● Monitor the fulfillment of commitments for the signed O&M plans	7 O&M plan signed in each micro region 7 Legal agreements signed (per micro region)
Activity 3.1.1 Development and implementation of integral micro-watershed management and water use plans to enhance climate change adaptation.	Develop and implement water use plans, which will allow local producers to make responsible water use from source to consumption. This will benefit the strengthening of diversified agricultural production systems and thus will support the resilience of agroecosystems. For the implementation of the water use plans, affected rural land owners, both men and women, will receive technical assistance regarding water use in productive systems.	3.1.1.1 Update the inventory of water sources in the Valles Macro-region, including subnational and community-based territorial management practices Implement a climate change adaptation strategy with a focus on the conservation of watershed ecosystems, that regulate the hydrological cycle in communal and/or municipal areas that will be used to mainstream climate change in the water use plans.	An inventory of water sources for the municipalities prioritized by the project in the Valles Macro-region. 14 water use plans implemented
Activity 3.1.2 Implement restoration processes in micro-watersheds, to	Perform restoration practices for the conservation and restoration of	**3.1.2.1**	17,510 ha restored with native species

increase resilience and climate adaptation by enhancing ecosystems functions and services.	watersheds and their environmental functions. Restoration measures as an intervention to recover water sources and degraded soils. The intervention will consist of the restoration with native species, according to each selected site's ecological and environmental characteristics.	(GCF) Promote and implement restoration measures as an intervention to recover water sources and degraded soils. The intervention will consist of the restoration with native species, according to each selected site's ecological and environmental characteristics. **3.1.2.2** (MMAyA) Strengthen forested and reforested processes for the recovery of soil organic matter and environmental functions, will Implement nurseries for seedlings provision for reforestation processes (including monitoring).	Monitoring report for the restoration activities.
Activity 3.2.1 Develop and implement an online tool (annexed to the MMAyA´s web page) for monitoring, consolidation and dissemination of information relevant for informed climate-sensitive planning and decision-making processes related to sustainable water use (based on climate, weather conditions, foot print of food production, water availability	Design and implement a monitoring tool to generate up-to-date information about the availability of water resources in quantity and quality over time, climatic and weather conditions, access to water in the target region and agro-food system related to water balance monitoring in a context of climate change. The tool will allow farmers to make informed and effective decision making especially on the use of water resources for agriculture, but also for other uses (domestic, etc).	**3.2.1.1** ● Implement the methodology for calculating the water footprint in agri-food systems in the project's target area, to contribute to the micro and macro-regional water balance. The climate footprint (water and energy use) will be used to calculate the footprint of traditional and climate-proofed irrigation systems in conventional and agroecological production systems. ● Integration of the analysis and results of the water footprint and balance in agri-food systems into the state's integrated planning system in order to contribute to the reporting, monitoring and verification of the NDC water and food production sector. ● Design and implement the tool and provide capacity building on using the tool to national and subnational authorities	1 Online tool for monitoring and dissemination of information

		• Disseminate the information provided by the online tool for better planning and decisión – making processes • Incorporate the online tool to the National Early Warning System	
Activity 4.1.1 Facilitate capacity development and consultation processes to enable the design and implement national and sub-national policies, regulations and plans (including PTDIs) that contribute to climate change adaptation and mitigation processes.	Support the development and follow up on the implementation of territorial planning instruments (PTDI), with local actors to generate capacities and correct some of the technical problems that occurred with the first version of the PTDI.	**4.1.1.1** Perform processes to monitor the design and implementation of policies at the national and subnational level that contribute to climate change adaptation processes linked to the conservation of watershed, climate-proofed irrigation systems and productive diversification. • Strengthen the PTDI design and implement PTDIs to improve land for land use and the prioritization of productive activities in line with the soil aptitude, practices of resilience and conservation of water sources, organic soil capacity, among others.	At least 10 institutions at the national and the 65 municipalities included in the project have been trained in the design and implementation of policies related to climate change adaptation. 24 PTDI developed with local actors that includes climate-sensitive planning and decision-making processes related to sustainable water use 12 PTDIs implemented
Activity 4.2.1 Partner with existing domestic funders and financial institutions to develop innovative financial instruments that enable the implementation of climate-proofed irrigation and ecosystems restoration investments.	Strengthen and design together with national and sub-national entities financial mechanisms for the climate resilient production of food, installation and maintenance of irrigation systems and mountain ecosystems restoration and conservation. This includes the development of market analysis, financial product and instrument co-design, needs assessments for deployment. The partnership includes strengthening the capacities of public/private national/sub-national entities for the development of tailored financial instruments and mechanisms.	**4.2.1.1** Consolidate the refundable financial incentives policy with non-conventional guarantees, based on the implementation of new financing portfolios for irrigation and productive systems for communities, small-scale producers and associations Provide specialized Technical Assistance and capacity building to INSA, BDP and FINRURAL to develop and implement an innovative financial mechanism and to analyze the possibility to expand this activity to other private financial	• At least 10% of the loan portfolio for production and irrigation has been reactivated and/or increased for the Valles Macroregion. • At least 1 green financial mechanism for production and irrigation loans targeting women and young producers has been designed and is being implemented. • One risk-indexed micro insurance designed and implemented • One funding mechanism designed and implemented (related to the water funds) • 200 staff of INSA, BDP and FINRURAL, Water Funds trained

		institutions (including a market analysis and needs assessment) The technical assistance to BDP and FINRURAL will include among others; design technical guidelines related to the current legislation to establish the climate resilient credits and concessional credits lines (see more details in table 9 FP). Provide technical assistance and capacity building to INSA for the design of the risk-indexed micro insurance for the Valles Macro region in a highly participatory manner. Provide technical assistance and capacity building to the different water funds to develop and establish an improved funding mechanism that takes into consideration climate change adaptation and mitigation. Develop a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds and scale up and increment the number of beneficiaries - project interventions will develop a Financial Strengthening Plan for FONABOSQUE to leverage new climate-related funds and scale up and increment the number of beneficiaries	• One financial Strengthening Plan for FONABOSQUE
Activity 4.2.2: Strengthen the capacities of communities, smallholders and associations on financial management and access to innovative financial instruments relevant for climate resilient agriculture.	Stakeholders will be trained to ensure they are enabled to access and manage finance for climate resilient agriculture, ecosystems conservation schemes, climate-proofed irrigation systems	**4.2.2.1** Design a training methodology on accessing and managing financial and insurance mechanisms.	• One methodology designed. • 20,680 persons trained. • At least four roundtables realized

		Strengthen capacities of communities, smallholders and associations on financial management Organize roundtables to connect farmers with financial and insurance entities. ● Provide specialized Technical Assistance to INSA to develop and implement innovative insurance mechanism and to analyze the possibility to expand this activity to other private financial institutions	
Activity 4.3.1 Capacity strengthening for local stakeholders (including smallholders, public officers, local CSOs and relevant academia) on the integration of climate change risks for decision making to increase the resilience of smallholders and communities	Strengthen institutional capacities to govern the Early Warning System for Agricultural Risks' implementation process to provide timely information to local producers and decision-makers though the Coordination and Consultative Territorial Platforms as key channels of information for the smallholders and communities.	**4.3.1.1** ● Integrate the municipalities of the Macro region of the Valleys into the national Early Warning System. ● Strengthen the dissemination of timely information to local producers	● At least 80% of the municipalities established protocols for EWS dissemination ● At least 80% of the municipalities are linked to the national EWS to provide and receive agroclimatic information.
Activity 4.3.2. Establish coordination and consultative territorial platforms (to facilitate climate change adaptation mainstreaming into the participatory implementation of policies and strategies), in accordance with the Comprehensive Management Plan for Watershed Resources and Integrated Watershed Management.	Strengthen Coordination and Consultative Territorial Platforms in line with Comprehensive Management Plan for Watershed Resources and Integrated Watershed Management and facilitate key stakeholders in decision making processes	**4.3.2.1** ● Strengthen and implement the territorial platforms for the prevention and control of agricultural risks ● Implement stakeholder consultations with key stakeholders to strengthen their capacities and ensure their full participation in the platform ● Develop guiding materials for the operation of the platforms	At least 7 territorial platforms for comprehensive and resilient water management and sustainable production systems have been strengthened and/or set up. Guiding documents for facilitation of platforms prepared

Activity 4.3.3. Enhance capacity of Municipalities to strengthen the monitoring and reporting base for the macro region related to climate change impacts	Strengthen the capacity of municipalities in using mainstreamed methodology to assess the damage and economic losses of (extreme) climate change as well as gathering the data and information related to the monitoring of the project indicators	**4.3.3.1** ● Implement stakeholder consultations with key stakeholders to strengthen their capacities and ensure their full participation ● Implement capacity building for the relevant government officials to use the methodology and analyze the data and to be able to use the results for decision making ● Develop knowledge management products for the general public and the beneficiaries related to the progress of the project ● Promote the implementation of a common methodology for the systematic evaluation of damages and losses due to disasters in agriculture in the Valleys Macro-region to assess agricultural damages and losses for temporary monitoring that supports decision-making for investments in more efficient techniques and technologies to face climate change risks ● Replicate and implement the methodology for the evaluation of damages and losses and its monitoring in the project intervention area	One training program to strengthen the capacity of Municipalities in monitoring and reporting climate change impacts. One methodology to assess damage and losses disseminated and implemented
Activity 4.3.4: Impact evaluation and developing knowledge management products	Knowledge generation and documentation of evidence of the impact from the project, lessons learned and best practices.	**4.3.4.1** Design the knowledge management strategy Develop the impact evaluation methodology	Two impact evaluation progress reports Five knowledge management products One training report

		Train local municipalities in collecting and analyzing data according to the impact evaluation methodology Implement field inspections to gather the data necessary according to the impact evaluation methodology Develop and disseminate the knowledge management products with data and information that will be generated from the project.	

E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)

277. In its role as Accredited Entity, FAO (specifically the FAO-GCF project supervision team) will oversee and supervise the implementation of this project in accordance with the FAA and the Accreditation Master Agreement (AMA) signed between FAO and the GCF. As per the GCF Monitoring and Accountability Framework, and in accordance with the AMA, FAO will provide the GCF with an Inception Report, Annual Performance Reports, an independent Mid-term Evaluation report, a Project Closure Report, an independent Final Evaluation report, and an Impact Evaluation report. FAO will also provide semi-annual and annual Financial Reports throughout project implementation.
278. FAO has standard M&E procedures which is compliant with the GCF performance measurement framework. FAO will manage and coordinate reporting to the GCF according to its standards and procedures. The monitoring will take place under the following three levels:

Project execution level:

279. The project will include an implementation of a monitoring system to understand efficacy, targeting and verifying the assumptions that the program is making as well as implementing a learning plan so elements emerging from the monitoring systems can feed back into the project implementation and planning Components
280. The M&E at this level will be coordinated by the Technical Committee (TE) and the Project Steering Committee (PSC) Data will be stored in a database accessible to the GCF, the counterpart as well as to FAO. Georeferencing will enhance both TC, PSC and FAO monitoring and evaluating as well as official counterpart to closely monitor components, development and assess impacts and contribution to approved targets at midterm and completion. Additionally, it will allow to improve the capacity of the program to provide technical assistance to beneficiaries and monitor advancements and impacts. Georeferenced activities and resulting intervention areas will be also analyzed via remote sensing and photointerpretation techniques so to ensure Result Based M&E and support Result Based Management of the project. Results of the different analysis will be presented annually via a dedicated “Project’s Implementation Atlas”. Data, supervision reports and conclusions obtained by the above-mentioned process will be presented annually to the GCF as well as to the other stakeholders.
281. Supervision, Support and Evaluation level: FAO will support the TC and PSC in reviewing and analyzing progress reports and to assess performances against baseline and targets. FAO will also, secure according to its rules and regulations, financial control and midterm evaluation and final evaluation phases via an independent and external evaluation expert.
282. In accordance with the AMA between FAO and GCF, the FAO Office of Evaluation will be responsible for the independent interim and final evaluations. The evaluations will be conducted using a question-driven approach, and address the GCF evaluation criteria. The interim evaluation will be instrumental in contributing – through operational and strategic recommendations – to improve implementation, setting out any necessary corrective measures for the remaining period of the project. The final evaluation will

assess the relevance of the intervention, its overall performance, as well as sustainability and scalability of results, differential impacts and lessons learned; coherence in climate finance delivery with other multilateral entities; gender equity; as well as innovativeness in result areas. The evaluation should also assess the extent to which the intervention has contributed to the Fund's higher-level goal of achieving a paradigm shift in adaptation to climate change in Bolivia. The evaluation will draw on mixed-methods, using qualitative methods (e.g. participatory rural appraisal) in combination with counterfactual analysis, depending on the existence of reliable control group data from the project's baseline and end line surveys. In addition to primary data collected by the evaluators and secondary national data, both interim and final evaluations will draw on the monitoring reports and activities prepared by project staff. Careful attention will be paid to the disaggregation of data, results and components by gender and cultural groups, considering the high percentage of indigenous peoples in the project area and the different level of vulnerability of project beneficiaries.

283. Strategic level: Annual results and related analysis, jointly prepared by FAO and TC will provide the base for each annual planning exercise. This will be presented to the PSC to support its strategic role and to secure transparency and result based strategy development.

Independent Evaluations

284. 260a. To provide an external viewpoint on the progress of the project and the achievement of its objectives, and in line with the AMA signed with the GCF, two independent project evaluations will be conducted by FAO – interim and final evaluations. In line with the FAO policy on evaluations, the interim (midterm) and final evaluations may be either managed by FAO Office of Evaluation or decentralized (under the responsibility of decentralized offices). In both case, they will be carried out by a team of independent external consultants. The evaluations will also be conducted in line with the GCF Evaluation Policy, and will follow the GCF's Integrated Results Management Framework, namely containing an assessment of the paradigm shift potential and its enabling environment

F. RISK ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures (max. 3 pages)

Please describe financial, technical, operational, macroeconomic/political, money laundering/terrorist financing (ML/TF), sanctions, prohibited practices, and other risks that might prevent the project/programme objectives from being achieved. Also describe the proposed risk mitigation measures. Insert additional rows if necessary.

For probability: High has significant probability, Medium has moderate probability, Low has negligible probability
For impact: High has significant impact, Medium has moderate impact, Low has negligible impact
Prohibited practices include abuse, conflict of interest, corruption, retaliation against whistleblowers or witnesses, as well as fraudulent, coercive, collusive, and obstructive practices

Selected Risk Factor 1

Category	Probability	Impact
Governance	Medium	Medium

Description

Limited implementation of commitments by political decision-makers in the design, preparation, presentation and public investment of the project.

Mitigation Measure(s)

The design of the project has been co-created in tight collaboration with the national and local authorities and integrates their political priorities. Moreover, the project is designed in such a way that it will directly contribute to national and international climate change commitments (e.g. NDC). This is an incentive for the government authorities to engage in the project. Additionally, RECEM-Valles considers a holistic awareness and engagement strategy tailored to enhance the project ownership of national and sub-national institutions. The implementation arrangements of the project will mitigate this risk through the creation of an institutional strategy to facilitate political processes and enable national and local government involvement.

Selected Risk Factor 2

Category	Probability	Impact
Governance	High	Medium

Description

Change of central and local authorities during implementation of the project.

Mitigation Measure(s)

The probability of this political risk is high given the likelihood of elections and changes in government officials in the project period. The risk that new officials will not support the project will be mitigated through information sessions to update them on the project actions and benefits to their constituencies. Additionally, the prioritization of bottom-up agreements around implementation plans and strategies with local communities that benefit from the Project aim to establish a permanent and continuous work agenda.

Selected Risk Factor 3

Category	Probability	Impact
Technical and operational	Low	Low

Description

Poor adoption and buy-in of agroecological management and technologies by communities and producers' associations

Mitigation Measure(s)

This risk will be mitigated through the use of participatory approaches in planning and implementing activities at the local level. This approach incorporates extensive and inclusive consultation of different stakeholders including indigenous peoples and marginalized groups and their participation in the designing of interventions and plans relevant to their livelihoods as well as through actions that strengthen their participation and rights in natural resources management. The Environmental and Social

Management Framework (ESMF) contains a framework for the development of an Indigenous Peoples Plan that meets the standards of GCF's Indigenous Peoples Policy. The ESMF provides a detailed account of the participatory process related to the various Components and activities of the project including the specification of the types of analysis on potential social, cultural or economic impacts required (incorporated in the vulnerability assessments). These measures are expected to further reduce the low probability of the risk.

Selected Risk Factor 4

Category	Probability	Impact
Technical and operational	Medium	Medium

Description

Increased competition over land and water resource leads to community conflicts and could be exacerbated as economic opportunities increase.

Mitigation Measure(s)

The project is designed via participatory community consultations, and will be implemented largely by smallholder farmers, community organizations and farmer associations. The project will promote dialogue and consensus-building processes through consultation and coordination of territorial platforms to achieve inclusive decision-making and design solutions and actions to be adopted. When necessary, the project will support public authorities in enactment of local regulatory measures with participation of stakeholders. These mitigation measures are expected to reduce the probability of the risk occurring to 'low'.

Selected Risk Factor 5

Category	Probability	Impact
Technical and operational	Low	Medium

Description

Conflicting interests of the beneficiaries may lead to limited advances of the project activities.

Mitigation Measure(s)

The project adopts a strong participatory approach from its design stage and mainstreamed in the project activities. Initial stakeholder consultation has already resulted in a good understanding of beneficiaries' priorities and needs. The project is designed based on these priorities and will promote participatory decision-making regarding the practices and technologies to be implemented. The project will apply a consensus building mechanisms through dialogue campaigns for concerted resolution of conflicts.

Selected Risk Factor 6

Category	Probability	Impact
Governance	Medium	Medium

Description

Lack of financial capacities at the level of local governments for counterparts to meet and participate.

Mitigation Measure(s)

Strengthening and expanding the participation of the national and sub-national (e.g. departmental and municipal) government levels to contribute financially to the activities established in the project including resource mobilization and coordination.

Selected Risk Factor 7

Category	Probability	Impact

Legal	Medium	Medium
Description		
Economic activities such as mining activities, concessions, and claims might affect the effectiveness of the restoration measures.		
Mitigation Measure(s)		
Although no major mining investments are foreseen in the project areas, the project will establish territorial management mechanisms, which are designed to manage competing land uses and claims. These mechanisms provide the means through which future land use changes can be coordinated and managed, particularly with regard to extractive activities. Those mechanisms operate at the municipal level, since the Municipality is the main decision maker over land reallocations. These measures are expected to lower the probability of the risk occurring to 'low'.		
Selected Risk Factor 8		
Category	Probability	Impact
Other	High	Medium
Description		
Extended period of the health pandemic (COVID-19) and related restrictions may affect the timeline for delivery of the project activities and further affect rural livelihoods.		
Mitigation Measure(s)		
The project will take all necessary measures to promote sanitary and safety measures to protect the health of project staff and beneficiaries. The project will establish healthy safety protocols and an operational strategy to ensure safe operations on the field. To the extent possible, if needed, certain activities as meetings at national level may be conducted online, depending on country's situation, in order to avoid delay in high-level decision-making. Additionally, the project aims to establish opportunities for the communities to achieve self-subsistence which contributes to their increased resilience amidst multi-dimensional shocks such as a health pandemic.		
Selected Risk Factor 9		
Category	Probability	Impact
Other	Medium	Low
Description		
Natural disaster events such as prolonged droughts or higher frequency of drought as well as torrential rainfalls destroy or delay project interventions.		
Mitigation Measure(s)		
The project is designed to operate within the context of recurrent drought or torrential rainfall. The occurrence of such climate extremes will inevitably have consequences for project delivery but will also strengthen support for the role of the project in mitigating such risks in the long term. Enhanced information and early warning systems will strengthen drought management while restoration of natural resources will reinforce adaptive capacity and demonstrate the value of the project. Additional livelihood activities will also reinforce adaptive capacities and resilience of the communities.		
Selected Risk Factor 10		
Category	Probability	Impact
Governance	Low	High
Description		

Risks of money laundering and countering the financing of terrorism and UNSC sanctions
Mitigation Measure(s)
FAO includes in the project agreement signed between FAO and the Government of Bolivia clauses related to AML/CFT and other sanctions, as follows:: a)The Government shall comply, and shall require all persons and entities engaged in its activities under the Project to comply, with all internal anti-money laundering, counter-terrorism financing laws, rules, and regulations; b) The Government confirms it has obtained sufficient undertakings from all persons and entities involved in its activities under the Project that they shall not engage in any prohibited practices; the Government undertakes and confirm that it shall comply with the substantive objectives of the GCF's Policy on Prohibited Practices; c) Consistent with numerous United Nations Security Council resolutions adopted under Chapter VII of the UN Charter, the Government and FAO are firmly committed to the international fight against terrorism and, in particular, against the financing of terrorism. It is the policy of the Government and FAO to seek to ensure that none of their funds are used, directly or indirectly, to provide support to individuals or entities: i) associated with terrorism, as included in the list maintained by the Security Council Committee established pursuant to its Resolutions 1267 (1999) and 1989 (2011); or ii) that are the subject of sanctions or other enforcement measures promulgated by the United Nations Security Council. This provision must be included in all agreements that may be concluded with third parties for the implementation of activities under the Project. In accordance with FAO rules and regulations, FAO will perform all necessary actions to ensure that the project be implemented in full compliance with any UN sanctions list that may be of relevance. There are no entities or individuals who are the subject to or affected by United Nations Security Council sanctions regimes will be involved in such projects/activities, either as counterparties or as beneficiaries During project implementation FAO, as AE, will ensure close monitoring and supervision through its offices in the regional office and HQ in order to ensure that the activities are implemented in full compliance with the signed project agreement. FAO will apply its own fiduciary principles and standards relating to any "know your customer' checks, AML/CFT, and financial sanctions imposed by the United Nations Security Council, which should enable it to comply with the objectives of the Policy on Prohibited Practices and the principles of the AML/CFT Policy. In accordance with FAO rules and regulations, FAO will perform all necessary actions to ensure that the project be implemented in full compliance with any UN sanctions list that may be of relevance. There are no entities or individuals who are the subject to or affected by United Nations Security Council sanctions regimes will be involved in such projects/activities, either as counterparties or as beneficiaries. Within the framework of this project, the FAO will facilitate the resolution and/or clarification of any concern directly linked to implementation of the project that beneficiaries and involved stakeholders may have, following the Suriname conflict resolution mechanisms. In case the conflict refers to FAO, the NDA will present the complaints and claims to the Representation of the FAO in the country. If a notice of receipt of the claim is not received within 7 days, the complaint or concern must be sent to the FAO's regional office in Latin America and the Caribbean FAO-RLC@fao.org for action. The project beneficiaries may send a complaint to the FAO Office of the Inspector General, who shall carry out an independent investigation. The procedure for the claims is detailed at http://www.fao.org/aud/. Email: Investigations-hotline@fao.org. FAO is committed to ensuring that its resources are used solely for their intended purposes, that all operations are free from fraud and other corrupt practices, and to being held accountable to donors and beneficiaries for the implementation of its programs. To this end, the Organization has adopted a zero-tolerance policy in respect of fraud and other corrupt practices in all their manifestations. This policy applies, regardless of their location, to all activities and operations of the Organization, whether funded by Regular Programme or Extra-Budgetary Funds; administrative, technical or operational in nature; or implemented by the Organization and/or an implementing partner, including any government agency. This policy applies to all FAO personnel and all contractual arrangements between the Organization and implementing partners, suppliers or other third parties for administrative, technical or operational purposes. The FAO Whistle blower Protection Policy follows the guidelines to report allegations of possible wrongdoing in the activities of the project stated in the Administrative Circular 2019/06[][144]

Selected Risk Factor 11		
Category	Probability	Impact
Governance	Low	Medium

[144] http://www.fao.org/aud/48699-03f867c68c965c8bbad27e7d5f7512e43.pdf

Description
Local Government or Municipality might not endorse the plans or delay the endorsement due to changes in priorities and / or changes in administration.
Mitigation Measure(s)
To ensure that there is a buy-in from the local government, the project will work in close collaboration with the municipalities for the implementation of activity 3.1.1., ensuring ownership from the start of the implementation of the project. The project will demonstrate how it will contribute to the country´s commitments established in the NDC 2022 - 2030 water sector, given that the increase in the area under resilient irrigation for food production is urgently needed. Additionally, the project is aligned to the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth. In parallel, the project supports the Social Economic Development Plan 2021 - 2025, where axis 3 Food and Nutritional Security " and axis 8 "sustainable and balanced environment with protection of mother earth, political, economic, social and environmental scope is established" numeral 8.5.

Selected Risk Factor 12

Category	Probability	Impact
Gender	Low	Medium

Description
On SEAH/GBV, there could be incidences of Gender Based Violence/Sexual Exploitation Abuse and Harassment.
Mitigation Measure(s)
To reduce the possible incidences, an action plan on SEAH/GBV will be developed during the project inception phase. The plan will include activities like annual awareness workshops for contractors, subcontractors and people living in the immediate project area; contractual clauses to enforce the required lawful conduct and legal consequences for failure to comply, the commitment to cooperate with law enforcement agencies investigating cases of GBV, against rape, defilement and other GBV, and a Code of Conduct; sensitize beneficiaries on the prohibition of child labor; and the dissemination of laws protecting the rights of women and girls including raising awareness on families, workshops on gender, and a communication strategy on the prevention of violence and harassment.

Selected Risk Factor 13

Category	Probability	Impact
Technical/Operational	Low	High

Description
Risk of maladaptation
Mitigation Measure(s)
Maladaptation encompasses a range of potential issues. By design, the project does not: - Promote short-term adaptations that decrease adaptive capacity and hinder future choices - Shift vulnerability from one group to another, or one area to another - Erode sustainable development: adaptation strategies which increase emissions, deteriorate environmental conditions and/or social and economic values. Maladaptation is caused by inadequate knowledge, a focus on issues in isolation and on short-term gains that do not take into account the long-term impacts of adaptation options. Maladaptation can be avoided by flexible, multisectoral, inclusive and long-term planning and implementation process. As noted in the FP, FS and ESMF, the project's design reflects: - The benefits of stakeholder engagement, where beneficiaries expressed their needs and constraints - The long-term vision of the project governance mechanism, which will remain in place - The adaptation options: resilient agriculture including agroecology

- The inclusion of the most vulnerable and marginalized groups

In addition, as described in Section D.3 (Sustainable Development) an evaluation was conducted using the Ex-Ante Carbon Balance Tool (EX-ACT) to evaluate the impacts of project interventions on greenhouse gas (GHG) emissions. The EX-ACT analysis includes emissions and reductions related to key elements of the value chains supported by the project including:

- Cropland
- Inputs and construction of agricultural structures and energy use
- Inputs and construction of irrigation and rainwater harvesting structures
- Emissions from water collection structures
- Transport to market
- Refrigerant leakage
- Forest management

The results of a GHG analysis using Ex-ACT indicate net GHG emission reduction over the implementation phase and the full 20-year period of analysis (see the EX-ACT appendix 6 to Annex 2 Feasibility Study for more details).

Therefore, the risks of maladaptation are classified as “Low”.

G. GCF POLICIES AND STANDARDS

G.1. Environmental and social risk assessment (max. 750 words, approximately 1.5 pages)

285. The Environmental and Social Risk Assessment classified the project risk as moderate, although large-scale, significant, or irreversible environmental impacts are not expected. The potential impacts identified are mainly impacts associated with activities that include community participation, especially of indigenous communities, on a purely voluntary and on-demand basis, which can be mitigated effectively and are addressed through the project's selection criteria and social and environmental plan of action.

286. Main risks identified per component are (see for Annex 6, ESMF, for more details) :

Component 1: Strengthened food and income security in changing climate through climate resilient agricultural systems

- Farmers do not follow through on processes needed to transition to organic and conservation farming do not happen because of lack of commitment and motivation, a lack of training and technical assistance.
- Project-dependence. Smallholder farmers depend on the project to do conservation farming, organic farming and agroforestry systems (AFSs).
- Traditional farmers resist changing over to conservation farming and organic farming.
- Farmers use child labour in the context of farming activities
- Vulnerable farmers (including youth, women, migrant farmers) are not interested in participating in project activities
- Government authorities do not hold to their commitments as counterparts to support the activities.
- The principle of Free, Prior, and Informed Consent (FPIC) of Indigenous Peoples affected by the project is not adhered to.

Component 2. Smallholder water resources secured to reduce the risks from droughts and low rainfallI:

- Community reservoirs in areas that are not apt for storing and distributing water to the fields.
- The irrigation infrastructure is poorly designed and built.
- Smallholders do not accept irrigation schemes

Component 3. Restored and conserved micro-watersheds and ecosystem functions and services.

- The wetlands and forests management activities are not implemented properly and so cannot conserve water sources.
- Smallholders do not fully participate in the restoration activities

Component 4. Enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms.

The environmental risks are few/low impact for this component, and mainly comprise of monitoring investments and building the beneficiaries' capacities to implement the project activities properly. There could, however, be environmental impacts as a result of poor management, a lack of training, and not complying with the regulations or following good practices. Social impacts or conflicts may arise because of poor project supervision, monitoring and evaluation.

287. On SEAH/GBV, there could be incidences of Gender Based Violence/Sexual Exploitation Abuse and Harassment, such as:

- Project activities can bring minor influx of labor and employment income differentials in local communities. Projects with minor labor influx of workers may increase the demand for sex work, including the risk for trafficking of women for the purposes of sex work; or the risk of forced early marriage. Furthermore, higher wages for workers in a community can lead to an increase in transactional sex. The risk of incidents of sex between laborers and minors, even when it is not transactional, can also increase.
- Risk of SEA/SH by project personnel e.g. regional and provincial level officials who may ask for sexual favors from women and girls for them to be selected as project beneficiaries.
- Women may face opposition of their husbands and other male family members for their wish to participate in the project. In some households, the situation may escalate to violence.

288. Mitigation measures to prevent, control, mitigate and/or correct can be summarized as follows (see Annex 8 ESMF for full details):

Component 1:

- Ensure that good farming and forestry practices are in force.
- Promote organic products to safe, profitable markets.
- High-value forest species in AFS (Agro Forestry Systems). Keep a good balance of native and exotic species in AFSs, when restocking forests.

- Continually monitor and provide technical assistance for organic farming, conservation farming and AFSs.
- Social and environmentally-aware service and training providers.
- The project will provide technical assistance and know-how to farmers for the preparation organic and biological pesticides and will facilitate the implementation of practices ensuring the use of allelopathic plants.
- Keep to the plan and secure the consent of the local and community authorities.
- Ensure the running of the Territorial Platforms.
- Activities implemented only after free and informed consent has been given
- Provide technical support to Territorial Platforms when they need it.

Component 2:

- Build community reservoirs based on the availability and supply of water as calculated in the technical reports (Water source inventories, water balances, etc.).
- Training sessions on how to use water efficiently for irrigation.
- Close technical supervision when building reservoirs and water distribution systems to the fields.
- Prior consultation with potential beneficiaries and local and community authorities.

Component 3:

- Water source protection and conservation activities closely supervised (technical assessment and bases − documents like the water sources inventory) and with the agreement and support of local communities.
- Ensure that the E&S standards are adhered to, depending on the context.

289. Mitigation measures that are specifically mentioned in the IPP (see in Annex 8 ESMF), recommend the following lines of action to be implemented to mitigate the risks of environmental and social impacts for indigenous populations in the context of the project:

- Line of Action 1: Strengthen the participation of indigenous people in the Project and reduce cultural barriers.
- Line of Action 2: Design a culturally appropriate Project outreach strategy for indigenous producers.
- Line of action 3. Establish a mechanism to address complaints.

290. Mitigation measures that are have been identified in relation to the SEAG/GBV risks are the following:

- SEAH-GBV action plan to be developed during project inception phase.
- Annual awareness workshops shall be undertaken for employees of the Contractor/Supervising Consultant and Sub-Contractors as well as persons working or living in the immediate project area and to provide contact numbers of the nearest law enforcement Agency Office, the Grievance Redress Mechanism and GBV Service Providers to offices, schools and clinics within the project area.
- Contractual Clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV will be inserted in Contract Documents.
- Contractual Clauses with a commitment to cooperate with law enforcement agencies investigating cases of gender-based violence shall be inserted into the Contract documents of the contractor and Supervising Consultant.
- Contractual clauses against rape, defilement and other Gender based Violence as well as child and forced Labor shall be inserted into the contract of the Contractor and Supervising Consultant.
- Workers on site will sign Code of Conduct with sanctions on rape defilement, abuse and other gender-based violence.
- Sensitize beneficiaries/parents on the prohibition of child labor.
- Disseminating laws protecting the rights of women and girls.
    - A community-based approach to the project will be taken, informing families about the importance of the participation of both men and women.
    - Workshops on gender, gender roles, leadership and self-esteem will be held with women's associations and workshops on masculinities with men.
    - The communication strategy will include content on the prevention of violence and harassment.
    - The promotion of co-responsibility in care work will be promoted.

291. FAO will follow the process for ensuring that environmental and social concerns are adequately addressed through the institutional arrangements and procedures used by the project for managing the identification, preparation, approval, and implementation of activities. The following process will be adopted.

Step 1: Defining Activities

292. By design, the project is expected to have far greater environmental benefits than adverse environmental impacts. The potential adverse environmental impacts from the project are likely to be very small and limited. However, it is recognized that such impacts can accrue into larger impacts if they are not identified early during the planning cycle and their mitigation measures integrated into the project planning and implementation.
293. Considering that the activities to be implemented in each site will be the same in nature and scale across the implementation area, it is proposed that screening for potential risks is undertaken at activity level. Activities constitute a valid tool to identify expected impacts and mitigation and monitoring measures.
294. In this context, activities will be identified during the inception phase in Year 1. For each activity, implementing sites will be identified along with activities, including capacity building/training and stakeholder engagement information specific to each site. Each of the proposed technologies and activities of the RECEM Valles proposal have been suggested by community-based stakeholders and family farmers' associations, irrigation associations, municipal and departmental government technicians, as well as national entities such as Mi Riego, the National Irrigation Service, the Vice Ministry of Water Resources and Irrigation, the Vice Ministry of Rural and Agricultural Development, the Bank of Productivity Development, the National Forestry Development Fund, among others.

Step 2: Environmental and Social Risk Screening of Activities

295. FAO's environmental and social screening checklist will determine if an activity will require an Environmental and Social Management Framework (ESMF). While the nature, magnitude, reversibility, and location of impacts are main elements in the screening of activities, expert judgment will be a main factor in deciding whether an ESMF is required for a activity or not.
296. For a activity that requires an ESMF, the project will include a set of mitigation measures with monitoring and institutional arrangements to be taken during the implementation phase to correctly manage any potential adverse environmental and social impacts that may have been identified.
297. FAO will undertake environmental and social screening following FAO's Environmental and Social Screening Checklist. Once the implementation sites and beneficiaries are determined, a screening checklist will be completed per activity and signed off by the national consultant specialist in Monitoring and Evaluation at the Project Management Unit (PMU). The safeguards specialist will aggregate the results of the screening checklists. This document will be sent to ESM Environmental and Social Management) Unit in FAO for endorsement.
298. Screening of activities involve:
299. Checking that the activities involved are permissible (as per the legal and regulatory requirements of the project);
300. Determining the level of environmental assessment required based on the level of expected impacts.
301. The E&S screening checklist will result in the following screening components: (i) determine the category for further assessment; and (ii) determine which environmental assessment instrument to be applied.
302. Pre-implementation safeguards documents (one per activity) will be prepared by the Monitoring an Evaluation specialist in the PMU prior to the implementation of activities and sent to ESM Unit in FAO Headquarters for endorsement. The documents will outline the following information relative to each activity:

- Description of the activities to be carried out in all sites;
- Description of each implementing site;
- Geography and specificities in terms of activities;
- Beneficiaries and stakeholders;
- Map of the site;
- Description of the stakeholder engagement process that was carried out in the inception phase and the stakeholder engagement plan to be carried during implementation;
- Breakdown of information by site about the grievance mechanism and disclosure;
- Aggregated results of the environmental and social screening checklists per sactivity signed off by the Safeguards Specialist in the Management Unit; and
- Where applicable, Environmental and Social Management Plans identifying mitigation measures, indicators, responsibilities and timeframe. The ESMF will be added to the monitoring plan to ensure safeguards performance is regularly reported upon along with stakeholder engagement monitoring per site.

Step 3: Environmental and Social Risk Management (Monitoring and Reporting)

303. Activities classified as medium risk based on the environmental and social risks identified during the screening process will then be required to develop ESMFs that include information on the mitigation actions, the indicators and timeframe where the completion of such mitigation actions are expected.
304. While the nature, magnitude, reversibility, and location of impacts are main elements in the screening of activities, expert judgment will be a main factor in deciding whether an ESMF is required for a activity or not.

The ESMF will include:

305. **Mitigation Measures**: Based on the environmental and social impacts identified from the checklist, the ESMF will describe with technical details each mitigation measure, together with designs, equipment descriptions and operating procedures as appropriate.

Project-level grievance mechanism

306. The project will establish a grievance mechanism at field level to receive complaints; this grievance mechanism has been agreed with beneficiaries (including during the FPIC with indigenous populations) to take place in the context of the Consultative Territorial Platforms to be facilitated in the context of the project (Activity 4.3.3.). Contact information and information on the process to file a complaint will be refined once the consultative platforms are operational and will be disclosed in all meetings, workshops and other related events throughout the life of the project. In addition, it is expected that all awareness-raising material distributed will include the necessary information regarding the contacts and the process for filing grievances, including on the availability of and ways to access the GCF's Independent Redress Mechanism.
307. SEAH and GBV grievances will be managed as incidents with an inclusive, survivor-centered and gender responsive approach, including confidential reporting and mandatory involvement of the FAO E&S and Gender specialists in monitoring the process. In case of GBV, the reporting party will be immediately directed to appropriate GBV referral pathway by the GRM personnel, and directed as necessary to medical care, psychosocial support, legal support, community driven protection measures, and reintegration services. The project will also be responsible for safe and ethical documenting and reporting as part of the safeguards performance monitoring on any grievances received and how they were addressed.

Multi-stakeholder consultations undertaken

308. Initially, in 2018, the first consultations on the RECEM Valles project were carried out by organizing 10 workshops in five departments of Bolivia (Potosí, Chuquisaca, Cochabamba, Santa Cruz and Tarija - where the 63 municipalities of the project area are located), in order to identify the expectations of potencial beneficiaries and project partners regarding the benefits of the project, the needs and demands of local stakeholders (with respect to climate change), and possible risks in project implementation. A major effort was made to ensure the involvement of the departmental and municipal governments of the project area. A total of 282 people participated (mayors of the prioritized municipalities, municipal technicians, members of social organizations, authorities and technicians from the "Gobernaciones"). These consultations were conducted by a permanent organization in the country, ensuring meaningful stakeholder engagement.
309. Subsequently, in 2019, a consultation process was carried out to obtain the Prior, Free and Informed Consent (FPIC) of indigenous communities. The FPIC process was led by the Ministry of Environment and Water (MMAyA), with support from FAO and FILAC (Fund for the Development of Indigenous Peoples in Latin America and the Caribbean). Participants in the process shared their knowledge, practices and expressed the results/lessons learned of own experiences that allowed identifying strategies/activities that have been considered in the project formulation. For this process, seven workshops were held in the cities of Sopachuy, Sucre, Potosí, Camargos, Tarija, Samaipata, Cochabamba, with the participation of 166 people, 52 women, 114 men. Each workshop led to the signing of a certificate of conformity with the consultation process and validity of the project. Participants included representatives of local governments, indigenous organizations and local organizations/associations working in water and natural resource management that are located in the project area, among which the following can be mentioned:

- Trade Union Confederation of Rural Workers of Bolivia- CSUTCB.
- Bartolina Sisa National Confederation of Campesino, Indigenous, and Native Women of Bolivia - CNMCIOB "BS".
- National Council of Ayllus and Markas of Qullasuyo – CONAMAQ.
- Irrigation associations.
- Associations of producers of dairy, flowers, vegetables, corn, potatoes, fruits.

310. In addition, several group and individual interviews have also been conducted with about 54 representatives of Ministries; Programs, Projects, Decentralized and Decentralized Institutions of Ministries; Departmental Autonomous Governments; Municipal Autonomous Governments; Civil Society Organizations; Producers' Associations; Universities and Research Institutes; and International Cooperation.
311. In December 2021, a process of dissemination of the updated project of the RECEM VALLES Project was conducted. 5 workshops were held in different cities of the country: Tarija, Santa Cruz, Cochabamba, Carmago and Chuquisaca. These meetings were attended by local authorities, irrigation associations and farmers' associations representing indigenous peoples, in their capacity as representatives of the project's beneficiaries.
312. RECEM Valles has foreseen several mechanisms to achieve stakeholder engagement throughout project implementation in line with the GCF's Information Disclosure Policy and E&S Policy. The Steering Committee and the Technical Committee as well as the coordination platforms established with other key stakeholders have as one of their purposes to promote continuous and scheduled participation to ensure stakeholder engagement aligned with the GCF Information Disclosure Policy and E&S policies. Similar processes are planned with beneficiaries and local stakeholders, who through the irrigation

committees, technical platforms and working groups, among others established and defined for the project, will support this engagement process.

313. In addition, communication, advocacy, governance, inter-institutional relations and knowledge management strategies will support stakeholder involvement during the lifespan of the project and beyond.

G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)

314. A Gender Analysis has been carried out that provides an overview of existing gender inequalities in Bolivia, emphasizing assessing gender gaps in the agricultural and natural resource sectors. It further identifies gender-related issues relevant to the proposed project and examines potential gender mainstreaming opportunities to be implemented by the project. The assessment is based on key available statistical information, observations and stakeholder consultations made during field visits in the project areas.

315.

316. Bolivia has achieved substantial progress towards gender parity in education and access to labour market. According to the Gender Gap Index, Bolivia stands at 42nd place for 2020.[145] However, some indicators show persistent disparities between men and women and indigenous groups. The gender gap is widest for economic participation and access to equitable financial resources. In rural Bolivia, women and men have different roles, responsibilities regarding agricultural, and natural resource management. Both genders share some tasks, but women or men dominate other tasks. This results in unique gender-based knowledge, experiences with resource management and coping strategies.

317.

318. The project's objective is to mainstream gender equality and promote a gender transformative path to increase climate resilience. The project will target 30-50% participation by women in all activities and access to assets and financing. To assure that women have equitable access to project resources, services and activities, the following approach will be applied:

- Adopt a community-based human rights approach, which strongly depends on equal and meaningful participation both by men and women;
- Seek input regarding planning. implementation and priorities from women community leaders and partners who are respected locally, by government agencies and other partners;
- Plan activities to meet women's time availability, location restrictions, and specific priorities; and
- Organize women's groups and women-only activities, if necessary, to provide conditions conducive for women to participate, share their knowledge and learn more effectively. Experience demonstrates that this approach will strengthen women's involvement and expertise and enhance their confidence regarding their knowledge of agricultural and natural resource management options, build their leadership and decision-making capacity, and strengthen their willingness to contribute to public discussions.

319. A Gender Action Plan has been developed, which will be further enhanced during the project's implementation. The Gender Action Plan provides a time-bound framework to implement the project's activities and achieve the project's outputs, results and components in an equitable and gender-sensitive manner. It should further contribute to reducing climate change-induced social, economic and environmental vulnerabilities. The Gender Action Plan also provides gender-disaggregated targets, indicators and achievement against all project activities and outputs that contribute to the achievement of project results, component and impacts.

320.

321. The detailed Gender Assessment and Action Plan is provided in Annex 8.

G.3. Financial management and procurement (max. 500 words, approximately 1 page)

322. Financial control and procurement processes will be implemented as per FAO rules and regulations, which were certified as acceptable to the GCF in the FAO accreditation process. FAO has an Administrative Manual organized across various Chapters covering Finance, Human Resources, Travel and Procurement. The FAO Intranet provides access to this Manual and to other procedures, information and guidance via the “FAO Handbook”.

323. FAO has deployed an Oracle based ERP system the Global Resources Management System" (GRMS) to its worldwide offices, which provides all FAO employees, in all locations globally, with travel, human resource, procurement and finance functionalities. Using GRMS improves the flow of financial information, supports financial monitoring and reporting, increases transparency and visibility, and strengthens internal control. FAO maintains a chart of accounts which is used by the whole organization and that allows for a separation of income and expenditure by donor and project and support and provides a

[145] Gender Gap Index: http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

standardized coding structure that enables data to be recorded, classified and summarized to facilitate internal management and external reporting requirements.

324. Procurement and Letters of Agreement Services are managed under CSAP which provides policy and operational support to ensure the Organization procures goods, works and services based on "Best Value for Money" principles as embodied in the Manual Section 502 and for Letters of Agreement under Manual Section 507.

325. As mentioned in Section C.4. FAO as the Accredited Entity of the GCF will have overall responsibility for quality assurance and oversight of executing entities. In addition to this, FAO will be responsible for the financial execution of GCF funds according to FAO rules and regulations mainly contained and detailed in the FAO Handbook (including those referred to financial monitoring, audit and procurement).

326. During implementation, FAO will provide oversight and quality assurance in accordance with its policies and procedures. This may include monitoring missions, spot checks and participation at PSC meetings. The project will be subject to FAO's audit regime of FAO, including the external audit and internal audit functions.

327. FAO Bolivia's Country Representative or FAOR is responsible for financial monitoring and is supported by a management team comprised of a Program Assistant, Management Assistant, and a Strategic Operations Officer. Such team will interact and support the work of the PMU.

G.4. Disclosure of funding proposal

Note: The Information Disclosure Policy (IDP) provides that the GCF will apply a presumption in favour of disclosure for all information and documents relating to the GCF and its funding activities. Under the IDP, project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Information provided in confidence is one of the exceptions, but this exception should not be applied broadly to an entire document if the document contains specific, segregable portions that can be disclosed without prejudice or harm.

☒ No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

☐ With confidential information: The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence. Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above, if containing confidential information.

H. ANNEXES

H.1. Mandatory annexes

☒	Annex 1	NDA no-objection letter(s) **(template provided)**
☒	Annex 2	Feasibility study - and a market study, if applicable
☒	Annex 3	Economic and/or financial analyses in spreadsheet format
☒	Annex 4	Detailed budget plan **(template provided)**
☒	Annex 5	Implementation timetable including key project/programme milestones **(template provided)**
☒	Annex 6	E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3): **(ESS disclosure form provided)** ☐ Environmental and Social Impact Assessment (ESIA) or ☐ Environmental and Social Management Plan (ESMP) or ☐ Environmental and Social Management System (ESMS) ☐ Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, Indigenous People's Plan, Land Acquisition Plan, etc.)
☒	Annex 7	Summary of consultations and stakeholder engagement plan
☒	Annex 8	Gender assessment and project/programme-level action plan **(template provided)**
☒	Annex 9	Legal due diligence (regulation, taxation and insurance)
☒	Annex 10	Procurement plan **(template provided)**
☒	Annex 11	Monitoring and evaluation plan **(template provided)**
☒	Annex 12	AE fee request **(template provided)**
☒	Annex 13	Co-financing commitment letter, if applicable **(template provided)**
☐	Annex 14	Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule

H.2. Other annexes as applicable

☒	Annex 15	Evidence of internal approval **(template provided)**
☐	Annex 16	Map(s) indicating the location of proposed interventions
☐	Annex 17	Multi-country project/programme information **(template provided)**
☐	Annex 18	Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
☐	Annex 19	Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
☒	Annex 20	First level AML/CFT (KYC) assessment
☒	Annex 21	Operations manual (Operations and maintenance)
☒	Annex 22	Capacity Assessment
☒	Annex 23	Draft agreements

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

No-objection letter issued by the national designated authority(ies) or focal point(s)

ESTADO PLURINACIONAL DE
BOLIVIA
MINISTERIO DE
PLANIFICACIÓN DEL DESARROLLO

Av. Mariscal Santa Cruz N° 1092 Casilla
N° 12814
Central Piloto: (591) 50850019
Fax: (591-2) 2312641
contactanos@planificacion.gob.bo
www.planificacion.gob.bo

To: The Green Climate Fund ("GCF")

La Paz, 28 January 2022

Re: Funding proposal for the GCF by Food and Agriculture Organization of the United Nations regarding Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro – region of the Plurinational State of Bolivia (RECEM-Valles)

Dear Madam, Sir,

We refer to the project titled **Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro – region of the Plurinational State of Bolivia (RECEM-Valles)** in Plurinational State of Bolivia as included in the funding proposal submitted by Food and Agriculture Organization of the United Nations to us on 28 January 2022.

The undersigned is the duly authorized representative of Ministry of Development Planning, the National Designated Authority of Plurinational State of Bolivia.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the project as included in the funding proposal.

By communicating our no-objection, it is implied that:

(a) The government of Plurinational State of Bolivia has no-objection to the project as included in the funding proposal;
(b) The project as included in the funding proposal is in conformity with the national priorities, strategies and plans of Plurinational State of Bolivia;
(c) In accordance with the GCF's environmental and social safeguards, the project as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the project as included in the funding proposal has been duly followed.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

Carlos David Guachalla Terrazas
Viceminister of Planning and Coordination
National Designated Authority
Plurinational State of Bolivia

V°B°

Environmental and social safeguards report form pursuant to para. 17 of the IDP

Basic project or programme information	
Project or programme title	Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)
Existence of subproject(s) to be identified after GCF Board approval	Yes
Sector (public or private)	Public
Accredited entity	Food and Agriculture Organization of the United Nations (FAO)
Environmental and social safeguards (ESS) category	Category B
Location – specific location(s) of project or target country or location(s) of programme	Valles Macro-region of the Plurinational State of Bolivia (Chuquisaca, Cochabamba, Potosi, Santa Cruz, Tarija)
Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity's website	Tuesday, February 7, 2023
Language(s) of disclosure	English, Aymara, Quechua, and Spanish
Explanation on language	Aymara, Quechua, and Spanish are official languages of the Plurinational State of Bolivia, which are languages understandable to affected peoples/stakeholders.
Link to disclosure	English: http://www.fao.org/3/cc3994en/cc3994en.pdf Aymara: http://www.fao.org/3/cc3994ay/cc3994ay.pdf Quechua: http://www.fao.org/3/cc3994qu/cc3994qu.pdf Spanish: http://www.fao.org/3/cc3994es/cc3994es.pdf
Other link(s)	FAO disclosure portal (English, Aymara, Quechua, and Spanish): https://www.fao.org//environmental-social-standards/disclosure-portal/en/ FAO Representation in Bolivia website (English, Aymara, Quechua, and Spanish): https://www.fao.org/bolivia/noticias/detail-events/es/c/1630162/

Remarks	An ESIA consistent with the requirements for a Category B project is contained in the "Annex 6: Environmental and Social Management Framework (ESMF)".
Environmental and Social Management Plan (ESMP) (if applicable)	
Date of disclosure on accredited entity's website	Tuesday, February 7, 2023
Language(s) of disclosure	English, Aymara, Quechua, and Spanish
Explanation on language	Aymara, Quechua, and Spanish are official languages of the Plurinational State of Bolivia, which are languages understandable to affected peoples/stakeholders.
Link to disclosure	English: http://www.fao.org/3/cc3994en/cc3994en.pdf Aymara: http://www.fao.org/3/cc3994ay/cc3994ay.pdf Quechua: http://www.fao.org/3/cc3994qu/cc3994qu.pdf Spanish: http://www.fao.org/3/cc3994es/cc3994es.pdf
Other link(s)	FAO disclosure portal (English, Aymara, Quechua, and Spanish): https://www.fao.org//environmental-social-standards/disclosure-portal/en/ FAO Representation in Bolivia website (English, Aymara, Quechua, and Spanish): https://www.fao.org/bolivia/noticias/detail-events/es/c/1630162/
Remarks	An ESMP consistent with the requirements for a Category B project is contained in the "Annex 6: Environmental and Social Management Framework (ESMF)".
Environmental and Social Management (ESMS) (if applicable)	
Date of disclosure on accredited entity's website	N/A
Language(s) of disclosure	N/A
Explanation on language	N/A
Link to disclosure	N/A
Other link(s)	N/A
Remarks	N/A
Any other relevant ESS reports, e.g. Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF), Indigenous Peoples Plan (IPP), IPP Framework (if applicable)	
Description of report/disclosure on accredited entity's website	IPP Framework/ Tuesday, January 31, 2023
Language(s) of disclosure	English, Aymara, Quechua, and Spanish
Explanation on language	Aymara, Quechua, and Spanish are official languages of the Plurinational State of Bolivia, which are languages understandable to affected peoples/stakeholders.
Link to disclosure	English: http://www.fao.org/3/cc3994en/cc3994en.pdf

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Quechua:
http://www.fao.org/3/cc3994qu/cc3994qu.pdf

Spanish:
http://www.fao.org/3/cc3994es/cc3994es.pdf</td></tr>
<tr><td>Other link(s)</td><td>FAO disclosure portal (English, Aymara, Quechua, and Spanish):
https://www.fao.org//environmental-social-standards/disclosure-portal/en/

FAO Representation in Bolivia website (English, Aymara, Quechua, and Spanish):
https://www.fao.org/bolivia/noticias/detail-events/es/c/1630162/</td></tr>
<tr><td>Remarks</td><td>An IPP Framework consistent with the requirements for a Category B project is contained in the “Annex 6: Environmental and Social Management Framework (ESMF)”.</td></tr>
<tr><td colspan="2">Disclosure in locations convenient to affected peoples (stakeholders)</td></tr>
<tr><td>Date</td><td>Tuesday, February 7, 2023</td></tr>
<tr><td>Place</td><td>The hard copies will be made available in Aymara, Quechua, and Spanish in the following places:
<table>
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	Association of Municipalities of Santa Cruz (AMDECRUZ)	Address: Av. Omar Chávez Nº 1170, Primer Piso (frente a la Prefectura) Tel.: +591-3 3363297 – 3331339 E-mail: amdecruz@fam.bo
	Association of Municipalities of Potosí (AMDEPO)	Address: Calle Quijarro # 12, Piso 3, ambiente 3 "A", Edificio Cámara de Minería Tel.: +591-2 6230192 – 6123054 E-mail: amdepo@fam.bo

Date of Board meeting in which the FP is intended to be considered	
Date of accredited entity's Board meeting	N/A
Date of GCF's Board meeting	Monday, March 13, 2023

Note: This form was prepared by the accredited entity stated above.

Secretariat's assessment of FP202

Proposal name:	Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)
Accredited entity:	Food and Agriculture Organization of the United Nations (FAO)
Country/(ies):	Plurinational State of Bolivia
Project/programme size:	Medium

I. Overall assessment of the Secretariat

1. The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
The project is a scale-up of the Bolivian government's existing initiative Mi Riego to support expansion of its reach to the most vulnerable populations in the rural area. The project will ensure synergy with the long-term government programmes to incorporate the lessons learned from the project and expand project results and outcomes into national programmes with an emphasis on ecosystem-based adaptation approaches.	The project exit strategy relies on the government's continued and expanded support for replication in other regions and additional financing mechanisms for scaling up are to be provided during the project implementation. It is important to make sure that throughout the project implementation, the project activities attract and increase interest from the local financial sector.
The project will address the financial barriers for smallholder farmers who tend to have limited access to credit and financial services, including insurance, and consequently a lack of opportunity to enhance production. The project aims to support local financial mechanisms, strengthening of local and national financial institutions to address climate risks for agriculture and irrigation, support local water funds, and strengthen the role of governmental entities to channel public resources to forest restoration activities.	The project will promote dialogue and consensus-building processes through consultation and coordination of territorial platforms to achieve inclusive decision-making and design solutions and actions to be adopted. The project expects risks related to increased competition over land and water resource to be low as a result of the proposed participatory approach. Nevertheless, the project needs to ensure conflict sensitivity assessment is undertaken prior to implementing its activities to be able to strategically address local issues.
The project is based on a thorough understanding of the socioecological interlinkages and constraints. This enables an understanding of the complex links between people and resources at system and individual levels, as well as the outcomes of decisions about resource use, including outcomes related to improving climate resilience.	

2. The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum IX, titled "List of proposed conditions and recommendations".

II. Summary of the Secretariat's assessment

2.1 Project background

3. The Plurinational State of Bolivia (Bolivia) is a landlocked country located in western-central South America. The Los Valles Macro-region, the project site, is located on the eastern side of the Cordillera. The project intervention area covers multiple ecoregions: cloud forests, a mosaic of agro-ecosystems and agricultural lands; locations at altitudes ranging from 1,400 to 3,800 metres above sea level. While the project primarily targets the rural area in Los Valles, the macro-region covers important cities including Cochabamba, Tarija and Potosi which demand water and other resources from the different watersheds surrounding these cities.

4. As temperatures rise, native tree species are predicted to shift their geographical distribution towards cooler elevations. This upwards migration is therefore changing the composition of the mountain forests and as a result the water regulation capacity provided by these forests may also be compromised. These are not glacier watersheds, and most of the water supply comes from precipitation.

5. The climate vulnerability analysis conducted by the AE shows how temperature increase is projected in the macro-region, as well as an increased precipitation variability. For example, climate projections show an increase in precipitation in some regions, such as Cochabamba, La Paz and Tarija, but a decreasing precipitation trend in the Potosi region. These changes in temperature and precipitation may lead to delays in the onset of dry and wet seasons; modifying the agricultural calendar in Los Valles. Also, there is evidence that evapotranspiration has reduced in Los Valles, with implications for a sustained supply of water, affecting the basin's water balance.

6. In addition, the region has experienced an increased frequency and intensity of frosts and hail events in the winter season. Based on the climate vulnerability assessment, the municipalities under high and very high risk of frosts have been identified. In these areas, frosts are a recurrent phenomenon and can create losses of up to 50 per cent of the crop production. In recent years, frosts are occurring in unusual and new areas. Also, many municipalities in the project site are under high and very high risk of hail, including some inter-Andean valleys and headwaters. Hailstorms have become more frequent and unpredictable in the last 10 years.

7. The vulnerability of water systems and the agricultural sectors to climate change impacts is high, indicating that the crop and livestock sectors will be among the most affected, facing significant productivity and economic losses. Smallholder farmers are particularly vulnerable as their current crop yields are already very low. Poor land management and unsustainable land-use change exacerbate these impacts.

8. The AE has conducted hydrological assessment using the Water Evaluation and Planning (WEAP) model to demonstrate the attribution of climate change to the observed impacts. The model considers the main factors influencing the hydrological cycle. Changes in the water supply have been modeled considering changes in land use and land cover (2010-2020) for the climate of 1980-2015, which includes deforestation and burning coverages, amongst others. Changes in water demand have been studied considering evapotranspiration, population growth, and other factors. The greatest disaggregation possible was used with the available data: 61 hydrographic units within the Macro-region. The conclusion from these analyses is that the changes in discharge as modeled in the climate change scenarios can be mostly attributed to climate change and not to land use changes.

9. The AE has identified the technical barriers for the smallholder farmers as follows:

(a) Limited technical support to apply the appropriate technological know-how and innovation to adapt traditional agroecosystem management to increased climate variability;

(b) Lack of appropriate and efficient on-farm water management practices and infrastructure to adapt to climate change;

10. Additionally, financial barriers exist for smallholder farmers, including the following:

(a) Limited access to financing, including credit and insurance, to build resilience;

(b) Lack of support for marketing and selling opportunities for their agricultural produce;

11. Institutional barriers identified by the AE are as follows:

(a) Inter-institutional coordination taking place at regional level, without addressing the needs of smallholder farmers and producer associations;

(b) Local institutions lacking strong governance mechanisms for climate change and natural resources due to limited technical capacities; and

(c) Lack of integral and participatory micro-watershed management plans to guide climate resilient watershed restoration and conservation practices.

12. The overall goal of this five-year full adaptation project is to increase the resilience of smallholder farmers in Los Valles to climate change by implementing an integral ecosystem-based and micro-watershed management, which includes: (i) improving the capacity of small-scale farmers to manage their agroecosystems sustainably; (ii) on-farm, climate-proofed irrigation systems; (iii) participatory and integral watershed management to restore ecosystem functions, particularly water regulation and supply, reduction of erosion and disaster risk; and (iv) strengthening the corresponding governance and institutional capacities at local level to support climate risk management by smallholder farmers and their communities.

13. In terms of project design, the project is structured around four inter-related outcomes:

(a) Climate resilient agriculture for productivity increased;

(b) Climate proofed water management systems including supporting irrigation systems for increased water use efficiency;

(c) Restoration and conservation of forest ecosystem covering 17,500 hectares; and

(d) Stronger institutional and territorial governance for climate risk management and financial inclusion.

14. A locally-informed vulnerability analysis was conducted as part of project formulation, and a suite of interventions have been proposed based on the climate hazards and impacts identified. These measures respond to the exposure, sensitivity and adaptation capacity of smallholder farmers in Los Valles who are the final beneficiaries. In addition to the concrete interventions that will require upfront investment, the project also contemplates strengthening public institutions to diversify the supply of financial instruments. The socioeconomic and environment baseline analysis of the farmers' informs in detail the farmers and production systems typologies.

15. With regard to creating a dependency model, the critical role of social protection has been well proven for food and water security, where a multi-dimensional approach is based on: (i) equipping households with resources needed to overcome liquidity constraints and cope with market failures, shocks and stresses, including climate-related stressors, thus allowing them to reinvest in their livelihood activities and enable better decision-making and risk management where insurance and financial markets are not sufficiently available (Component 1); (ii) stimulating local economic development with positive feedback loops on poverty

reduction (Component 2); (iii) supporting sustainable management of natural resources to strengthen resilient livelihoods (Component 3).

16. This project proposal is based on a national flagship programme called Mi Riego, implemented since 2015 with public funding support, through the Ministerio de Medio Ambiente y Agua/Ministry of the Environment and Water (MMAyA) with external financing from organizations such as the Inter-American Development Bank (IADB) and the Development Bank of Latin America (CAF). The lessons learned and the gaps identified from the initiatives are taken into account in the design of the RECEM-Valles proposal. The lessons learned have shown the importance of having public investments in irrigation reaching the on-farm irrigation systems and following an integrated, ecosystem-based approach at basin level.

17. Lessons learned include:

(a) Not considering a watershed approach in new irrigation investments can reduce water availability;

(b) Investments in irrigation did not reach on-farm irrigation systems;

(c) The investments in irrigation must be in places where there is a willingness to organize around the irrigation systems; and

(d) These types of investment must consider those with easier mechanisms to maintain the irrigations systems[1].

18. In terms of financing, the project requests for GCF funding of USD 33.3 million in the form of grants with a co-financing of USD 30 million from the Government of Bolivia through MMAyA and the Federation of Municipalities.

19. In terms of implementation arrangements, the Food and Agriculture Organization (FAO) is the accredited entity (AE) and an executing entity (EE) for the GCF proceeds. The co-financiers are the Federation of Municipal Associations, which represents all of Bolivia's municipalities and plays a key role in watershed governance, and the Ministry of Environment and Water, both of which will undertake the role of co-executing entities.

2.2 Component-by-component analysis

Component 1: Strengthened food and income security in changing climate through climate resilient agricultural systems (total cost: USD 15.8 million; GCF cost: USD 15.8 million)

20. The component aims to develop and strengthen the capacity of smallholder farmers, including women and youth, to increase their agroecosystems' productivity and as a measure of adaptation to the variability of temperatures, rains and droughts. The component targets an increase in productivity and sustainability of at least 23,400 hectares of agroecosystems by the end of the project. Component 1 is structured in two main outputs or project results:

(a) Output 1.1. Climate resilient agriculture implemented and managed by smallholders to increase the productivity and sustainability of their agroecosystems; and

(b) Output 1.2. Increased market access to climate resilient agricultural products.

[1] The results of studies on irrigation projects in the 1990s (CIIR1, 1991), reported that the provision of Technical Assistance (TA) in the development and management of irrigation in the country was, in general, limited, partial or simply non-existent, because the projects had an exclusively technical approach focused on delivery of equipment, without taking into account the social nature and or cultural vision of irrigation. Those studies also observed that the successful technified irrigation projects are those with support managed by NGOs and/or foundations, which monitor the operation and maintenance in the medium term (5 years). A PROAGRO Sustainability and Self-management of irrigation study from 2020 shows that after 3 years, only 20% of the irrigation systems presented problems for continuity and sustainability.

Component 2: Smallholder water resources secured to reduce the risks from droughts and low rainfall (total cost: USD 28.9 million; GCF cost: USD 7.2 million)

21. The second component focuses on revitalizing and optimizing the existing irrigation systems for efficient water use, reduced risk of droughts due to the variability of temperatures, prolonged dry periods and scarce rainfall. The component targets an increase in the technicality and resilience of on-farm irrigation systems in at least 4,448 hectares of farmland by the end of the project.

Component 3: Restored and conserved micro-watersheds and ecosystem functions and services (total cost: USD 11.3 million; GCF cost: USD 4.7 million)

22. The third component aims to contribute to an improvement in the communities' water security to guarantee the sustainability of their climate resilient livelihoods, based on prioritizing micro-basins and the preservation and restoration of environmental functions using the participatory approach of comprehensive watershed management. By the end of the project, the component target is set at preserving or restoring the environmental functions of at least 17,510 hectares of project area through a micro-watershed approach.

Component 4: Enabling conditions created to implement and scale up climate resilient agroecological management, climate-informed integral micro-watershed management, and access to financial mechanisms (total cost: USD 4.3 million; GCF cost: USD 4.0 million)

23. The fourth component aims to strengthen public and community institutional capacities to manage climate risk by small farmers and communities. The component will facilitate one governance mechanism to be implemented for adaptation planning and local financial mobilization.

Project management (total cost: USD 3 million; GCF cost: 1.6 million)

24. The GCF portion of the project management cost is less than 5 per cent of the total requested GCF funding and is compliant with the GCF policy on fees.

2.2.1. Interrelationships between the four outcomes

25. While outcomes 1, 2 and 3 provide the necessary upfront investment to increase farmers' resilience through technical assistance and climate resilient technologies, outcome 4 will design and strengthen national and subnational existing, and mainly publicly-led, financial mechanisms for ensuring water and food security in the region and considering the region's climate change projections in terms of water availability and distribution. Outcome 4 generates the enabling environment that guarantees financial sustainability of the climate resilient practices and technologies implemented in the other three outcomes.

26. Interventions and concrete measures proposed under Component 1 are linked to specific hazards that overlap with the climate hazards addressed through interventions in Component 2.

27. These interventions are not newly introduced in Bolivia but are proven technologies that are ready for upscaling. They have been extensively studied and validated by the Bolivian Research Center for Farmers Development (CIPCA).

28. The proposed financial mechanisms will (i) ensure long-term financial sustainability via channelling financial flows for vulnerable and poor farmers for the maintenance of the climate resilient infrastructure and re-investments in climate resilient agricultural practices; and (ii) foster upscaling of the climate resilient project interventions.

29. Without at least acceptable levels of production stability at household level, which in turn can increase climate resilience, it would be difficult to leverage funds for continuous support of climate resilient agriculture, and therefore to ensure food and water security. The

best alternative would always be to restore natural ecosystems and to ensure a comprehensive understanding of the relationship between these ecosystems for water supply based on restored functions. This relates to socioecological behaviours, where practices promoted by the project are integrated into local development processes.

30. The project is based on a very good understanding of the socioecological interlinkages and constraints. This allows the possibility to explore the complex links between people and resources at the system and individual levels, as well as the outcomes of decisions about resource use, including outcomes related to climate resilience increase. Not only is it important to have an ecological understanding of how ecosystems behave and may respond to the climate change stressors, but this also needs to be complemented with the social aspect that tries to understand the processes, governance structures and institutional arrangements used to manage natural resources. The framework provides a way to study the feedback that occurs from these interactions and outcomes, as well as the possible effects of external or exogenous influences (from political shocks to climate change hazards).

31. Insurance: One of the key challenges in this region is that agricultural insurance is either not adopted due to low awareness or is not available in the areas of the project. Therefore, the project will provide technical assistance to smallholders not only on lending and savings but also on micro-insurance.

32. The project is also looking at covering partial premium subsidies for eligible beneficiaries, and will also therefore review specific activities, cost and co-financing options together with FAO. The long-term view is that the subsidy will be reduced gradually to enable farmers to transition to pay for insurance themselves; and to increase the insurance coverage for additional crops, including some forestry species.

33. Indexed Insurance: In Bolivia most smallholder farmers do not protect their investments in productive activities through either conventional indemnity-based agricultural insurance or innovative index-based insurance products due to the lack of an adequate insurance product to meet their needs.

34. The project will support the development and tailoring of an indexed insurance product for the targeted populations. A participatory index design approach will enable tailoring of the product together with farmers to suit their needs, establishing triggers for the insurance pay-out and windows of protection. It will raise awareness and improve vulnerable farmers' access to insurance products.

35. For these farmers, the insurance premiums would be initially subsidized by the project. The subsidy will be reduced gradually to enable farmers to transition to pay for insurance themselves. The project will also identify mechanisms that enable public/private financial contributions (such as fee reductions) to reduce premium costs.

36. This approach of index insurance will be discussed with the Agrarian Insurance Institute (INSA), in order to coordinate their approaches within the framework of the insurances that the institution handles in Bolivia. Currently there are two public-led insurance mechanisms: (i) the Pachamama Universal Insurance Program, that focuses on producers; and (ii) the Minka Agrarian Insurance Program, which focuses more on municipalities.

37. Local producers currently have problems with national agricultural insurance benefits because coverage is limited to specific crops. The idea of this activity is precisely to explore the economic and financial feasibility of expanding coverage.

38. Early warning systems: The role of the *Servicio Nacional de Meteorología e Hidrología de Bolivia* (SENAMHI) and Ministry of Rural Development and Land will be strengthened to ensure the generation and timely dissemination of locally adapted information on meteorological/weather and hydrological issues, as well as on hotspots and forest fires.

39. The information generated from the fourth output will be disseminated to smallholders for use in climate risk management, for example scheduling of crop planting and other agricultural activities; irrigation scheduling; risk reduction from forecasted extreme events; and watershed management and planning.

40. Capacity building: Technical assistance to rural farmers is commonly provided through municipal staff or rural development programmes at national level. This project proposes three different routes to continue strengthening capacities: (i) farmer field schools; (ii) water users' associations; and (iii) watershed committees. Peer-to-peer exchanges will be prioritized. FAO is currently supporting the Ministry of Rural Development and Lands to strengthen its operational and technical capacities to improve extension services at local level.

III. Assessment of performance against investment criteria

3.1 Impact potential *Scale: Medium to high*

41. The project will directly benefit 81,551 heads of households, which accounts for 0.7 per cent of the total population of the country and 5.5 per cent of the population in Valles macro region and includes 2,700 indigenous people. The number of indirect beneficiaries is estimated to reach 1,251,769, which accounts for 11 per cent of total national population and 57 per cent of the total macro region population.

42. The benefits for the direct beneficiaries will be:

(a) Improved water security for rainfed and on-farm climate-proofed irrigated agricultural production, reducing the impact of climate change hazards, and increasing their production. Motivation to adopt these practices will stem in part from the prospects of increased income through the creation of community and associative productive enterprises that encourage implementation of climate resilient agriculture and the access to local, national and international markets;

(b) Increased market access through certification to agroecological and/or organic products, as well as through the organization of, participation in and promotion of local and national markets for agroecological and/or organic products that will allow direct sales and access to new markets; and

(c) Improved access to sustained water resources, and the knowledge of good practices and technologies for climate resilient agriculture and consequently increasing their agricultural production.

43. A total of 17,510 hectares of natural resource areas will be brought under improved low emission and/or climate resilient management practices, and the project aims to establish 1,000 community reservoirs and 5,000 new family reservoirs to support water security and reduce risks from droughts and low rainfall.

3.2 Paradigm shift potential *Scale: Medium to high*

44. The project takes in lessons learned from the previous/existing initiatives in the country that are ready for scale-up. The project design takes into consideration both the lessons and the gaps identified to extend support to the most vulnerable people and communities. The project also has a strong knowledge management component to ensure knowledge-sharing.

45. The project will support governmental institutional building by supporting capacity building activities and development of institutional plans and tools, including seven territorial platforms strengthened, seven water use plans implemented, and development of an

information and long-term monitoring tool that will provide up to date information on various indicators, such as water resources and climatic and weather conditions. This tool will be an annex to the existing MMAyA portal and will be incorporated in the National Early Warning System.

46. The project will address financial barriers for the smallholder farmers who tend to have limited access to credit and financial services, including non-conventional insurance products, and consequently lack opportunity to enhance production. The project aims to establish financial mechanisms, including insurance; recommendations refer to the development of indexed agricultural insurance, based on information from weather stations on rainfall and air temperature, which will make it possible to foresee the potential occurrence of catastrophes and eliminate the need for field verification with adjusters, in addition to paying indemnity directly to the region's producers.

47. The project proposes different financing and risk-sharing alternatives, basically relying on existing public structures.

3.2.1. Strengthening the National Agrarian Insurance Institute

48. The project is expected to provide technical assistance to the National Agrarian Insurance Institute (INSA) to develop pilots applying new premium-sharing arrangements. INSA currently manages two insurance schemes (for smallholders and municipalities) and this proposal contemplates the review and expansion of these schemes, and leveraging existing public structures to the extent possible. To develop these pilots, INSA would require strengthened climate datasets and therefore the project will support the partnership through the National Climate Service.

49. Regarding micro-insurance schemes, local producers currently face challenges with national-led agricultural insurance benefits, partly because their coverage is limited to specific agricultural crops. The risk-indexed micro insurance being proposed would benefit the most vulnerable farmers in the region, and the benefit is expected to encourage small producers to make investments to support climate resilient agricultural activities that are the primary source of family income in the region (Outcome 1).

3.2.2. Green and concessional micro-credit lines

50. The project will work with local and national financial institutions, such as the Productive Development Bank (BDP)[2] to diversify the micro-credit portfolio for climate resilient agriculture and irrigation. In the case of FINRURAL (Association of Development Finance Institutions) and FONDESIF (Fund for the Development of the Financial System and Support for the Productive Sector), the project will support the design and implementation of credit lines with unconventional guarantees.

51. Green credits and concessional credit lines can be used to support the municipalities in implementing climate resilient irrigation systems, and to support the management and administration of water for irrigation at community level, as well as to climate proof the irrigation systems under Outcome 2.

3.2.3. Design and establishment of water funds

52. Two revolving water funds are under design in the project area: Tarija and Santa Cruz. These water funds will provide sustained funding for the restoration and conservation activities upstream. While the funds are expected to be structured as Payment for Ecosystem Services

[2] BDP is considering accreditation as a GCF Direct Access Entity for Bolivia and could potentially be a partner in support of the capacity strengthening efforts.

schemes, it is worth noting that Bolivia rejects any kind of commercial transaction for ecosystem services, therefore, the participation of private companies in water regulation services payment schemes is limited to the public water companies of the municipalities and the national Bolivian brewery company.

53. The GCF funding will support the Fondo Nacional de Desarrollo Forestal (Fonabosque) to elaborate a financial assistance plan with participation of the private sector and the banking sector to assess and then strengthen their technical capacities to allow Fonabosque, a public-led fund, to manage new and additional climate-related funding (Outcome 3).

3.3 Sustainable development potential *Scale: High*

54. The project expects 40,910 hectare of avoided deforestation and to reduce 78,000 tCO2eq over 20 years from improved crop and forest management. The AE has evaluated the impacts on green house gas emissions (GHG) from project interventions using Ex-Ante Carbon Balance Tool (EX-ACT). The risk of maladaptation is addressed through mitigating measures built in to the project design.

55. The proposal recognizes the important roles that women play in agriculture production systems in Bolivia, representing 42 per cent of the economically active population as well as managing 48 per cent of agricultural production systems. The proposal aims to remove barriers that women face in decision-making, training and credit and other services to increase access and support women's growing role in production.

56. The proposal will contribute to achieving the Sustainable Development Goals, including SDG1. *End of poverty* (Target 1.1, Target 1.4, Target 1.5); ODS 2. *Zero Hunger* (Target 2.1, Target 2.3, Target 2.4, Target 2.5); SDG 5. *Gender equality* (Target 5.5, Target 5.a); SDG 6. *Clean water and sanitation* (Target 6.4, Target 6.6); SDG 8. *Decent work and economic growth* (Target 8.2, Target 8.3, Target 8.6, Target 8.9); SDG 13. *Climate action* Target 13.2); SDG 15. *The life of terrestrial ecosystems* (Target 15.1, Target 15.2, Target 15.3, Target 15.4, Target 15.9).

3.4 Needs of the recipient *Scale: High*

57. A multicriteria analysis was used to identify and prioritize project beneficiaries and the intervention area, based on a climate vulnerability assessment (poverty, food insecurity). The area most vulnerable to hydrological drought was identified, including 2.3 million people, out of which 80 per cent dedicated to small-scale and subsistence farming.

58. Communities and small-scale farmers will apply climate resilient agricultural practices, based on the revitalization and expanded coverage of efficient irrigation systems, which will be complemented by comprehensive and sustainable water, soil and biomass management activities with the objective of optimizing water recharge and supply cycles, reducing erosion and risks, and minimizing agricultural disasters.

59. Local financial intermediation in Bolivia does not always consider credit lines with unconventional guarantees or specific credit conditions linked to climate risks. Financial services for smallholder farmers in rural Bolivia are limited. The main market barriers for the deployment of microfinance products for adaptation are: (i) the lack of knowledge and information on adequate adaptation measures; (ii) the need for adequate financing mechanisms in terms of maturity and interest rates both for the clients and the microfinance institution; (iii) microfinance institution risk perception of adaptation finance; and (iv) regulatory impacts of the new Financial Services Law if interest rates caps are established.

60. Some municipal governments have long experience of self-government but local administration is generally weak. Municipal governments have four main types of resources:

taxes, transfers, fees and property income, and loans. In terms of expenditure, municipal governments spend money on three main items: operating expenditures, debt service, and direct investments. Although it is true that municipal governments remain weak politically, administratively and financially they are well established and are trying to improve their performance so that there is a shift towards a well-functioning decentralization process.

61. If targets are met and the impacts are proven, the project could lead to increased beneficiary resilience, including fostering high value products, enabling access to markets, finance and insurance, early warning systems as well as institutional capacity-building and policy development.

62. The eligibility criteria for direct beneficiaries was designed to capture the diversity of smallholders in Los Valles macro-region. The eligibility criteria list is by no means expected to be understood as an exclusion list; but as a set of criteria to be refined in the Operations Manual during project implementation and based on the socio-environmental dynamism of the territories. The in-kind contribution (e.g., in the form of labor) made by the beneficiaries will be calculated, tracked, registered and verified by the FAO's National Monitoring Unit.

3.5 Country ownership *Scale: High*

63. The aim of RECEM-Valles is to contribute to the achievement of Bolivia's nationally determined contribution targets[3] including an increase in social participation for local water management, reduced water vulnerability, areas of ecosystem functions preserved and restored, and areas forested and reforested. The proposal was prepared in consultation with the NDA (Ministry of Planning), MMAyA, and the FAM, as well as key stakeholders through use of publication consultation platforms to identify and prioritize activities proposed.

64. The project is also in alignment with other relevant policies, including: Law No. 745 pledging a Decade of Irrigation 2015–2025; Plurinational Strategy for the Integral and Sustainable Management of Biodiversity – Action Plan 2019–2030; and Law No. 300, the Framework Law of Mother Earth and Integral Development for Living Well.

65. The Government of Bolivia, acting through MMAyA, and the Federation of Associations of Municipalities (FAM) will undertake the role of co-executing entities for the project.

3.6 Efficiency and effectiveness *Scale: Medium to high*

66. The project's cost per direct beneficiary for GCF funding is USD 408/beneficiary and USD 24.9/beneficiary for the total number of beneficiaries (direct and indirect beneficiaries). [Costs for agriculture and food security adaptation projects in Latin America and the Caribbean are however heterogenous and range from USD 15/beneficiary to USD 889/beneficiary.] This reflects the highly context-specific nature of adaptation projects.

67. The project has high economic returns. The project's economic net present value (ENPV) is positive and its economic internal rate of return (EIRR), including marketable and ecosystem benefits of 56 per cent, is above the social discount rate of 12.67 per cent. EIRR, including marketable benefits, only is -2 per cent.

68. The result of the AE's analysis is robust to sensitivity analysis. The sensitivity analysis tests for a one- and two-year delay in project benefits. Delays only result in negative ENPVs in the short run – five years. The ENPV and EIRR over a period of 10 years is still robust. Since the economic benefits of the project are expected to materialize over the medium and long term, the outcome of the sensitivity analysis is good.

[3] https://unfccc.int/NDCREG. Accessed on 13 July 2022.

69. To justify the need for concessionality, the AE performed a financial analysis including both a scenario using grants as a financing source, and an another using loans to compare the relative attractiveness of both options.

70. The results of this analysis depend on the component. For solar tents for example, the internal rates of return with and without the GCF loan is negative (here the assumption is made that concessional loans will reach the end beneficiary with an interest rate of 5 per cent and 5 years as a tenor). The use of grants to cover the initial investment is required. It is the same case for sustainable agroforestry, and thermal blankets. For the other components, the activities are profitable regardless of the type of financing. However, the AE provides additional evidence that suggests significant barriers to access finance in the Valles region.

71. The need for concessionality in the case of this project is not dictated by a lack of profitability of the intended interventions alone. Another market failure is the target communities' lack of access to finance for the interventions. According to the AE, the targeted region of Valles accounts for 55.2 per cent of the agricultural and livestock productive units (ALPU), however, 7 per cent of the total commercial credit granted to the agricultural and livestock sector in 2017. Private companies account for only 4 per cent of the ALPU in the Valles region with the rest being households. In terms of collateral requirements, 95.8 per cent of credit provided to ALPU requires collateral. Out of all the loans requested for ALPU purposes in 2017, 29.9 per cent were not granted, and specifically, 23.1 per cent were not granted because of lack of collateral.

72. Grants seem to be the financial tool that allows maximum flexibility and safeguards the project's ability to achieve the intended climate outcomes in this case.

73. Sustainability in the long run and potential to catalyse private investment is high for most of the profitable climate resilience interventions under this project. Overall, the project includes components that will address risk perception from private investors. Indeed, the AE mentions that the government's decision to cap microcredit interest rates at 13.5 per cent constrained the willingness of financial institutions to engage with vulnerable farmers. In addition, the adoption of agricultural insurance is only 3 per cent nationwide and less than 1 per cent in some areas of the Valles region. The project's components aiming at building innovative financial instruments and scaling up the use of agricultural insurance are expected to contribute to catalysing private investors. Capacity building activities of the project to engage variety of financial intermediaries are expected to strengthen the mainstreaming of climate in the agri-finance systems and adoption of climate resilient interventions in Bolivia.

IV. Assessment of consistency with GCF safeguards and policies

4.1 Environmental and social safeguards

74. **Overview.** The project is a climate adaptation investment aiming to enhance the resilience of livelihoods, ecosystems, infrastructure and food security in the Valles Macro-Region of Bolivia, to face the increasing hazards of climate change. The project activities are expected to contribute to environmental and social co-benefits, including an increase in soil carbon and enhancement of organic soil content due to adoption of climate-resilient agricultural practices. The forest restoration and revegetation will also contribute to enhance biodiversity and ecosystem services. The project is also expected to create opportunities for income generation that could alleviate the need for rural-urban migration.

75. **Environmental and social risk category.** The AE has screened the project against its social and environmental standards procedure and deemed it as having moderate environmental and social risk. This categorization is aligned with the GCF environmental and

social (E&S) risk categorization (equivalent to category B) and is within the E&S risk accreditation level of the AE. The project is designed around four interrelated outcomes with activities that may have potential limited adverse environmental and/or social risks and impacts that are generally site-specific, largely reversible, and can be readily addressed through mitigation measures such as through implementation of the project's selection criteria and social and environmental plans of action. The project will not have large scale or irreversible negative impacts as physical interventions on the ground are limited to small civil works. Ecological impacts are expected to be positive, although the possibility of minor ecological disturbance cannot be ruled out from the micro watershed and farming systems interventions.

76. **Safeguards instrument.** The AE has submitted an Environmental and Social Management Framework (ESMF). The framework approach is deemed appropriate for this project as the interventions will cover a wide region with diverse characteristics, and community/site-specific activities will still be identified and developed during project implementation. The framework will provide guidance to the project management and the communities in assessing and managing environmental and social impacts and risks of the community/site-specific project activities.

77. **Compliance with the GCF Environmental and Social Safeguards (ESS) standards.** The paragraphs below provide a brief description of the project's compliance with ESS standards.

78. **ESS1 (Assessment and Management of Environmental and Social Risks and Impacts)**. The ESMF includes a general assessment of the baseline environmental and social conditions of the project area, the expected impacts from the project activities and the proposed mitigation measures. More importantly, the ESMF sets out the procedures and requirements for assessing and managing environmental and social risks and impacts of community/site-specific activities. All proposed interventions under the project will be subject to an environmental and social screening and will go through an internal review and approval process at the sub-project levels before execution.

79. **ESS2 (Labour and Working Conditions)**. The project will not involve hiring of large numbers of workers. The implementation of new farming systems will be undertaken by the farm owners themselves who are expected to rely on family labour and occasional help from locally available wage labour. At the community levels, small scale civil works may be undertaken in the upgrading/rehabilitation of community irrigation schemes, construction of central sorting/processing facilities, or works to restore and protect watersheds. Beneficiaries are expected to contribute to the labour requirements. Workers for these small infrastructures are expected to come from within the host and neighbouring villages. The watershed management activities will be undertaken through a participatory approach and any civil work will mostly likely be undertaken by the members of the host communities themselves. The ESMF provides for strict avoidance of child labour in the project activities and has outlined measures to ensure that the policy will be enforced. The recruitment of project workers will also be conducted in accordance with the AE's standards. In addition, a grievance redress mechanism (GRM) for project-related, on-site workers/labourers will also be established.

80. **ESS3 (Resource Efficiency and Pollution Control)**. The project will not use large amounts of fuel, water, or raw materials for its activities. The irrigation upgrading is aimed at making irrigation more efficient and reducing the risks associated with drought. In terms of pollution, the project is not expected to generate significant amounts of pollutants during construction or during operation of project-built facilities. Small-scale civil works at communal irrigation systems and storage facilities may generate dust and noise causing nuisance to residents and farmers and temporary sedimentation of canals and streams. While there will be potential pollution from the use of agrochemicals in the farms supported by the project, the AE will apply its ESS5 (Pest and Pesticide Management) standard which, among others, will promote the adoption of integrated pest management among farmer beneficiaries.

81. **ESS4 (Community Health, Safety and Security)**. Risks and impacts on community health and safety are expected to be negligible during construction. However, interventions in the farming systems and micro watersheds may have impacts that may increase the risk to community health and safety. For instance, the interventions in the farming systems, water flow regimes in the irrigation system, and micro watersheds may disrupt the ecological balance of the area. The change could promote increased prevalence of certain disease vectors increasing the risk of outbreak of diseases. It could also alter vegetation in the areas making the area more susceptible to forest fires during drought season. Invasive species and pests may also emerge which could affect subsistence crops threatening the food supply of subsistence families. While the possibility of use of pesticides in the new farming systems could expose farmers and members of their families to the hazard of acute and chronic poisoning, the risk is expected to be low as the project will not support activities that violate the Pesticide Code of Conduct, and procurement and/or use of highly hazardous pesticides, or those that are not nationally validated or internationally regulated, will not be supported. Influx of non-resident workers into the communities will be mostly insignificant given the expected small-scale construction activities and the labour contribution of the beneficiaries. The long period of droughts in the target areas could potentially generate conflicts over access to water. The project intends to mitigate this through enhancing the existing inter-institutional governance structure and conservation of water resources and adoption of sustainable agricultural production systems in the region.

82. **ESS5 (Land Acquisition and Involuntary Resettlement)**. The project is not expected to result in any physical or economic displacement. The AE's Screening Checklist also assessed that the project will not "result in any changes to existing tenure rights (formal and informal) of individuals, communities or others to land, fishery and forest resources". The ESMF also has an Exclusion List which enumerates the activities that will not be pursued under the project. As per the list, the project will not fund any activities that result in "changes in land tenure or displacement (permanent or temporary) of people from their homes or places of work or subsistence, or restrict their access to them".

83. **ESS6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources)**. The project is designed to achieve positive outcomes but could have some unanticipated inadvertent negative impacts or risks to biodiversity, ecosystems, natural habitats, genetic resources, and pest and pesticide management. For instance, since the project would involve restoration and protection of watersheds and wetland areas and irrigation systems, these could have some impacts on the local water flow regimes. Changes in farming systems could also inadvertently create ecological imbalance, including invasive species, emergence of new pests and diseases. The new production system may also encourage increased use of pesticides. As part of its management measures, the project will exclude activities located in protected areas and their buffer zones and will adhere to Bolivian laws on protected areas and the environment. It will also exclude supporting land management practices that cause degradation (biological or physical) of the soil and water; use of genetically modified organisms, or the supply or use of modern biotechnologies or their products in crops; introduction of crops and varieties that previously did not grow in the implementation areas, including seed import/transfer; actions resulting in loss of biodiversity, alteration of the functioning of ecosystems, and introduction of new invasive alien species; activities that affect gene flows and biological corridors; and collection of wild genetic resources.

84. **GCF Indigenous Peoples Policy and ESS 7. Indigenous Peoples**. The area of project focus includes indigenous peoples in the Valles Macro-region of Bolivia. While the AE has noted there is no adverse risk to indigenous peoples, an Indigenous Peoples Plan (IPP) has been prepared as part of the annexes to the ESMF. A free, prior and informed consent process was conducted as part of the development of the IPP. The IPP identifies that consultation, consent, participation and monitoring processes must include the following indigenous peoples organizations: the Qhara, Chuwis, Chichas, Karangas and Charkas in the municipalities of

Poroma and San Lucas (Chuquisaca); Mizque and Aiquile (Cochabamba); and Tupiza, Cotagaita, Vitichi, Caiza D, Potosí, Tacobamba, Puna and Tinguipaya (Potosí). The AE also notes that information should be provided to CONAMAQ as the umbrella organization representing the indigenous highland peoples of Bolivia. The IPP contains baseline information on indigenous peoples concerned and their representatives, the potential impacts, risks and opportunities as well as measures to minimize the negative impacts and enhance positive impacts and opportunities. The IPP also highlights the results of the consultation process and includes the key agreements, terms of withdrawal and consent and GRMs. The IPP provides information on operational aspects including on budget and reporting. The project provides an opportunity to strengthen the leadership of indigenous peoples in climate action, including through their knowledge. To maximize the opportunities and, in line with their roles and functions, the GCF Indigenous Peoples Advisory Group is available to provide advice to the accredited entity and executing entities.

85. **ESS8 (Cultural Heritage)**. The project is not expected to affect any cultural heritage sites. Project activities in areas with cultural, historical, or transcendent values for individuals and communities have been included in the Negative List. Nevertheless, a Chance Find Procedure has been prepared in case of chance discovery of artifacts or archaeological sites during civil works.

86. **Sexual exploitation, sexual abuse, and sexual harassment (SEAH) safeguarding.** Awareness raising and prevention of gender-based violence (GBV) and SEAH is incorporated in the overall objective of the ESMF, and the AE has approached the project SEAH safeguarding through triggering the AE's E&S safeguard on gender equality and prevention of GBV. The ESMF identifies low probability but high impact GBV and SEAH risks to direct project workers and employees of contractors and subcontractors who may request sexual favours as a pre-requisite for the technologies provided by the project. Workers and other project stakeholders could be engaged in issuing threats, insults, assault and other forms of abuse on girls, women, children and other vulnerable groups, given the possible influx of workers from outside the community. SEAH risks for women can derive from their husbands and other male family members opposing their participation in the project, or from refusal to give up earnings to their husbands and/or other male family members. Girls who take care of household chores to free up their mothers to participate in the project may also be subject to GBV and SEAH incidents. The ESMF also identifies mitigation measures centred on developing a SEAH-GBV Action Plan during the project inception, sensitizing project workers and persons working or living in the immediate project area on GBV and SEAH; providing contact information of service providers to offices, schools and clinics within the project area; contractually requiring mandatory GBV training of the project workforce and compliance with relevant codes of conduct; and a communications strategy with specification of roles and responsibilities in the institutional arrangement of the project. As specific sub-activities will be identified during project implementation, the ESMF also establishes principles and procedures to mitigate GBV and SEAH risks and impacts, which will be screened and mitigated as part of the ESMP at sub-activity level. As part of the project-level grievance mechanism, SEAH and GBV grievances will be managed in an inclusive, survivor-centred and gender responsive approach, including confidential reporting and mandatory involvement of the FAO E&S and gender specialists in monitoring the process. In case of GBV, the reporting party will be immediately directed to the appropriate GBV referral pathway by the GRM personnel, and directed as necessary to medical care, psychosocial support, legal support, community-driven protection measures, and reintegration services.

87. **Implementation Arrangements.** The project will be directed at the highest level by a Project Steering Committee (PSC) composed of representatives from the AE and the EEs and other government agencies and supported by a Technical Committee. There will be a Project Management Unit (PMU) which will be responsible for overall coordination of the project activities. At the local levels, there will be Territorial Operating Units (TOUs) to coordinate activities directly with local stakeholders. The TOUs will have safeguards' specialists, as

appropriate, with a Lead Safeguards' Specialist at the PMU. The AE will be the overall responsible entity for project compliance with the ESMF and safeguards requirements.

88. **Stakeholder Engagement and Information Disclosure.** The project proposal has undergone various consultations and had received inputs and recommendations from various stakeholders. These consultations have been conducted at the concept stage, at the validation of the project concept note, and at formulation of the logical framework, and have involved representatives from local governments, small farmers, and non-government organizations. A stakeholder engagement document has been prepared, containing a summary of these consultations, and a stakeholder consultation and participation plan.

89. **Grievance Redress Mechanism**. The ESMF describes the project's Complaint and Grievance Mechanism. Complainants will have access to the AE's institutional grievance system which is handled by the FAO Office of the Inspector-General and a project-level grievance mechanism to be established at the field level. The key details of the project-level grievance mechanism have been discussed with the stakeholders during the previously conducted series of workshops. ESS specialists will also be responsible for implementing the project-level grievance mechanism. In line with the GCF Indigenous Peoples Policy, the GCF indigenous peoples focal point will also be available for assistance at any stage, including before a claim has been made.

4.2 Gender policy

90. The AE has provided a gender assessment and gender action plan (GAP) and therefore complies with the requirements of the GCF Updated Gender Policy.

91. Bolivia has enacted laws that promote gender equality, such as Law 243 against political harassment and violence against women. In addition articles in the political constitution of the state describe human rights, including those of specific groups such as women, for example, article 66 on gender equity in education. Bolivia is also a signatory to the Convention on the Elimination of All Forms of Discrimination against Women. The institutional framework for promoting gender equality in Bolivia consists of the plurinational service for women and dismantling patriarchy which was established by decree to monitor, follow up and evaluate the implementation of public policies aimed at promoting the effective exercise of women's rights. In addition, an Equal Rights Vice Ministry also exists for equal opportunities for women and men, age groups and disability. Challenges such as a lack of means and institutional capacity for policy implementation limit the execution of activities that promote gender equality particularly in rural areas.

92. The gender assessment is based on a desktop review of available information sources providing a general context of gender issues in Bolivia. Consultations with stakeholders that were undertaken in 2018 also provide a perspective on the gender issues of local communities in project locations. Additional consultations are planned prior to commencing implementation in order to update information from stakeholders who include local communities and producer associations. Priority needs of women and men in the context of the project are listed in the assessment based on inputs received during stakeholder consultations.

93. Social norms perpetuate the allocation of tasks according to gender such as care and domestic work which is almost entirely the role of women, many of whom are also household heads due to male migration from rural areas. This also puts an increasing number of women in charge of the traditionally male responsibilities in rural communities thereby increasing their workload. Time constraints are a significant barrier to promoting female participation in training and climate adaptation projects. At the same time, the effects of climate change are particularly detrimental to over 30 per cent of rural women heading households as they depend more on natural resources and agriculture. Women are the main food producers. In addition,

gender perceptions often mean that their interests and needs are not considered in decision-making on agricultural matters.

94. Responsibilities dominated by women are undervalued with men involved in more economically rewarding activities. Access to critical resources such as land is lower for women compared to men though progress has been made regarding increased land tenure for women due to land titling and a land reform law. Access to finance, technologies and training are challenges. For instance, in the municipalities where the project will be implemented access to finance is still limited for both women and men due to high interest rates and guarantees required. The gender assessment identifies entry points presented by the project to address vulnerabilities, needs and priorities of women and men.

95. There is a high prevalence of domestic violence in Bolivia directed towards women. It is on the rise and is due to persistent inequality and discrimination against women. Information on the grievance redress mechanisms that will be employed by the project is available in the project's documentation and awareness-raising will be undertaken on accessing the mechanisms.

96. The GAP contains activities, performance indicators and sex-disaggregated targets, timelines, responsibilities and costs included in the project's overall budget. Baseline information will be collected at the beginning of the implementation phase of the project and targets will be revised accordingly. Targets include smallholder producer associations led by women and female-headed households. The following activities reflect how the project will address issues raised in the assessment: provision of agricultural inputs; trainings and capacity-building on climate resilient agricultural practices, early warning systems, collection, processing, and marketing of agroecological products, along with a focus on those produced by women; access to water, including time-saving due to use of reservoirs and rainwater harvesting technologies established by the project; and access to information on monitoring of water resources. Furthermore, the project will also provide training to men on masculinities to foster co-responsibility in homes and avoid gender-based violence that may occur as women assume more productive roles, thereby improving the project's sustainability.

97. Implementation arrangements include having a gender specialist in the project management unit to support the execution of the GAP, reporting on gender mainstreaming actions and lessons learnt.

98. The Secretariat has three key recommendations for the AE: (i) improve its targeting of female-headed households given their high numbers, especially in rural areas, by including activities that can potentially reduce their vulnerabilities; (ii) in addition to monitoring the results of trainings on the use of water resources, the AE should monitor results by including qualitative indicators that reflect how access to this information has been useful to women and men; and (iii) given that the assessment identified access to finance as a barrier for women, the AE should specifically earmark a budget for women as beneficiaries under activity 4.2.1 and include related indicators and targets in the GAP.

4.3 Risks

4.3.1. Overall project assessment (medium risk)

99. GCF is requested to provide USD 33 million grant to invest in ecosystem services (such as water) and social ecological resilience (such as food security) in the Valles macro region of Bolivia. The Ministry of Environment and Water (MMAyA) and Federation of Municipalities (FAM) are providing an in-kind contribution equivalent to USD 29.5 million and USD 0.5million respectively.

4.3.2. Accredited entity/executing entity's capability to execute the current project (medium risk)

100. FAO will be acting as both AE and co-EE for the project. All GCF proceeds will be executed by FAO. FAO Bolivia has experience implementing mostly medium- size projects not only regarding budget size but also regarding programmatic and sensitive aspects. During the past five years, the average size of FAO Bolivia projects has been approximately USD 6 million annually. These projects were implemented under direct execution modality with different government counterparts and stakeholders.

101. MMAyA and FAM will be co-EEs for the project. They will be responsible for the implementation of funded activities by their co-financing resources only.

4.3.3. Project-specific execution risks (medium risk)

102. Misalignment of interest with financial institutions: activities under Component 4 aim to improve financial mechanisms that support climate resilient agricultural production and irrigation systems to mobilize increased finance for farmers by working with financial institutions. However, there is no co-financing from the financial institutions, therefore their interest is not aligned with GCF and they have a lack of incentives to roll out such mechanisms. The activity is based on the assumption that the financial partners are continuously willing to engage in the project and the enabling policy and legal framework will be present.

103. Willingness of the government: activities under Component 3 will require an endorsement at the municipal government level. Therefore, changes of the administration or government priorities may delay the process or the plans might not be endorsed. The AE also identified a change of the central and local authorities as one of the risks. Comfort can be derived from the government's commitment to the nationally determined contributions and other frameworks, and close collaboration between the AE and the government.

104. Project viability and concessionality: some of the funded activities may generate income such as collection of fees from the collection and marketing centres and voluntary contributions from farmers within the Irrigation Association. However, this income will be minimal, and the financial analysis shows that the project does not generate sufficient financial returns during the five-year implementation period. Therefore, the AE requests full grant support. On the other hand, the economic analysis results in positive NPV considering marketable and non-marketable benefits.

4.3.4. GCF portfolio concentration risk (low risk)

105. In case of approval, the impact of this proposal on the GCF portfolio concentration in terms of results areas and single proposal is not material.

4.3.5. Compliance risk (medium risk)

106. The beneficiary country, Bolivia, is not subject to United Nations Security Council (UNSC) restrictive measures. The AE has confirmed that project activities and its related counterparties do not pose significant risks with respect to UNSC sanctions. The AE, through its country office in Bolivia, will act as the sole EE for GCF-related proceeds while two government entities – the Ministry of Environment and Water and the Federation of Associations of Municipalities – will be responsible for project activities in relation to government-originated funds. The AE has assessed money laundering, terrorist financing, prohibited practices and sanctions related risks to be of low probability and high impact. Throughout the project, the AE will – as per its usual practice – implement a set of standard controls to manage fiduciary risks in the funded activity, inclusive of providing an avenue for reporting any irregularities which

may occur during the implementation. The Office of Risk Management and Compliance /Compliance (ORMC/Compliance) has conducted a review of the project in accordance with relevant GCF Board approved policies and does not find any material issue or deviation with respect to compliance issues. Based on available information for this funding proposal, the ORMC/Compliance Team have determined a risk rating of 'medium' and has no objection to this request proceeding to the next steps for processing.

4.3.6. Recommendation

107. It is recommended that the Board consider the above factors in its decision.

4.3.7. Recommended risk rating

Summary risk assessment	
Overall project/programme	Medium
Accredited entity/executing entity capability to implement the project/programme	Medium
Project-specific execution	Medium
GCF portfolio concentration	Low
Compliance	Medium

4.4 Fiduciary

108. FAO will serve as both accredited entity (AE) and executing entity (EE) (GCF proceeds) for this project. The Government of Bolivia, acting through the MMAyA, and the FAM will also be executing entities for the activities that are funded with their own resources.

109. In its role as AE, FAO will be responsible for the overall management of this project, including: (i) all aspects of project appraisal; (ii) administrative, financial, and technical oversight and supervision throughout project implementation; (iii) ensuring funds are effectively managed to deliver results and achieve objectives; (iv) ensuring the quality of project monitoring, as well as the timeliness and quality of reporting to GCF; and (v) project closure and evaluation. FAO will assume these responsibilities in accordance with the detailed provisions outlined in GCF policies as well as the accreditation master agreement (AMA) and funded activity agreement. To perform these AE functions, FAO will set up a FAO-GCF project supervision team comprising relevant staff from the FAO Country Office in Bolivia, the FAO Regional Office for Latin America and the Caribbean in Santiago (Chile), and FAO headquarters in Rome. The project supervision team will remain independent of the EE functions also performed by FAO.

110. FAO, in its role of EE, will manage GCF funds by verifying financial expenditures against budgets, making payments and providing technical and secretariat assistance to the Project Steering Committee and Technical Committee.

111. Accountability on the use of financial resources will be facilitated through the review of annual and biannual project reports, as well as through audit and monitoring reports. Financial control and procurement processes will be implemented as per FAO rules and regulations. The project will be subject to the audit regime of FAO, including the external audit and internal audit functions.

4.5 Results monitoring and reporting

112. As an adaptation initiative, the project aims at generating various adaptation results across multiple GCF result areas. It is expected that 81,551 direct beneficiaries and 1,251,769 indirect beneficiaries will receive adaptation benefits, which account for 0.7 per cent and 10.7 per cent of the total population of Bolivia respectively. The AE has provided a methodology for defining both direct and indirect beneficiaries in the separately attached feasibility study report.

113. The theory of change diagram adequately captures different levels of expected changes as well as logical linkages between them from the goal statement to the proposed activities. It is helpful that the theory of change diagram identifies co-benefits which can be achieved along the way towards climate results as well as capturing the causal relationship between outputs and co-benefits. As mitigation co-benefit, 78,000 tCO2e is identified to be sequestered from avoided deforestation. The barriers and risks that may hinder the achievement of these changes are identified and linked to pertinent activities which will tackle them accordingly.

114. The logical framework has been well designed in accordance with the GCF integrated results management framework (IRMF). The project is expected to have huge paradigm shift potential. It will contribute to three GCF adaptation result areas with four project outcomes and two co-benefits. IRMF indicators are selected to monitor and report the project results in respective GCF result areas, and baseline and targets (mid-term and final) for each indicator are set based on data available from credible sources. The AE was responsive and actively accommodated comments provided by the Secretariat, so relevant core and supplementary indicators have been added. It is worth noting that there is a need to estimate the particular number of adaptation beneficiary per each GCF adaptation result area. At the GCF outcome level of "Enabling environment", two GCF core indicators have been identified: institutional and knowledge generation, capture and learning. Given the relatively low or medium baseline of each indicator, the project is expected to build a comprehensive enabling environment at the national level.

115. The project has identified relevant project-specific indicators for project outcomes and outputs, and it is expected to enable strong monitoring and evaluation of the project. The indicators are assessed SMART[4] and have considered both qualitative and quantitative aspects of results. It is advantageous that the project will measure co-benefits with specific indicators: this will increase the level of understanding of the project and will give an opportunity for the Secretariat to capture non-climate results that are worth monitoring and reporting.

116. The implementation timetable (annex 5 of the funding proposal) clearly describes how and when project activities will be conducted, and key deliverables will be delivered. Annex 11 contains the monitoring and evaluation plan with indicative budget in compliance with the requirement from the GCF Evaluation Policy.

4.6 Legal assessment

117. The accreditation master agreement (the "AMA") was signed with the accredited entity on 8 June 2018, and it became effective on 4 October 2018.

118. The accredited entity has provided a legal opinion/certificate confirming that it has obtained all internal approvals and it has the capacity and authority to implement the project.

119. The proposed project will be implemented in the Plurinational State of Bolivia (Bolivia), a country in which GCF is not provided with privileges and immunities. This means that, among other things, GCF is not protected against litigation or expropriation in this country, which risks need to be further assessed. The GCF Secretariat submitted the first draft of the privileges and immunities agreement to the national designated authority of Bolivia on 28 April 2016. The

[4] Specific, measurable, attainable, relevant and time-bound.

draft agreement is currently under negotiation. The latest communication in that regard was sent by the GCF Secretariat to the national designated authority of Bolivia on 2 December 2020.

120. The Heads of the Independent Redress Mechanism and Independent Integrity Unit have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by GCF are made only after GCF has obtained satisfactory protection against litigation and expropriation in the country, or has been provided with appropriate privileges and immunities.

4.7 List of proposed conditions (including legal)

121. In order to mitigate risk, it is recommended that any approval by the Board is made subject to the following conditions:

(a) Signature of the funded activity agreement in a form and substance satisfactory to the GCF Secretariat within 180 days from the date of Board approval; and

(b) Completion of the legal due diligence to the satisfaction of the GCF Secretariat.

Independent Technical Advisory Panel's assessment of FP202

Proposal name:	Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)
Accredited entity:	Food and Agriculture Organization of the United Nations (FAO)
Country/(ies):	Plurinational State of Bolivia
Project/programme size:	Medium

I. Assessment of the independent Technical Advisory Panel (based on the resubmitted funding proposal dated 12 December 2022)

1.1 Impact potential *Scale: High*

1. **Background**. The project "Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia" (RECEM-Valles) is a climate adaptation investment aiming to enhance the resilience of the agroecosystem. It targets farmers, their communities and livelihoods (from crops to processed food products) linked along the agribusiness value chain (from production to post-production and markets); ecosystems (i.e. water, forests, land, soil); built infrastructure (including water irrigation); and food security in the Valles Macro-region of the Plurinational State of Bolivia. The project is intended to address the impacts of climate change and variability (changes in temperature and precipitation) and extreme weather events (drought, hail, floods), which are exacerbated by human development challenges. The project targets 81,551 direct beneficiaries and 1,251,769 indirect beneficiaries (of which 48 per cent are women and 2,800 are indigenous peoples), 23,400 agroecological management areas, 4,448 hectares (ha) of agricultural land, 17,510 ha of prioritized micro-watershed areas. The total project cost is USD 63.3 million with GCF contributions amounting to USD 33.3 million worth in grant equivalent terms, and co-financing from the Ministry of Environment and Water (Ministerio de Medio Ambiente y Agua (MMAyA)) of USD 29.5 million[1] and the Federation of Municipalities (FAM) of USD 0.5 million. The project will be implemented over 5 years with a 10-year lifetime. The GCF proceeds will be administered by the Food and Agriculture Organization of the United Nations (FAO) as the accredited entity (AE) responsible for the overall quality assurance and oversight of the project. FAO is the sole executing entity for all GCF-funded project activities. The Government of the Plurinational State of Bolivia, acting through MMAyA, and FAM, will be executing entities, exclusively responsible for the implementation of activities funded from their co-financing resources.

2. **Project area description**. The project is located in the Valles Macro-region, which consists of 65 municipalities covering an area of 83,380 km^2 situated at an altitudinal gradient ranging from 800 to 3,500 m above sea level. The total population is 2,328,741 and the population density in the project area is 27 inhabitants per km^2. The Valles Macro-region

[1] See the co-finance letter from the Ministro de Medio Ambiente y Agua contained in annex 13 to the funding proposal.

contains 111 municipalities covering 13,107,900 ha. Biogeographically, these municipalities are located in the departments of La Paz (10), Cochabamba (39), Santa Cruz (11), Potosí (21), Chuquisaca (24) and Tarija (6). The funding proposal claims that the area is highly vulnerable to climate change.

3. The national poverty rate is 55 per cent while in rural areas, it is 31 per cent[2] and is concentrated in the project target areas of Altiplano and Valles, where the poverty rate is approximately 63 per cent. Poverty can be attributed to poor access to land and services, both social and productive, and to the marginalization of women in organizations and restrictions on women's activities outside the home.

4. Women continue to have less access to decision-making, training and other services, despite their growing role in agricultural production;[3] women manage at least 48 per cent of agricultural production systems and represent approximately 42 per cent of the economically active population in agriculture in the Plurinational State of Bolivia.

5. In 2019, agriculture employed at least 29 per cent of the labour force and contributed 15.3 per cent to the national gross domestic product.[4] About 11 per cent of the surface area of the Plurinational State of Bolivia is dedicated to irrigated agriculture, and around 60 per cent of the country's agricultural land area is located in the Valles Macro-region. The Valles Macro-region is characterized by subsistence farming; farm plots of over 2 ha or less (with irrigated plots even smaller at 0.4 to 1.5 ha) are typically managed by a family of four to five people, and planted with key crops (i.e. potatoes, maize and vegetables) and other complementary crops (e.g. beans, chili peppers, peanuts and fruit trees, especially stone fruits), depending on the altitude of the land. Smaller farms are usually irrigated farms and are often characterized as low-productivity agricultural systems;[5] however, the irrigated farms are responsible for 60 per cent of food production in the Plurinational State of Bolivia.[6] Presently, 161,982 ha in the Valles Macro-region is irrigated land while 86,740 ha is unirrigated; 40 per cent of existing irrigation systems are rainfed irrigation systems and thus available only during the rainy season. The region has 287 dams (30 in Chuquisaca, 115 in Cochabamba, 30 in La Paz, 9 in Oruro, 85 in Potosi', 9 in Santa Cruz and 9 in Tarija). With the dry season extending up to eight months, agriculture and livelihoods are quite vulnerable to climate conditions. The AE claims that this complex set of interactions involving the timing and volume of water, patterns and location of precipitation and agricultural seasonality make agriculture in the Valles Macro-region more vulnerable to the impacts of climate change.

6. Agricultural systems rely mostly on ecosystem functions and services, in particular hydrological services for the irrigation of the farms; these ecosystems, which include wetlands, puna grassland and forests, supply water not only to local communities but also to dry areas in the Valles Macro-region.[7] Forests, the largest portion of the ecosystem, cover 38 per cent of the project area and are critical to hydrological regulation and provisioning, water infiltration, climate regulation and prevention of soil erosion, flooding and drought. The Amazonian, Yungas and Tucumano-Boliviano forests, located at the north-east and east of the Valles Macro-region, have the largest forestry potential and are thus priority areas for conservation to ensure the continued supply of ecosystem services important for hydrological resources.

[2] Instituto Nacional de Estadística. 2015.
[3] Plan del Sector Agropecuario y Rural con Desarrollo Integral para Vivir Bien 2016-2020 (PSARDI). 2016.
[4] Insituto Nacional de Estatistica. 2020. Boletin sectorial agropecuario 2020.
[5] Agua Sustentable. 2018. Análisis Socioeconómico de la Macro-región Valles. Ibid, (L. Aguilar Revelo, La igualdad de género ante el cambio climático: ¿qué pueden hacer los mecanismos para el adelanto de las mujeres de América Latina y el Caribe?, serie *Asuntos de Género*, N° 159 (LC/TS.2021/79), Santiago, Comisión Económica para América Latina y el Caribe (CEPAL), 2021.
[6] MMAyA. 2017. Programación Plurianual y Marco de Evaluación de Desempeño del Subsector de Riego 2017–2020.
[7] Célleri, R. and Feyen, J. 2009. The hydrology of tropical Andean ecosystems: importance, knowledge status, and perspectives. *Mountain Research and Development*. 29: pp. 350–355.

7. Agricultural products are mostly sold at local markets. Farmers sell on the streets and/or directly at local community fairs (in peri-urban areas via mobile food, fruit or vegetable crop trucks) and municipal markets, or indirectly through traders or aggregators for wholesale supply to other retailers (supermarkets), especially for more organized groups of farmers. Farm to market locations are often far away from the farms and connected by roads in poor condition, and thus relatively costly to the farmers.

8. **Target farmer beneficiaries**. A total of 81,551 farmers, known as heads of agricultural production units, will be identified and selected, with women given priority.[8] The project targets most climate-vulnerable smallholder farmers: small-scale family farmers owning 0.5 ha titled land (as certified by the National Institute of Agrarian Reform), relying mainly on agriculture and producing cash crops for their own consumption and for market (e.g. maize, vegetables, potatoes, wheat), depending on family labour (at least four to five family members), with limited access to resources (e.g. money, skills, knowledge, farm tools and equipment) and relying on natural resources (e.g. water, forest). The funding proposal indicates that these farmers are at great risk of being pushed into conditions of extreme food insecurity as a result of climate change (all of those in conditions of poverty or extreme poverty fall into this group). Smallholder farmers in the Valles Macro-region have weak adaptive capacities. They have limited access to financial services (e.g. formal credit), constrained income generation from agricultural activities due to poor crop production, limited access to agrimarkets owing to minimum standards on volume and quality, high farming-related costs (e.g. transportation) and few skills and no access to modern technologies; all these factors combined inhibit the smallholder farmers' capacity to invest in the technologies and inputs they need to plan for anticipatory action to increase their resilience to climate change and reduce food insecurity and poverty.

9. **Impacts of current and projected climate change**. As per the funding proposal, the Plurinational State of Bolivia is highly vulnerable to the effects of climate change, such as the increase in extreme events, which are affecting watersheds (hydrological drought, frost, hail), with the negative ecological, economic and social impacts expected to be exacerbated. The country is already experiencing a range of climate change-related impacts, including an increase in the national average temperature of 0.10 °C per decade from 1939 to 2009 and a rate of increase of 0.32 °C to 0.34 °C in the last 25 years.[9] The country is also experiencing rainfall variability and has observed a decreasing trend in average annual rainfall. The funding proposal indicates that climate change will continue to degrade areas of the Plurinational State of Bolivia's territory and inhibit growth in key sectors of the economy, particularly agriculture. Climate change scenarios (Representative Concentration Pathway (RCP) 4.5 and RCP 8.5) for 2050 in the Valles Macro-region project an increase in temperature from +2.7 °C to +3.4 °C. This change will drastically affect the availability of water in quantity and quality, due to greater moisture loss through evaporation from soils and transpiration of vegetation.[10]

10. The Plurinational State of Bolivia is facing several development challenges owing to a combination of climate and anthropological causes exacerbated by climate change. Slash and burn techniques in the forest region has led to the deforestation of 48,000 ha from 2000 to 2015. The country is highly vulnerable to the current impacts of climate change and variability and extreme weather events, and the projected climate changes are expected to adversely impact the farmers' water, irrigation facilities, watershed resources, land, soil, crops, harvests, livelihoods and survival. The farmers have weak adaptive capacities in terms of resources (finance, equipment, advice, skills) and the poor farmers are not given a fighting chance to face

[8] See, annex 4, FS methodology_beneficiaries, paragraph 4 of B.34 funding proposal, annex 2, Feasibility Study.
[9] Government of the Plurinational State of Bolivia. 2020. Third national climate change communication to the United Nations Framework Convention on Climate Change.
[10] Fundación Amigos de la Naturaleza. 2018. Estudio de la Línea Base Ambiental de la Macro-región Valles. Santa Cruz: FAN.

these challenges. The weaknesses or barriers to development are mainly sociotechnical and organizational in nature rather than being purely economic or technical, reflecting the complexities of climate change.[11]

11. **Development barriers**. Among the barriers identified are (i) limited technical support for smallholder farmers in applying the appropriate technical know-how and innovation to adapt traditional agroecosystems to increasing climatic variability; (ii) lack of support for smallholder farmers in marketing, opportunities to sell their agricultural produce and opportunities to participate in other stages of the agricultural value chain; (iii) lack of appropriate and efficient on-farm water management practices and infrastructure to adapt to climate change; (iv) limited access of smallholder farmers to financing to build resilience; (v) inter-institutional coordination taking place at the regional level, without addressing the needs of smallholder farmers and producer associations; (vi) lack of systematic and long-term monitoring and evaluation processes, climate data and best practices in adaptation; (vii) lack of integral and participatory micro-watershed management skills and planning coordination to guide climate-resilient watershed restoration and conservation practices; and (viii) local institutions' lack of strong governance mechanisms for climate change and natural resources due to technical and coordination constraints.

12. **Summary of development problem**. The above-mentioned narratives described in the funding proposal show that the Valles Macro-region, along with its peoples, communities, ecosystem resources, built infrastructures, both soft (finance, markets) and hard (water, irrigations), livelihoods and investments, is highly vulnerable to climate change, climate variability and extreme events due to its very high exposure and sensitivity and very low adaptive capacity. This is particularly acute because of the semi-arid climate of the Valles Macro-region and limited availability of water resources during the dry season. This represents a high socioecological risk considering that in 2019, agriculture consumed approximately 80 per cent of all available fresh water supplies, employing more than 29 per cent of the labour force, 15.3 per cent of the national gross domestic product and producing more than 90 per cent of the country's food supply.[12]

13. **RECEM-Valles project (funding proposal)**. The funding proposal seeks the transformation of the Plurinational State of Bolivia in line with the country's nationally determined contributions (NDCs) and as envisioned in the implementation of the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth; this could be done via increasing the climate resilience of smallholder farmers through transformed land management practices, enhanced climate-resilient ecosystems and strengthened governance capacity. As expressed in the funding proposal's theory of change, "IF vulnerable smallholder farmers in the Valles Macro-region of Bolivia implement improved climate-adapted agricultural and water management practices, THEN it will contribute to the implementation of the Joint Mechanism for Adaptation and Mitigation (JMAM) as a transformative initiative in Bolivia BECAUSE climate resilience of smallholder farmers can be increased by transformed land management practices, enhanced climate resilient ecosystems and strengthened governance capacity."

14. The funding proposal has four project components: 1: strengthened food and income security in a changing climate through climate-resilient agricultural systems; 2: smallholder water resources secured to reduce the risks from droughts and low rainfall; 3: restored and conserved micro-watersheds and ecosystem functions and services; and 4: enabling conditions created to implement and upscale climate-resilient agroecological management, climate-informed integral micro-watershed management and access to financial mechanisms.

[11] Funding proposal, paragraph 67.
[12] Instituto Nacional de Estatistica. 2020. Boletín sectorial agropecuario 2020.

15. Component 1 of the project focuses on climate resilient agriculture implemented and managed by farmers for increasing the productivity and resilience of their agroecosystems. The resilient agroecological management will enable farmers to adapt to the main climate risks the project seeks to overcome: the increase in average temperatures and decreasing trend in rainfall. These practices include a shift to producing crops with greater resilience to higher temperatures and drier conditions. This component is also based on supporting farmers with the marketing of their products and diversification of their agriculture-based income streams.

16. Component 2 complements Component 1, in promoting activities which seek to increase the resilience of the farmers. Component 2 focuses on efficient water usage (reducing the water losses through inefficient irrigation systems). Activities promoted under Component 2 include (but are not limited to), harvesting rainwater and improving the household irrigation systems with drip irrigation. Activities under Component 2 will contribute to the modernization and revitalization of existing irrigation systems, increasing their resilience to climate variability and reducing the risks associated with droughts and periods of low rainfall. Systems promoted under Component 2 include the implementation of technological innovation irrigation water management systems such as rainwater harvesting systems, family and community irrigation and micro-irrigation systems, drip irrigation, construction of water harvesting reservoirs, among others. These climate resilient practices are consistent with the results of the hydrological modelling (see funding proposal paragraph 41 onwards), which identifies the areas with water deficit. The irrigation practices under activity 2.1.3 are only intended for those regions where there exists no water deficit, and there is sufficient surface water that allows farmers to connect to the existing larger irrigation networks.

17. Component 3 seeks to ensure that the water resources can be restored and conserved, ensuring availability not only for the water users within the project (especially linked to Component 2) but also for the ecosystem functions. Component 3 seeks to ensure the sustainable management of the water basins to better enable the irrigation demands as implemented in Component 2.

18. Component 4 aims at institutional strengthening and enhanced access to climate finance to sustain and strengthen the Components 1, 2 and 3.

1.1.1. Adaptation impacts

19. As an integrated and holistic approach in increasing the resilience of smallholder farmers, water and irrigation facilities, water and watershed resources, agricultural livelihood and business value chains, the RECEM-Valles project components are essentially win-win or ‘no regrets’ solutions, if implemented correctly.

20. The multipronged approach of the activities and outputs, as presented in the funding proposal and implementation plans, has a good and reasonable flow, with one activity synergistically building on the success of another. The first set of combinations of key activities can be described as a focus on increasing the farmers’ absorptive capacities to withstand the physical impacts of climate change via the provision of climate-proofing equipment (i.e. thermal blankets, solar tents, hail nets, hydrogels) (output 1.1). The project in parallel also focuses on increasing the adaptive capacities of (i) farmers through the acquisition of new/upgraded skills and training on climate-smart agriculture (e.g. crop diversification; outputs 1.2 and 2.2) and the use of climate-smart technologies (e.g. drip irrigation) and information (e.g. agroclimatological advisory services); and (ii) water and irrigation facilities via upgrading water tanks, reservoirs and irrigation systems (output 2.1). Most important of all, the project further strengthens the transformative capacities of farmers, agriecosystems and business value chains; these resilience measures range from the capacity-building on skills and training (e.g. farmer field school tuition on agribusiness, finance and markets), the establishment of climate-smart production facilities (e.g. cold chain logistics, agribusiness centres), the provision of business advisory services (e.g.

organic certification, incubation of community productive ventures, beekeeping business diversification, facilitating agriculture loans), to institutionalizing governance measures for a sustainable agroecosystem (e.g. mainstreaming climate in operation and maintenance (O&M) plans, developing climate-smart agrifinance products and services such as green credit, parametric insurance) (output 4.2).

21. If the project is implemented correctly, it is expected to directly benefit 81,551 heads of household (0.7 per cent of the total population of the country and 5.5 per cent of the population of the Valles Macro-region), including 2,800 indigenous peoples; it will impact 1,251,769 indirect beneficiaries (10.7 per cent of the total national population and 53.7 per cent of the total macro-region population). It will enhance the resilience of 23,400 agroecological management areas, 4,448 ha agricultural lands and 17,510 ha prioritized micro-watershed areas.

1.1.2. Risks to adaptation

22. In the previous submission of the funding proposal at the thirty-fourth meeting of the Board (B.34), the independent Technical Advisory Panel (independent TAP) raised the issue that if the proposed project is not implemented correctly in its totality, there were potential unintended consequences that may lead to maladaptation, thus undermining the overall impact of the funding proposal's intended outcomes. These identified issues[13] were as follows: (i) risk of increased emissions resulting from the increased economic activities as the funding proposal lacked greenhouse gas (GHG) assessment; (ii) risk of farmer exclusion due to an inadequate selection criterion; (iii) risk of ineffective financial products, services and development of innovative finance products (output 4.2); (iv) limited private sector participation (output 4.2); (v) limited government institutional stakeholders; (vi) ineffective selected adaptation and resilience measures for farmers and agroecosystems due to lack of a more in-depth assessment of a farmer's socioecological situation; (vii) missing focus on farmers' health and productivity; and (viii) weak baseline assessment on agroecosystem resources due to weak demonstration of how the interplay of climatic and non-climatic factors impacts the agroecosystem (i.e. forests and water).

23. Following the request to the AE for clarification and discussion with the independent TAP, FAO, in several written responses and online discussions, has adequately addressed the abovementioned issues and submits this new funding proposal for B.35.

24. Risk of increased GHG emissions: in the previous submission of the funding proposal to B.34, the independent TAP raised this issue. The funding proposal's interventions would naturally lead to an increase in economic activity. The potential risk of increased GHG emissions may come from the expansion of water ponds and canals for irrigation areas; a combination of stagnant water and heavy siltation could lead to methane emissions. The increased use of electricity (e.g. water pumps, lighting, processing agriproducts, heating, cooling and freezing) would surely increase carbon dioxide (CO_2) emission intensity (tonne of carbon dioxide/kilowatt-hour (CO_2/kWh)), depending on the source of power. The increased use of vehicles and equipment to transport farm inputs and crops to and from the markets would also lead to an increase in the carbon footprint of cargo per tonne-kilometre and people per passenger-kilometre. Waste products from agricultural production and processing could either be burned or left to rot as waste, thus creating another source of GHG emissions. The risk of forests being cleared to expand new agricultural lands owing to the availability of water and increased economic activities may also lead to carbon emissions. Whether the risk of increased GHG emissions was significant or material depended on the business-as-usual (BAU) baseline for the targeted project area; without this baseline assessment, it was difficult to determine

[13] FAO Bolivia funding proposal for B.34.

whether or not the proposed activities would be potential sources of GHG emissions, and whether or not the planned agroforestry and/or watershed restoration (e.g. reforestation) activities would be enough to sequester and store carbon to offset the project's emissions. Thus there was a need for an appropriate GHG assessment of the relevant agroecosystems and agribusiness value chains from production to the markets, taking into consideration that the funding proposal was also looking at increasing the resilience of the whole agroecosystem, and across the agribusiness value chains. The non-assessment of GHG emissions presented the risk of maladaptation (i.e. increased emissions due to the project). As cited in the term sheet, annex 3, "Exclusion List of the RECEM-Valles Project", this situation could trigger an exclusion criteria for the project if a component were likely to lead to a significant increase in GHG emissions.

25. When the independent TAP asked the AE to clarify this risk during the first submission for B.34, the AE responded that "a detailed GHG emissions assessment has not been performed, but the project interventions are assumed not to lead to increased GHG emissions, on the contrary, the project interventions aim to lead to restored ecosystems that are characterized by healthy soils, reduced emissions and increased GHG sequestration availability of water."[14] The AE further added that "the cold chain interventions will reduce the release of methane from wasted produce that is sent to landfill. These emission reductions would be balanced against increased GHG emissions from energy consumption and potential refrigerant leakage … and that BAU cold chains appear to be approximately neutral in terms of their climate impact. The project will facilitate the installation of cold chain equipment that represents best practice technology in terms of energy efficiency and use of low-GHG refrigerants. The refrigeration equipment will not use HFCs [hydrofluorocarbons]. The national GHG monitoring will contribute to monitor GHG emissions."

26. With the funding proposal resubmission for B.35, FAO addresses this issue. An EX-ACT analysis[15] was conducted that includes emissions and reductions related to key elements of the value chains supported by the project including: cropland, inputs and construction of agricultural structures and energy use, inputs and construction of irrigation and rainwater harvesting structures, emissions from water collection structures, transport to market, refrigerant leakage, and forest management. The evaluation assessed emissions compared to the BAU scenario for all relevant project activities. The detailed results obtained with EX-ACT can de disaggregated by components each reflecting a different activity (see EX-ACT calculation appendix 6 to the feasibility study). The component regarding activities 1.1.2, 1.2.1, and 2.2.1 appears in the cropland module, in the section on annuals. Given the computation of data (detailed in "Computation of data" in EX-ACT), the total carbon balance over 20 years of this activity is equal to -162,944 t CO_2 eq. This result is the net difference between the carbon balance from the baseline scenario (237,032 t CO_2 eq) and the carbon balance of the "with project" scenario (74,089 t CO_2 eq). The introduction of conservation agriculture practices (reduced tillage), and residue management are the main improvements; irrigation and manure application are also considered. The project foresees the implementation of activities that are net emitters, such as the construction of rainwater harvesting reservoirs, irrigation systems, collection and marketing centres, and promotion of the honey value chain. The sum of these activities emits 781,566 t CO_2 eq over a 20-year period. Finally, activity 3.1.2 aims for the restoration and conservation of watersheds to sustain and regulate the hydrological cycle. This component generates the highest potential carbon sink as: -996,119 t CO_2 eq over 20 years. Overall, results show a positive environmental impact due to the implementation of the project activities, quantified at a total carbon balance of minus 377,497 t CO_2 eq over 20 years. Given the total area under focus, this would amount to a carbon balance of minus 0.6 t CO_2 eq per hectare per year (paragraphs 224 and 225 of the funding proposal). Paragraph 225 of funding

[14] AE response to question 36 in independent TAP document, Questions_FAO Bolivia_05Aug 2022.
[15] FAO Matrix with revisions made after independent TAP review 29 November (II. BASELINE ASSESSMENT OF GHG EMISSIONS).

proposal has been amended to clarify that the EX-ACT analysis included an exploration of the potential for methane emissions from water storage reservoirs, however the relatively small size of these structures and limited residence time of the water and organic matter yields negligible methane emissions. As noted in paragraph 118 of the funding proposal, capacity-building activities will include guidance on keeping the water storage facilities clear of organic matter.

27. **Risk of farmer exclusion**. In the first submission for B.34, the independent TAP raised the issue that there was a risk of exclusion for a group of farmer beneficiaries. There was uncertainty and the potential risk that the most vulnerable, poor and non-organized individual farmers may be excluded from some of the key transformative activities, for example, enhancing the resilience of farmers and crops (output 1.1) and agricultural livelihoods (output 1.2); climate proofing water and irrigation facilities (output 2); and enhancing farmers' access to finance (output 4.2).

28. Based on the beneficiary selection criteria,[16] the general criteria for the selection category of a farmer beneficiary were as follows: (i) residence within the project municipalities; (ii) high dependence on agriculture and/or natural resources; (iii) small-scale family farmers; (iv) those whose primary source of income depends on agriculture; (v) vulnerability due to exposure to environmental and climate change risk; (vi) household with five or more members; (vii) agrarian property titled by the National Institute of Agrarian Reform; and (viii) manifest willingness to implement project management practices. The criteria seem fair and reasonable.

29. When it came to specific project activities under the project outputs, the farmer beneficiaries were further distinguished. For output 1.1, the funding proposal stated that "for the distribution of climate-smart equipment the target farmer beneficiaries will be the same" and these were the "small[holder] farmers whose crops are affected by the extreme phenomena of hailstorms, frost and drought, which undoubtedly generate greater poverty, food insecurity and migration to urban centers in the country or abroad, in search of better living conditions." For output 2, "beneficiaries will be different then from component 1" in that these farmers will be "small[holder] farmers who have an organizational level and tradition in irrigated agricultural production, so the beneficiaries will be members of communities or irrigation associations that have been affected by drought and extreme phenomena of increased temperatures in their agricultural production systems."

30. As per the funding proposal therefore, the selected farmers for outputs 1.1 and 1.2 would be differentiated by their context of vulnerability, among others, but the same selected farmers under outputs 1.1 and 1.2 would also be benefiting from the activities under output 4.2.[17] From the description, there was also a distinction between farmers who are organized (for output 1.2) and non-organized (output 1.1).

31. However, based on the funding proposal (tables of indicators and criteria) and annex 2 selection criteria for beneficiaries of the funding proposal term sheet (annex 14, term sheet), in addition to the general criteria, there were other more specific criteria that included the following: (i) farmers who are members of producer associations with availability of counterpart in-kind and/or financial resources or farmers who can individually show means of maintenance of the equipment (for output 1.1, activity 1.1.1); (ii) producer associations with at least two years of active existence at the time the project is in force (output 1.1, activity 1.1.2); (iii) areas close to urban and/or peri-urban centres with high potential for the consolidation and/or development of local markets for family farmers (activity 1.2.2); (iv) associations of producers with possibilities of counterpart in-kind and/or financial resources (activity 1.2.3); and (v) family farmers with investment capacity as counterpart (activities 2.1.1, 2.1.3 and 3.1.2).

[16] B.34 Funding proposal, annex 4 labeled as FS_Methodology_Beneficiaries_Clean_20Jul2022.
[17] B.34 Funding proposal, annex 4 labeled as FS_Methodology_Beneficiaries_Clean_20Jul2022.

32. With these additional conditionalities, the independent TAP is of the view that the funding proposal submitted for B.34 generated a risk of excluding the most poor and vulnerable, non-organized or newly organized, remotely located farmers. The previous funding proposal created a provision where farmers who had the lowest absorptive, adaptive and transformative capacities were likely to be left out as potential (project) counterparts in outputs 1.1, 1.2 and 4.2, which include important resilience initiatives of the project. One advantage of preferring the organized and resourceful farmer was that they would be more eligible as a client or a bankable prospect for the proposed innovative financial products and services of the financial institutions under output 4.2. The effect of such a condition was that it essentially de-risked the financial institutions' lending activities instead of de-risking the vulnerable farmer's activities and financial transactions.

33. With the funding proposal resubmission for B.35, FAO addresses this issue. FAO has revised the criterion requiring investment capacity and financial resources in activities 2.1.1., 2.1.3 and 3.1.2, to emphasize that the contribution expected is in-kind (such as labour). The criterion that beneficiaries must be in areas close to urban or peri-urban centres has been removed to ensure no one is excluded due to their location. In output 4.2, the project will promote associativity to foster inclusion. This action will facilitate participation in producers' associations as part of efforts to enhance farmers' access to finance, (funding proposal paragraph 131). The producer associations will become a means to help the most vulnerable farmers to benefit from transformative activities, rather than a potential reason for exclusion. Activities 1.1.1, 1.1.2, 1.2.1, and 1.2.2 have been revised to emphasize in-kind contributions (such as labour) to ensure no one will be excluded and left behind. The above adjustments are now reflected in the modified criteria in activities 1.1.1, 1.1.2, 1.2.1, 1.2.2 and 2.1.1 of the funding proposal, feasibility study pages 148 and 152, and its appendix 4. [18]

34. **Risk of ineffective financial products, services and development of innovative finance products (output 4.2)**. In the first submission for B.34, the independent TAP raised this issue. One major impediment to the design of new innovative financial products was the impact of the existing law capping interest rates on loans offered to the farmers. There was little to no information on how this Financial Services Law[19] has impacted the agrifinance markets in general. Without a clear assessment as to how this had hindered lending to the agriculture sector, the success of a new financial product or service remained to be seen, thus potentially undermining the increased resilience through access to finance. A market study will help to assess the prevailing sources of formal and informal financing and the actual barriers among the farmers, private sector actors and financial institutions in the area of agribusiness finance. The AE needed to show evidence-based data to support this statement based on the success of this approach in other projects it has implemented previously. For example, the proposed development of a green financial mechanism for the production and irrigation loans also raises some concerns, especially on the irrigation side (e.g. purchase of modern drip irrigation technology). Without an assessment of a farmer's willingness and ability to pay for the proposed irrigation technologies, the proposed facilities, if and when launched, may have a limited number of takers. Private financial institutions lend on the basis of making investment returns

[18] FAO Matrix with revisions made after independent TAP review 29 November (I. CRITERIA FOR SELECTING TARGET FARMER BENEFICIARIES).

[19] The Government of the Plurinational State of Bolivia issued in August 2013 a new Financial Services Law (No. 393) aimed at regulating financial services to serve this economic segment. The law seeks to foster financial services especially for the farming segment, fishers, timber producers, artisans and micro, small and medium-sized enterprises (MSMEs), mainly in rural and peri-urban areas of the country. This law also enables the Government of the Plurinational State of Bolivia and the local Financial Supervisory Authority to determine credit allocation per economic segment and potentially establish caps on interest rates and fees charged by microfinance institutions. This may in turn be a challenge for the microfinance institutions if they are unable to cover their operational costs with mandatory loan portfolio allocations and caps to interest rates, hence limiting sustainability. (Source: funding proposal, annex 2, feasibility study.)

first and foremost. Given the interest rate cap by law and the high cost of funds for relending, financial institutions could still make available the financial product or service; however, the potential issue of its accessibility (e.g. higher credit standing needed) and affordability (e.g. maximum rate allowable but shorter payment schedules, or higher collateral requirements) could make the financial product or service unacceptable. Thus, the feasibility of a green credit facility cannot be assessed without conducting an in-depth agrifinance assessment. In the absence of an acceptable finance scheme, the sustainability of operating and/or maintaining a climate-proofed irrigation system was doubtful. The proposed indicator for the "Data of financial mechanisms with non-conventional guarantees" was the "Number of people to benefit from the improved financial mechanisms by accessing finance"; instead, this should be the number of farmers who have opened a basic savings account and availed themselves of a credit facility. Similarly, on the financial institution (supply side), the indicator for "Data on climate risks, financial mechanisms" should be the percentage increase of approved farmer loans due to the new financial product or service.

35. With the funding proposal resubmission for B.35, FAO addresses this issue and has completed a market study on Bolivia's rural agrifinance market.

(a) The market analysis covers the following areas: an overview of the financial system in Bolivia; a review of current financial/banking regulations related to the agricultural sector; a categorization of types of financial institutions with a focus on the performance of the productive financial sector and impact of the financial services law; an overview of the barriers and advantages associated with different forms of productive credit from the perspective of the borrower and the lender; and a brief discussion of the state of agricultural financial insurance.

(b) The agrifinance market study (feasibility study, pages 16-18) confirms the previously stated finding that the interest rate cap discourages both traditional commercial banks and local financial institutions and entities specialized in microcredit from investing in the productive agricultural sector.

(c) It also shows that there are "9 categories of productive credit vehicles; and given fixed interest rates many of these may be more profitable for lenders and financial intermediaries than for rural farmers. The agro-financial market, in addition to the normal commercial risks of small borrowers, is affected by the perverse effects of climate change, which impacts productive loan repayments, reduces the performance of the lender's portfolio, and raises the risk of sanctions or fines from the ASFI (financial system supervisory authority). Similarly, climatic effects have adverse effects on customers in the productive sector (especially agriculture), since their expected yields may be affected."

(d) On the demand side, the agrifinance market study indicates that, in rural areas, the main destinations of microcredit are for: agriculture and livestock (42 per cent), followed by financial intermediation (since 2018) and others in third place with an average of 15 per cent per year (feasibility study page 19).[20]

(e) The proposed GCF project reduces farmers' vulnerability to climate related impacts. Over the medium-to-long term (the project implementation period), the project will reduce the risk of borrowing from the perspective of the farmer by providing increased certainty about yields and cash flows as a result of climate-resilient production systems. At the same time, the project will reduce the systemic climate-related risk that makes agricultural lending less attractive to lenders than other sectors. Table 8 of the funding proposal and the description of output 4.2 in section B.3 present the mutually reinforcing nature of the climate resilience investments in facilitating access to credit,

[20] Annex 2 - feasibility study, page 19

and the need for credit to ensure the sustainability of climate resilience measures in the long run. Support to a green credit facility is intended to reduce transaction costs for lenders and for borrowers engaged in climate resilient agroecological practices.

36. As to the issue of indicators, FAO states that the "iTAP recommendation about appropriate indicators is noted. FAO believes that 'number of people' or 'number of people in farming households' [more] appropriately captures the household nature of farming in rural Bolivia than 'number of farmers'." FAO also notes that basic savings accounts and credit facilities are not the only or necessarily the most appropriate financial mechanism in every single case. Therefore, FAO has updated the relevant indicator to read, "Number of people in farming households with access to financial mechanisms". On the supply side, the funding proposal has also been updated to refer to "number of approved farmer loans due to the new financial product or service".

37. **Limited private sector participation (output 4.2)**. In the first submission for B.34, the independent TAP raised this issue.The funding proposal capacity-building activities ought to target more of the private sector financial institutions. Activity 4.2.1 did not have a dedicated private sector financial institution in its capacity-building activities; the Association of Development Finance Institutions (FINRURAL), which is an association of development financial institutions, is not a bank, although it may be representing financial institutions and be able to invite some private financial institutions that are engaged in the agrifinance markets. The lack of private sector actors impedes the development of an active agrifinance sector, thus limiting the potential mainstreaming of climate 1in agrifinance and, in particular, accessing climate finance and investments from the private sector.

38. With the funding proposal resubmission for B.35, FAO addresses this issue. FAO also demonstrated that in the market analysis, Bolivia's financial sector contains multiple categories of financial intermediation, as described in the feasibility study , pages 17 and 18. The project will engage different types of public and private financial institutions to support the farmers in the Valles Macro-region. Therefore, paragraph 131 in the funding proposal has been amended to emphasize that the "capacity-building activities under activity 4.2.1 are intended to engage a wide variety of financial intermediaries in order to strengthen the mainstreaming of climate in the agrifinance system, and specifically in the Mancomunidad." [21]

39. **Limited government institutional stakeholders**. In the first submission for B.34, the independent TAP raised this issue. The focus on building the institutional and technical capacities of the government institutions, namely the Banco de Desarrollo Productivo (Productive Development Bank – BDP), the National Forestry Development Fund (FONABOSQUE), and the National Institute of Agricultural Insurance (INSA), was positive but a more balanced, equitable representation approach with the participation of other government institutions should have been taken. Government institutions that are the least knowledgeable with regard to climate change, or had not yet mainstreamed climate in their operations, should have been made part of the project. The concentration of climate knowledge and capacity on a limited number of institutions could hinder a whole-of-government approach in mainstreaming climate. Among these institutions, BDP, for example, was an aspiring national implementing entity, and most likely had already mapped out its current range of products that were being provided to the farmers; thus, there was little need to repeat the exercise under the funding proposal activities.

40. With the funding proposal resubmission for B.35, FAO addresses this issue. FAO has also revised paragraph 134 in section B.2 (Project Description) to involve a broader range of government institutions in the institutional and technical capacity-building activities, while keeping the focus firmly on those institutions that can support the adoption of climate resilience

[21] FAO Matrix with revisions made after independent TAP review 29 November (V AGRIFINANCE MARKET STUDY).

interventions in rural Bolivia. Paragraph 134 of the funding proposal has been updated to note that "BDP is considering accreditation as a GCF direct access entity for Bolivia and could potentially be a partner in supporting these capacity strengthening efforts within other government institutions."[22]

41. **Risk of ineffective selected adaptation and resilience measures for farmers and agroecosystems**. In the first submission for B.34, the independent TAP raised this issue. The proposed adaptation or resilience measures may be ineffective owing to a perceived lack of more in-depth assessment of a farmer's socioecological situation.

42. For example, a social management failure was observed regarding maintenance of irrigation systems. Despite having legal or regulatory provisions and management frameworks tied in with the local governance systems, past efforts and investments in the management of irrigation systems, including equipment, could not be favourable towards the maintenance of equipment.

43. Despite the fact that current practices had largely failed to manage their lifeline in irrigated production systems (i.e. the irrigation equipment), the project intended to give farmers the latest technologies, without assessing their ability to understand their own management capacities, willingness to pay for the O&M and ability to raise finance on their own to cover O&M. Since the earlier project-oriented efforts of irrigated agriculture had not moved the farmers towards sustainability, upgrading irrigation technology was likely to complicate a local-level management system. The time and efforts considered by the project for building farmers' capacities were deemed inadequate, given the history and extremely weak management practices.

44. With the funding proposal resubmission for B.35, FAO has addressed this issue and has conducted a detailed baseline assessment of farmers' socio-ecological situation (feasibility study, appendix 5) to address this issue.[23]

(a) FAO reports that the proposed project is designed to build on lessons learned from past irrigation efforts, by focusing on interventions that are financially viable for farmers and by establishing an O&M programme that reflects best practices developed over the past several decades (see funding proposal paragraphs 113–117). As to lessons learnt related to O&M, a PROAGRO sustainability and self-management of irrigation study from 2020 showed that after three years, only 20 per cent of the irrigation systems presented problems for continuity and sustainability. Results of studies on irrigation projects in the 1990s (Center for Intercultural and Indigenous Studies, 1991) reported that the provision of technical assistance in the development and management of irrigation in the country was, in general, limited, partial or simply non-existent, because the projects had an exclusively technical approach focused on delivery of equipment, without taking into account the social nature and/or cultural vision of irrigation; thus the flawed approach contributed to the deterioration in some irrigation systems. Those studies also observed that the successful technological irrigation projects are those with support managed by non-governmental organizations and/or foundations, which monitor the operation and maintenance in the medium term (5 years).

(b) These lessons contributed directly to the design of the current project proposal, which includes measures that ensure the sustainability of the irrigation systems, such as developing capacities and follow-up for at least 2 years to ensure continuity (funding proposal, paragraph 117), providing support and capacity development of smallholders for the correct operation and timely maintenance of irrigation systems and

[22] FAO Matrix with revisions made after independent TAP review 29 November (V AGRIFINANCE MARKET STUDY).
[23] FAO Matrix with revisions made after independent TAP review 29 November (III IN-DEPTH BASELINE ASSESSMENT OF FARMERS IN THE VALLES MACRO-REGION).

accompanying beneficiaries during and after the implementation of the project so they can take ownership of operation and maintenance (funding proposal, paragraph 117). Information on the success rate of previous initiatives and the importance of building capacity on O&M has been added to the funding proposal (in paragraph 49, 65 and 114-118). The O&M plan (annex 21) provides further details on how these lessons have been incorporated into the design of the project design. Moreover, FAO states that the annual cost of O&M is USD 650, or USD 54,16 per month when the cost is to be divided among the families who are beneficiaries of the system. Considering the average system (72 families), the monthly cost per family is USD 0,75. Given the average farmers´ monthly income in the Valleys Macroregion is USD 330, the percentage of the farmers´ income to the O&M funds is 0.23 per cent% monthly, which is deemed affordable.[24]

(c) The proposed drip and sprinkler technology system is considered to be easier to handle compared to other technologies such as industrial machinery, digital equipment, etc. There are already experiences in the country of technological irrigation and numerous areas have adopted this in different Mancomunidades with irrigation committees in place, meaning that there is a base in terms of knowledge of technological irrigation systems (see funding proposal, paragraph 65; feasibility study, pages 48 and 49).

45. **Slash and burn**. In the previous submission for B.34, there was also the unresolved issue regarding the farmers' former use of slash-and-burn techniques, which caused not only deforestation but also severe land degradation by influencing gradual topsoil erosion in the hilly and mountainous terrains; the dry and wet cycles in local hydrology eventually brought in washed out sediments. These factors damaged the farm and irrigation equipment, lessened its rated economic lifetime, and thus increased its O&M costs, which meant an additional burden for poor farmers. The simultaneous operation of tradition-based slash and burn and a modern irrigation system appeared counter-productive to the overall improvement of farming practices, with slash and burn actually causing more harm through deforestation.

46. With the funding proposal resubmission for B.35, FAO affirms that "the project fully anticipates and takes into account the need to support farmers in the conversion from conventional practices to more sustainable farming techniques. Paragraph 100 in the funding proposal directly addresses the topic of slash-and-burn techniques and proposes, under activities 1.1.1 and 1.2.1, awareness-raising workshops and trainings in fire-free production practices (described on page 165 of the feasibility study). In addition, climate-resilient agriculture practices will reduce the burning and illegal logging of forests, as these will have to move towards more technological practices (see funding proposal, paragraph 103)",[25]

47. **Missing focus on farmers' health and productivity**. In the first submission for B.34, the independent TAP raised this issue. As agriculture is an outdoor activity farmers are very much exposed to the impacts of climate change and its possible effects on their health and productivity. Heatwaves or prolonged exposure under the sun or the impacts of frequent extreme weather events could reduce farmers' effectiveness as well as their long-term interest in farming activities, factors which will inevitably translate into lower crop yields and low income. The funding proposal had not covered an analysis of the impact of climate change on farmers' health and productivity, how increasing temperatures or intensified rain affect their capacity to carry out agricultural crop farming or how the frequency and duration of extreme weather events (drought, floods) and their impacts have forced some farmers to migrate out of the Valles Macro-region and look for alternative livelihoods. Stakeholder consultations barely mentioned health and productivity, focusing instead on the activities and crops without considering the farmer carrying out these activities.

[24] Independent TAP questions for FAO Bolivia 16/01/2023.
[25] FAO Matrix with revisions made after independent TAP review, 29 November (Section III IN-DEPTH BASELINE ASSESSMENT OF FARMERS IN THE VALLES MACRO-REGION).

48. With the funding proposal resubmission for B.35, FAO addresses this issue. FAO has conducted an in-depth baseline assessment of farmers in the Valles Macro-region. FAO highlighted here that the proposed project interventions are intended to provide relevant co-benefits also on farmers' health and productivity. FAO further states that "The same climate impacts that can affect farmers' health and productivity are also responsible for the impacts on crop production that the project is designed to address. Among other things, increased productivity is intended to reduce the amount of effort and exertion required to generate each kilogram of product, or increase the payoff from a fixed amount of effort and physical exertion. These measures are also intended to improve the quality of life for farmers by diversifying diets, improving year-round food availability, and creating financial safety nets via increased incomes." Section D.3 of the funding proposal has been expanded to elaborate on how the project contributes to the health and well-being of beneficiaries.[26]

49. **Weak baseline assessment on agroecosystem resources**. In the first submission for B.34, the independent TAP raised this issue. The funding proposal had not adequately described how the interplay of climatic and non-climatic factors impacts the agroecosystem (i.e. forests and water). Essentially, this should describe which impacts are attributable to climate change (e.g. increasing temperatures and drought) and business-as-usual development, and which to anthropogenic activities (e.g. clearing of forests for agricultural or industrial plantations, increased wood harvesting, slash-and-burn activities) per municipality. The funding proposal needed to show further granularity on the linkages of climate change impacts on the agroecosystem, especially on the degradation of forest and water; essentially, it seeks to ask if these pressures are due to climate change more than the pressure to clear forests for food production, primary production materials and energy production.

50. With the funding proposal resubmission for B.35, FAO addresses this issue. FAO has adequately conducted "additional analyses to demonstrate the attribution of climate change to the observed impacts. This has been done with the support of data available and provided by national universities engaged in hydro-climate monitoring initiatives. The WEAP (Water Evaluation and Planning) model was used to understand the impacts of climate change, climate variability, and anthropogenic activities on the hydrological cycle. The model considers the main factors influencing the hydrological cycle. Changes in the water supply have been modelled considering changes in land use and land cover (2010—2020) for the climate of 1980–2015 (this includes deforestation and burning coverages, among others). Changes in water demand have been studied considering evapotranspiration, population growth, and other factors. The greatest disaggregation possible was used with the available data: 61 hydrographic units within the Macro-region. The conclusion from these analyses is that the changes in discharge as modelled in the climate change scenarios can be mostly attributed to climate change and not to land use changes. Information has been added to the funding proposal (paragraph 56) reflecting the summary of this analysis. Feasibility study (pages 83–89) presents detailed results and methodology. Feasibility study appendix 3, section 3 details the methodology specifying the model used to calculate evapotranspiration. The increase in average temperatures in combination with a decrease in rainfall relates closely with more intense and prolonged droughts in the Chiquitano Dry Forest over the last 39 years and supports the hypothesis that climate change can affect the increase in the occurrence of forest fires. However, there is not sufficient data to estimate the future loss of forest area due to forest fires caused by climate change. Reference evapotranspiration is directly related to increase in temperature and changes in precipitation. In the Amazon basin, the actual evapotranspiration will likely decrease because of the lower rainfall and therefore less availability of soil moisture. In the Plata basin, it

[26] FAO Matrix with revisions made after independent TAP review, 29 November (Section III IN-DEPTH BASELINE ASSESSMENT OF FARMERS IN THE VALLES MACRO-REGION).

is expected to have an increase of ET, influenced by increases of temperature and precipitation. Details could be found in feasibility study appendix 3, section 6.3, Evapotranspiration". [27]

51. Adaptation impact potential based on the submitted documents is assessed as high.

1.1.3. Mitigation co-benefit

52. The funding proposal has treated the climate mitigation component of the project as a co-benefit; as per the AE and funding proposal, the main objective of the RECEM-Valles project is adaptation. While there is no indicator for mitigation, the expected co-benefit of emission reductions comes from the avoided loss of forest cover and wetlands cover, sequestration from agroforestry and reduced or avoided emissions from crop losses.[28] The estimated total emissions from forest management activities amount to 1.5 million t CO_2.

53. Based on the first submission to B.34, the independent TAP raised the issue of assessing the BAU and potential GHG footprint arising from the agriculture and economic activities along the business value chains as a result of the proposed interventions.

54. With the funding proposal resubmission for B.35, FAO has addressed such issues and included as part of annex 6 an assessment of GHG emissions for the whole project. Results derived from using the EX-ACT Tool show that the project in its totality leads to a total carbon balance of minus 377,497 tCO_2 eq over a period of 20 years. The increase in GHG emissions from inputs and investments along the business value chain is more than offset by the initiatives in forest and cropland management. (See Table 1 results of EX-ACT GHG balance.)

Table 1. Results of EX-ACT GHG balance

Component	Emissions
Cropland	-162,943
Forest Management	-996,119
Inputs & Investments	768,929
Inland Wetlands	411.92
Refrigerant leakage	10,335
Honey value chain	1,1890
Total carbon balance	**-377,497**

Source: Funding proposal

55. The assessment of the GHG emissions provides clarity that the proposed project will not lead to unintended consequences (e.g. carbon emissions lock up) and, most of all, will enable the country to align itself with the Paris Agreement objectives through this project.

1.1.4. Risk to mitigation impact: not applicable

56. Mitigation co-benefit potential based on the submitted documents is assessed as high.

1.2 Paradigm shift potential *Scale: High*

57. There is a clear paradigm shift due to the wholistic and integrated approach in the transformation of the farmers, agroecosystems, agribusiness value chain livelihoods, investments and institutions towards climate resilience and low-carbon development pathways; this approach is an improvement compared to the piecemeal or tokenize approaches previously

[27] FAO Matrix with revisions made after independent TAP review 29 November (IV. IMPACTS ATTRIBUTABLE TO DEVELOPMENT AND CLIMATE CHANGE, VARIABILITY AND EXTREME EVENTS.).
[28] AE responses to independent TAP question 37 in independent TAP document: Questions_AO Bolivia_05Aug2022.

adopted in the project area. As presented in annex 3, the overall impact of the integrated and wholistic intervention in the agroecosystem shows a positive net present value as compared to the previous approaches, which yield a negative net present value (see annex 3, and section 1.7 on economic and financial analysis). The funding proposal is a potential replication of MiRiego's successful initiatives[29] in the Plurinational State of Bolivia but tailored to the RECEM-Valles project. If the funding proposal is implemented correctly, the paradigm shift is potentially high. A clear understanding of the baselines is key to appreciating the potential paradigm shift.

58. In the first submission for B.34, the project had presented the baseline conditions of the vulnerable farmers, livelihoods, water and irrigation facilities, and the critical ecosystem resources (e.g. watershed), conditions and governance needs. However, certain baselines were not clear or adequate. Given the holistic and integrated approach of the project, a weak link in the various components may put at risk the paradigm shift; hence the uncertainty, as the RECEM-Valles project was only as strong as its weakest link. The weak links are described below.

1.2.1. Risk to paradigm shift

59. **Weak baseline for agrifinance**. In the first submission to B.34, the independent TAP raised the issue of baseline assessment for agrifinance and advised that it needed to be further improved. In the absence of a clear and in-depth assessment of the barriers from the perspective of the smallholder farmers (demand side) and the financial institutions, such as lending and insurance institutions, both formal and informal, national and local (supply side), it was hard to say what the nature and degree of the paradigm shift would be. No adaptation project could be sustained if there was no sustainable agrifinance to support it beyond the project implementation period.

60. The independent TAP has raised this issue in its question to the AE. Specifically, it requested clarification on activity 4.2.2 (Strengthen the capacities of communities, smallholders and associations on financial management and access to innovative financial instruments relevant for climate-resilient agriculture), specifically: (i) "what existing innovative financial instruments for CRA are currently available in the market which the smallholder farmers or producers association can get?"; and (ii) has the AE "conducted a baseline assessment of what the agrifinance market is/determining who the major lenders are, what their typical rates, conditions are, portfolio loan defaults, etc.?"

61. The AE replies were as follows. For item (i), "As described in the funding proposal. paragraph 113, the following institutions have already been offering financial mechanism support to small-scale farmers in the project area, based on the legal framework in Bolivia: Productive Development Bank (BDP), Association of Development Finance Institutions (FINRURAL), FONABOSQUE and the National Institute of Agricultural Insurance (INSA), but none of them were innovative or adequate and effective for small farmers, as their current financial instruments are traditional ones." For item (ii), the response was "Information is included under the funding proposal, paragraph 71 on the limited access of smallholder farmers to financing to build resilience and on lessons from previous initiatives on establishing financing mechanisms for smallholder farmers in Bolivia. Also, in the feasibility study , please see page 62, with information including census information on the access to credits. More information on the products offered by BDP can be found from page 228 and on the agricultural insurance from page 231."

62. The independent TAP then sought for an in-depth evidenced-based market assessment on which to form rational decisions essentially, an in-depth analysis of the agrifinance market to understand what were the barriers to finance (i.e. finance availability, accessibility,

[29] See paragraph 65 of the funding proposal.

affordability, acceptability). The aim is to understand whether agrifinance, formal or informal, exists from private, public or even official development assistance types. The independent TAP wished to determine whether the existing finance schemes were accessible to smallholders; if accessible, were they affordable; and if affordable were they culturally acceptable to the indigenous peoples. From the perspective of the financial institutions and microfinance institutions (MFIs), the independent TAP would also like to understand if there was already an active agrifinance market; how the loans performed; how these loans had been affected by climate change impacts; and how the financial institutions and MFIs priced the loans and structured conditions and security. Similarly, for the insurance providers, the independent TAP sought to know more about the market/penetration rates of insurance, how climate-related risks (acts of God) had impacted the insurers or, if there was a parametric index insurance, what the features were (e.g. eligible crops, payouts, climate parameters to trigger a payout). The independent TAP would like to understand the dynamics of how these existing financial instruments mutually address the needs of both farmers and financial institutions. Given that there was an existing law that caps lending interest rates of financial institutions, it was helpful to know in greater depth why the agrifinance market had not developed. The intention was to gain as much knowledge and understanding as possible of the agrifinance stakeholders' best practices, whether a new financial instrument or a creative financing structure using existing instruments. The proposed financial interventions in the funding proposal could not be assessed with regard to whether or not these would address the key sustainable finance barriers for all stakeholders, without a deeper understanding of the agrifinance markets relevant to the target project areas.

63. With the funding proposal resubmission for B.35, FAO addresses this issue. FAO has completed a market study on Bolivia's rural agrifinance market (see the explanation in paragraph 37 above and the footnote on FAO Matrix with revisions made after iTAP review 29 Nov (V AGRIFINANCE MARKET STUDY)

64. **Baseline for crops, forest and water**. In the first submission for B.34, the independent TAP raised these issues and the potential paradigm shift was affected by the interrelated question of forest and water resources. With respect to the unabated degradation of forests and depletion of water which was endangering sustainability of the watershed resources, the funding proposal had not clearly elaborated to what extent the damage to the forest and watershed areas and the water deficit could be reasonably attributed to human development (agricultural land expansion) and what extent to climate change (e.g. via increased temperatures causing forest fires or evapotranspiration). As regards crops and climate change, the evidence base for crop evapotranspiration loss was weak, even after seeking greater clarification through the question and answer process; it may be premature to present greater moisture loss as an inference which was scientifically convincing. For a clarification on the forest fires, for example, the independent TAP asked, "In paragraph 51 of the funding proposal the issue of forest fire is highlighted. In the corresponding section related to forest fire in the feasibility study , there is no mention of a frequency analysis (during baseline climatology and the timeframe where climate change-related impacts are becoming visible). Could you please provide a frequency analysis for the occurrence of forest fire compared against a long-term trend analysis?" The AE replied as follows: "Available data (January-–October) reveals that fires in 2019 were 79 per cent higher than in 2018, 49 per cent higher than the average of the last 10 years (2009–2018, January–October), and 52 per cent higher than the average during the last 3 years (2016–2018, January–October). (WWF, 2020. Forest Fire Report Bolivia. Programa de Incendios Forestales). In 2019, some climatic factors were identified, such as the high water deficit (62 per cent) and higher average temperatures compared to previous years (an increase of 0.7 °C compared to 2018 was recorded in the city of Santa Cruz de la Sierra, the closest department to the affected areas). The increase in average temperatures was part of a trend that went hand in hand with more intense and prolonged droughts in the Chiquitano Dry Forest in the last 39 years."

65. For a clarification on the water deficit due to climate impacts, the independent TAP posed the following question: "Table-9 of the feasibility study provides for projections of agricultural production to 2025. Apparently, the projected water balance is estimated on the basis of such a projection of production. However, the change in deficit due to climate change-induced drought (in terms of evapotranspiration) with respect to current production must be worked out against the overall deficit; the latter may be emanating from a number of considerations. Reference is made to sub-section on water balance in the feasibility study (page 76). Should the total projected deficit in available water be attributable to climate change? If not, what is your sensitivity analysis regarding per cent of change attributable to climate change-induced evaporative losses from crop agriculture as against total water deficit considering all other parallelly occurring non-climatic factors?" The AE response was as follows: "The total projected deficit cannot be attributed only to climate change. The analysis of the water balance in section 7 (hydrological balance) of the feasibility study considers the effects of increased production as well as climate change on the water balance, under current conditions and in future climate change scenarios (RCP 4.5 and 8.5). This analysis shows an increasing water deficit under the climate change scenario. Table 9 of the feasibility study shows projected increases in production of between 56 per cent and 588 per cent. However, the growth scenarios in FAO publication (2018) The future of food and agriculture: Alternative pathways to 2050, anticipate significantly smaller increases in crop area and irrigation requirements (between 4.8 per cent and 17.6 per cent) as a result of improved production methods."[30]

66. With the funding proposal resubmission for B.35, FAO addresses this issue. The independent TAP opines that:

(a) The use by FAO of the WEAP (Water Evaluation and Planning system), which is a user-friendly software tool developed by the Stockholm Environment Institute that takes an integrated approach to water resources planning, is a reasonable tool for this particular case. However, the hydrological modelling carried out by Fundación Amigos de la Naturaleza (FAN) in 2021 using WAEP compares the hydrological demand and supply for the Valles Macro-region under climate scenarios for the demand for the period 2036–2065, with the climate change scenarios: MIROC5 RCP_4.5 and MIROC5 RCP_8.5 in the Amazon region; CCCma-CanESM2 RCP_8.5 and ICHEC-EC-EARTH RCP_4.5 in the Plata region.

(b) This may be a concern as the use of the RCP 8.5 is a doomsday scenario. Considering that the RCP allows exaggeration of scenario-driven results due to the fact that RCP 8.5 is practically the doomsday scenario and well beyond the realm of ambitious nationally determined contribution commitments under the UNFCCC, one should not consider RCP 8.5 results; and as independent TAP, we caution FAO to refrain in citing such results produced under the exaggerated scenario. Nevertheless, when evaluating the water supply-demand on a monthly basis (figure 34 of annex 2), the difference between RCP_8.5 and RCP_4.5 is barely visible, and the water deficit in the months of August, September and October is quite evident. Based on bona-fide evidence that the WEAP tool was adequately used and the need for better water management systems (as stated in this funding proposal) is evident[; (ii) 2]. As to the question whether the water stress observed in figure 1 below is due to inadequate management of local resources (e.g. see decrease in forest area of Bolivia in the following figure, 'Forest Area in Bolivia') or due to climate change, is not clear Based on the FAO analysis (see annex 2, pages 85–87), the influence of anthropogenic actions is minimal. "To understand the influence of anthropogenic actions versus climate change over the hydrological cycle, the effect of changes in land use and land cover resulting from anthropogenic activities was modelled. This was done by simulating the average hydrologic cycle for the climate of

[30] See the AE's full response to independent TAP question 19 in Independent TAP Questions_FAO Bolivia_05Aug2022.

Source: FAO

1980–2015 combined with the land cover situation of 2010 and comparing this with the hydrologic cycle for the landcover situation of 2020. Results show that while there are significant changes in land cover over the period 2010–2020 (for example an increase in agricultural area of 3.72 per cent in the Plata basin), the changes in modelled discharge are below 0.01 per cent (in the Plata basin – an increase in discharge of 0.004 per cent is modelled). The analysis concludes that compared to the expected changes due to the influence of climate change, changes in water supply due to changes in agriculture coverage over 10 years, considering the 2010 and 2020 maps, play a very insignificant role. The analysis confirms that climate change is responsible for droughts." Moreover, given that the essence of the drought analysis indicates there will be a hydrological imbalance towards seasonal water stress, this is sufficient evidence that climate change is indeed affecting crop production and loss of livelihoods as well. The uncertainty of this aspect in the previous submission has now been satisfactorily covered.

Figure 1. Forest Area in Bolivia: 1990-2016

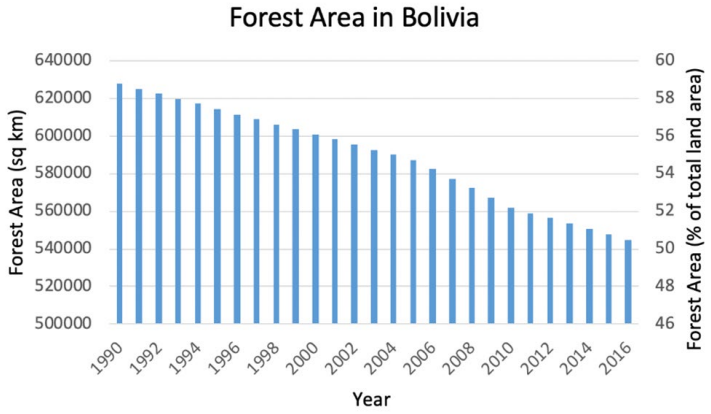

Figure 2 Forest area in Bolivia: 1990 – 2016 (Source: FAO)

67. **Risk of maladaptation**. In the first submission for B.34, the independent TAP raised this issue. If not fully grounded on farmers' socioecological issues, due to the weak farmer baseline assessments, the proposed adaptation and resilience in the funding proposal may lead to unintended consequences or maladaptation. The rehabilitation or upgrade of water and irrigation facilities and equipment close to a forest patch may lead to increased unsustainable farming activities. Farmers may begin cutting and clearing forests to expand farming land as a result of the availability of water resources and modern irrigation equipment; deforestation is entirely against the GCF mandate. New access from informal sources to finance slash-and-burn activities was quite likely given that informal private money lenders, who stand to lose farmer clients as they shift to the more formal finance sources, were likely to entice farmers to borrow. Thus there was no guarantee of whether the millennia-old practices around slash and burn could be stopped, particularly if there was very little control on monitoring the day to day activities of farmers. The question then was who would guarantee that farmers would stop practising slash and burn.

68. With the funding proposal resubmission for B.35, FAO addresses this issue. FAO has added a new category of risk related to maladaptation (section F on risks and mitigation). The FAO further confirms that the project does not (i) promote short-term adaptations that decrease adaptive capacity and hinder future choices; (ii) shift vulnerability from one group to another, or one area to another; (iii) erode sustainable development though adaptation strategies which increase emissions, deteriorate environmental conditions and/or social and economic values. It also states that maladaptation can be avoided by flexible, multisectoral, inclusive and long-term planning and implementation processes. As noted in the funding proposal, feasibility study and environmental and social management framework, the project's

design reflects "(i) the benefits of stakeholder engagement, where beneficiaries expressed their needs; (ii) the long-term vision of the project; (iii) a governance mechanism that will be in place for the project; (iv) appropriateness of adaptation options such as resilient agriculture, including agroecology; (v) inclusion of the most vulnerable and marginalized groups; and (vi) expected net emission reductions are presented in the funding proposal as a co-benefit." [31]

69. **Risk of exclusion of most vulnerable farmers**. In the first submission for B.34, the independent TAP raised this issue. From the perspective of farmers' participation, especially the poorest and most vulnerable farmers, this risk remained to be seen. As explained in paragraph 27 above, there was no paradigm shift for farmers if they were excluded from participating in outputs 1.1, 1.2 and 4.2, among others. The selection criteria was a moving target and needed to be addressed squarely during the stakeholder consultations and last-mile agreements.

70. With the funding proposal resubmission for B.35, FAO addresses this issue, and has revised the selection criteria (see paragraph 33). FAO has emphasized that: "The RECEM-Valles project has been designed to address the needs of the most climate-vulnerable farmers in Bolivia's Valles Macro-region. The primary criterion for inclusion in project activities is vulnerability to climate change, which is assessed along multiple axes including conditions of extreme poverty (funding proposal paragraphs 93, 95–97). In addition, the beneficiary selection criteria is based on lessons learned from past projects. As explained in paragraph 33, FAO emphasizes that, according to the baseline analysis for this project, the requirement to make a contribution is unlikely to be a barrier to participation in the project area. Activities 1.1.1, 1.1.2, 1.2.1 and 1.2.2 have been revised to emphasize in-kind contributions (such as labour) to ensure no one will be excluded and left behind.[32]"

71. Overall, based on the above, the paradigm shift is high.

1.3 Sustainable development potential *Scale: High*

72. **Economic co-benefits**. If implemented correctly, the RECEM-Valles integrative approach will improve and transform the traditional agriculture based economy into a climate-smart agriculture business value chain. The combined adaptation interventions in the agroecosystems will surely increase economic activities as presented in the economic and financial analysis (see annex 3 to the funding proposal). If done correctly, the economic benefits will directly arise from the de-risking of the agricultural activities for farmers, especially in the last-mile segments, focusing on improved access to major markets, access to finance and to skills and knowledge on business development. From the supply side, the economic benefits will arise from the de-risking of the financial transactions through the issuance of new innovative green credit and parametric insurances that may lead to an increase in lending and insurance businesses. The success of such de-risking activities and replication in the sector in other regions bodes well for increased agricultural activities, especially during a period of economic recovery from the 2019 coronavirus disease pandemic and the impacts of global economic shocks arising from the Ukraine-Russia conflict.

73. **Gender mainstreaming**. The funding proposal has a gender assessment and gender action plan, and gender has been fully mainstreamed in each of the activities for each of the four funding proposal components. Recognizing the major role of women in target areas where they manage 48 per cent of the households and agriculture-related activities,[33] women are given equal access, and in fact priority, in each of the project activities. Women are given access to

[31] FAO Matrix with revisions made after independent TAP review 29 November (II. BASELINE ASSESSMENT OF GHG EMISSIONS).
[32] FAO Matrix with revisions made after independent TAP review 29 November (I. CRITERIA FOR SELECTING TARGET FARMER BENEFICIARIES).
[33] Para 10 of the funding proposal

resources (climate-smart technology and equipment, training on climate-smart agriculture, access to finance, advisory services) and, notably, women's important role in governance initiatives is mainstreamed (e.g. basin master plans, O&M plan, Territorial Plan of Integral Development (PTDI)).

74. **Environmental co-benefits**. If implemented correctly, the carbon sequestration through soil, reforestation and afforestation, increased vegetation and avoidance of forest degradation and deforestation, is a major environmental co-benefit; this is highly valuable considering that the targeted areas are part of the endangered Amazon Rainforest. Forest management activities are expected to establish restoration programmes, thereby reducing and eliminating deforestation in the project's intervention area. Starting with a forested area of 1.22 million ha, the business-as-usual scenario anticipates an annual deforestation rate of 0.34 per cent, resulting in a loss of 20,590 ha for the 5-year period. Project activities are intended to halt this deforestation and support restoration, resulting in incremental GHG emission savings of 2.5 million tonnes of carbon dioxide equivalent over five years. If the forest degradation due to development and climate change is addressed, water resources will be protected.

75. **Sustainable Development Goals (SDGs)**. The project can be linked to several SDGs, including SDG 1 "No poverty" (targets 1.1, 1.4 and 1.5); SDG 2 "Zero hunger" (targets 2.1, 2.3, 2.4 and 2.5); SDG 5 "Gender equality" (targets 5.5 and 5.A); SDG 6 "Clean water and sanitation" (targets 6.4 and 6.6); SDG 8 "Decent work and economic growth" (targets 8.2, 8.3, 8.6 and 8.9); SDG 13 "Climate action" (target 13.2); and SDG 15 "Life on land" (targets 15.1, 15.2, 15.3, 15.4 and 15.9).

1.3.1. Risk to sustainable development

76. The project covers 65 municipalities in the Plurinational State of Bolivia. The proposed activities ought to lead to behavioural changes of people, and involve a multitude of farmers, farmer associations, indigenous peoples and women. In the first funding proposal submission for B.34, the weak coordination, collaboration and, in particular, communication of the project goals to the funding proposal beneficiaries would have undermined the implementation of the proposed project's activities and subactivities, and risked failing to achieve the relevant SDGs; the weak monitoring of the numerous smallholder farmer activities may lead to environmental degradation or maladaptation.

77. This risk is reduced in the present funding proposal submission for B.35.

78. Overall, based on the above, the sustainable development potential of the project is assessed as high.

1.4 Needs of the recipient *Scale: High*

79. There is a need to leapfrog towards climate-resilient agriculture. Smallholder farmers typically are engaged in subsistence farming on a piece of land (approximately 0.5 to 2.0 ha), on which a family of five or more help out in planting traditional crops. Typical crops include potatoes, maize and vegetables, and other complementary crops, depending on the altitude, such as beans, chili peppers, peanuts and fruit trees, especially stone fruits. These farming areas mainly rely on rainfall for irrigation using existing ponds and canals. The crops are increasingly exposed to the adverse effects of changing climate, variability and extreme events. The funding proposal then and now directly addresses these needs. Component 1 seeks to increase farmer resilience via access to and use of climate-friendly equipment and training on climate-smart agriculture from production to market. Component 2 seeks to increase the resilience of farmers' water and irrigation facilities for production. Component 3 seeks to increase the resilience of the watershed resources that support farming activities via restoration of the micro-ecosystem.

Component 4 enhances farmer resilience via enabling access to finance and improving governance for ecosystems. The holistic approach of the project, covering the whole business value chain from production to post-production and access to markets, along with the integration of tools and services enabling the transition (certification, innovative finance, collection centres, cold chain logistics, governance on water, irrigation), leads to the transition towards resilience of the agroecosystems. The needs of the farmer recipients of the seven departments (Sopachuy, Sucre, Potosi', Camargo, Tarija, Samaipata, Cochabamba) have been clearly discussed with the target farmer beneficiaries based on the stakeholder consultations conducted.[34] These priority needs have been reflected under components 1, 2, 3 and 4. Component 2 complements Component 1; Component 3 seeks to ensure the sustainable management of the water basins to better enable the irrigation demands as implemented in Component 2. Component 4 aims at institutional strengthening and enhanced access to climate finance to sustain and strengthen Components 1, 2 and 3.

80. **Need for financial inclusive products and services**. Component 4 needs to be highlighted, mainly because of the urgent need to address access to finance of the smallholder farmers, especially women. Without financing, these initiatives are likely to be unsustainable. The de-risking of the farmer activities, trading between farmers and end users (output 1) and financing transactions between farmers and banks (e.g. outputs 1.1, 1.2 and 4.2) is one major step towards sustaining the financing needs and, it is hoped, sustainable, climate-friendly investments in the agroecosystems in the Valles Macro-region. If implemented correctly, the introduction of a suite of innovative finance products and services (e.g. climate-smart lending and micro index insurance) will ensure access to finance by smallholder farmers, and eventually the micro, small and medium-sized enterprises (MSMEs) business value chains of which these farmers are part. The financial institutions' learning-by-doing approach on climate-smart agrifinancing will become an enabler for the development of more climate finance tools and services for similar financial institutions catering to smallholder farmers and MSMEs (output 4.2).

81. In the first submission for B.34, the independent TAP raised this issue on the potential drawback of a learning-by-doing approach; the limited or poor assumptions of the baseline dynamics on the existing agrifinance markets (e.g. lack of information on the impact of interest rate caps on financial institutions, lessons learned on financing from informal sources) may lead to ineffective financial products and services for the target farmers; such financial tools could be better focused on de-risking of the financial institutions rather than of the farmer transactions. Financial institutions/MFIs may also concentrate on the bankable segments of the farmer population and avoid the poorest and vulnerable and higher risk profile farmers.

82. With the funding proposal resubmission for B.35, FAO addresses this issue by completing a market study on Bolivia's rural agrifinance (see paragraph 33).

83. **Need for governance measures for agroecoystem services**. Water and watershed resources are first and foremost the most important resource in the RECEM-Valles agroecosystem. As climate change exacerbates the critical resources, the introduction of a governance mechanism (e.g. PTDI, territorial platforms for management of water, watershed resources) by which to equitably regulate water and watershed resources for use by all farmers is a key component of the project. Without this, unregulated use would risk inefficient use of water and watershed resources, a rise in territorial area and indigenous peoples conflicts, degradation of water, land/soil and forests due to over-extraction by farmers for survival or expansion needs. Outputs 4.1 and 4.3 address these needs.

[34] See annex 7, table 6: Summary of the recommendations from FPIC [Free, Prior and Informed Consent] workshops.

1.4.1. Risk to needs of recipients

84. If the funding proposal is not carried out properly owing to poor communications and execution of the project components' activities and subactivities, and most of all, a delay in the development of effective financing products/services support as envisioned under the funding proposal, the needs of the recipients will not be fully addressed given the high expectations of the stakeholders. Thus the risk of a return to a BAU situation is likely, especially for the most vulnerable and resource-poor farmers. One mitigating factor for this is the availability of funding for the PTDI. FAO points out that the PTDI is funded by law. The municipalities are obliged by Law N. 777 of the Integral Planning System of the State, to elaborate an annual Territorial Plan of Integral Development (PTDI). This plan includes a budget, whose funds are allocated by the Ministry of Planning.[35]

85. Overall, based on the above, the needs of the recipients are potentially high.

1.5 Country ownership *Scale: High*

86. The RECEM-Valles project is fully aligned with the country's NDCs.[36] The funding proposal supports the implementation of the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth.[37] Other key national climate change initiatives and policies include the Law on Decade of Irrigation 2015–2025, Plurinational Political and Strategy and Action Plan for the Integral and Sustainable Management of Biodiversity 2019–2030 and Law 300 – Framework on Mother Earth and Integral Development for Living Well.

87. The funding proposal has strong government support and representation. The co-financing letters from the key government stakeholders show strong ownership of the projects. MMAyA confirmed the contribution of resources from FONABOSQUE to co-finance the programme (USD 29.5 million sourced from budget resources). Government financial institutions (BDP, FONABOSQUE and INSA) and the local water funds (Tarija Water Fund and Santa Cruz Water Fund) are also directly part of the project.

88. **Ownership and decision-making in the Plurinational State of Bolivia**. The ownership and decision-making aspects of the project must be viewed from the perspective of the Bolivian institutional structure, where ownership is recognized by the three types of institution which coexist in terms of management and representation (public administration, municipal associations,[38] and union organizations[39]). The State Political Constitution (2019) establishes the following: "Bolivia is organized territorially into departments, provinces, municipalities and rural native indigenous territories" (article 269). Two key elements converge in this form of territorial organization: autonomy and decentralization. The following entities, which represent a cross-cutting view of these participating institutions, have been part of the consultations in the formulation of the RECEM-Valles project: the Associations of Communities and/or the Autonomous Municipal Governments of Sopachuy, Sucre, Potosí, Camargo, Tarija,

[35] Independent TAP questions for Bolivia, FAO 16/01/2023.
[36] See: Nationally Determined Contribution (NDC) of the Plurinational State of Bolivia: NDCs Update for the 2021–2030 Period within the Framework of the Paris Agreement.
[37] See Theory of Change, paragraph 77 of the funding proposal.
[38] The Municipal Association System comprises (a) FAM; (b) nine departmental associations of municipalities in Beni (AMDEBENI), Cochabamba (AMDECO), Chuquisaca (AMDECH), Santa Cruz (AMDECRUZ), Oruro (AMDEOR), Pando (AMDEPANDO), Potosí (AMDEPO), Tarija (AMT) and La Paz (AGAMDEPAZ); (c) the Bolivian Association of Women Mayors and Councillors (ACOBOL), whose members are its nine departmental associations; and (d) the Bolivian Association of Municipalities (AMB), whose members are the municipal governments of the nine departmental capital cities and the city of El Alto (Law N° 540, 2014, Art. 2).
[39] "Union Organization", Community System of Association, represented by producers' associations, federations and confederations.

Samaipata and Cochabamba, facilitated by FAO and the Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean. The stakeholder meetings resulted in minutes of the meetings via a certificate of conformity with the consultation process and validity of the project entitled "Preservation and Restoration of Environmental Functions with Emphasis on Water Security for Adaptation to Climate Change and Greater Resilience of vulnerable Family Farmers in the Valleys Macroregion of Bolivia".[40]

89. The presence of FAM – as the organization that brings together urban and rural municipalities – signifies strong local ownership. FAM coordinates with the entire group of municipal autonomous governments involved in the project; it is also the executing entity in the project governance structure (via the Project Steering Committee and the Technical Committee) as well as a co-founding entity.[41] FAM's roles in the funding proposal are consistent with the objectives of supporting the solidarity and equitable development of municipal autonomous governments, capacity-building and information-sharing processes, municipal management strengthening and the creation and coordination of medium- and long-term plans in accordance with the Plurinational State of Bolivia's integral planning.

90. The strong local stakeholder support is also seen from the participation of 65 regional departments of the Valles Macro-region in this programme. According to the stakeholder consultation report (annex 7), these are the regional departments (and their municipalities) of Chuquisaca (16), Cochabamba (26), Potosi' (11), Santa Cruz (7) and Tarija (5). These departments, represented by their autonomous municipal governments, have participated in and sent their technical representatives to the stakeholder consultations;[42] among the indigenous peoples who have given their free, prior and informed consent (FPIC) are the Qhara nation from Chuquisaca (Poroma and San Lucas) and Potosi' (Tacobamba and Puna); the Chuwis nation from Cochabamba (Mizque and Auquile) and Potosi' (Tupiza, Cotagaita and Vitichi); the Karangas Nation from Potosi' (Caiza D and Potosi'); and the Charkas nation from Tuinquipaya. It is important to note that up to 75 per cent of the population of 9 of the 12 municipalities are indigenous peoples. The Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean, in keeping with its experience in FPIC, signed a letter of agreement with FAO to carry out the FPIC process for the RECEM-Valles project. The autonomous municipal governments that were involved in the project preparation stage were Sopachuy, Sucre, Potosi', Camargo, Tarija, Samaipata and Cochabamba.[43]

1.5.1. Risks to country ownership

91. In the first submission for B.34, the independent TAP raised the issue of limited representation and direct participation from the private sector, while there was strong representation from the government side. Private sector representation was mainly seen through FINRURAL and water funds (e.g. Agrarian Union Taquiña Cochabamba, and National Bolivian Brewery).[44]

92. The funding proposal highlighted the limited effectiveness and reach of government interventions in addressing private sector assets/land. Thus, there was a need for direct involvement of the private sector (i.e. financial institutions, insurers and water funds), as it had

[40] See annex 7, stakeholders consultation.
[41] Paragraph 63 of the funding proposal.
[42] These representatives were from the municipal governments, governors' offices, local, regional and national indigenous and peasant authorities from the Confederación Sindical Unica de Trabajadores Campesinos de Bolivia, the Confederación de Mujeres Campesinas Indígena Originarias Bartolina Sisa and the Consejo Nacional de Ayllus y Markas del Qullasuyu (see annex 7 to the funding proposal, section 1.3.2.2, free, prior and informed consent sessions).
[43] See annex 7 to the funding proposal, stakeholder consultation report.
[44] See funding proposal, table 9: Overview of the financial instruments that the project will support to ensure climate resilience and project sustainability.

critical roles to play in de-risking the farmer and agriculture, water and irrigation related transactions via the provision of innovative financial instruments or funding mechanism (e.g. credit and/or risk management tools) as planned under output 4.2. The limited direct presence of the private sector at the project stage could potentially lead to a lukewarm reception; the law capping interest rates in agricultural lending could be a factor creating a lack of involvement by the financial institutions.

93. The RECEM-Valles project emphasized human behavioural changes among the target farmers and entrepreneurs along the agribusiness value chains leading to a shift from traditional to climate-smart agricultural practices; a weak resolve of the farmer could put this change at risk. One mitigation measure to ensure clarity and commitment of farmer participation was securing the collaboration agreements with farmers, outlining exactly the activities in which each would be participating, the rationale for each form of participation, the unique context of their vulnerabilities per project area, and their expressed statement of intent and commitment to participate in the project during the implementation period.

94. Key personnel for this issue were the indigenous peoples specialists; with only three dedicated indigenous peoples experts in the project (for output 1 (2 experts), output 2.2 (1 expert) and Components 3 and 4(none)), the effective facilitation of relevant agreements (e.g. partnership, O&M plan) was at risk owing to potential competing interests of the multitude of organizations and indigenous peoples groups, or communities at the expense of indigenous peoples interests per target project areas.While there was strong local support and participation of autonomous municipalities in the funding proposal during implementation, clear ownership of the funded projects by the participating autonomous municipalities beyond the implementation period was needed. It was not evident then whether there was already an agreement in place that these agroecosystem infrastructure and resources would be funded beyond the project implementation period. Specific documentation to ensure proper budget allocation from these subnational autonomous governments needed to be secured.

95. As part of the resubmission for B.35, FAO has provided adequate responses and draft agreements outlining the differentiated roles and obligations of the stakeholders (see annex X).

96. Based on the above, a high rating is given to country ownership.

1.6 Efficiency and effectiveness *Scale: High*

97. The economic analysis shows that without the GCF grant component, the project does not generate sufficient financial returns for farmers over the 5-year implementation period. With GCF participation, the financial viability hurdle is surpassed; the project generates robust economic benefits over the longer term and, especially from a public perspective, contributes to the long-term sustainability of rapidly deteriorating forests and wetlands in the Plurinational State of Bolivia, and supports the GCF goal of low-carbon and climate-resilient development. The results of the financial analysis show clearly that the project activities would not be undertaken by farmers without GCF support, despite the significant positive externalities and public goods generated by this initiative.

98. **Economic and financial analysis**. The project also demonstrates that a wholistic intervention in the project area, from production to access to markets, from farming inputs to access to climate services, finance and insurance, from climate-proofing of crops to increasing resilience of farmers, ecosystems, irrigation infrastructures, and MSMEs business value chains, greatly increases the sustainability of the agriculture sector and enhances food security.

99. This is demonstrated by the economic analysis. Given a discount rate of 12.7 per cent (as mandated by the government of Bolivia),[45] and a carbon price of USD 40/tCO_2, the RECEM-Valles project shows a positive net present value of USD 4,698,187 for a 5-year period and USD 24,323, 571 for a 10-year period. However, partial or selected interventions (e.g. marketable benefits only) only yield a negative net present value under a 5- and 10-year period (i.e. minus USD 41,634,906 for 5 years and minus USD 22,009,522 for 10 years). As highlighted by the FAO in annex 3 (financial analyses), the project demonstrates that the planned interventions "reduce farmers' climate change-related losses and result in increased financial returns for farmers over the medium to long term, compared to BAU. These improvements provide farmers with a financial incentive to continue the resilience-strengthening activities (including irrigation) and provide increased financial resources to sustain these measures into the future. The farmers' improved and more predictable cash flows also increase their willingness to access productive credit, while the project's emphasis on associative borrowing makes it easier for financial intermediaries to extend innovative lending and insurance products to support continued investment in irrigation systems."[46]

100. GCF grant funds will be used to address 23,400 ha agroecological management areas, 4,448 ha agricultural lands and 17,510 ha areas in prioritized micro-watersheds, totalling 45,358 ha. Given the GCF grant contribution of USD 33.3 million, this investment in resilience translates to a cost of USD 734/ha; this is 2.1 per cent lower than, or almost at par with, the USD 750/ha average cost of improving moderate degraded areas in Latin America but is 45.6 per cent lower than the highest average cost of USD 1,350/ha.[47]

101. GCF grant funds of USD 33.3 million are able to attract USD 30.0 million in-kind resources from MMAyA (USD 29.5 million) and from FAM (USD 0.5 million), or an additional 0.9x of co-financing. GCF grant funds are applied mainly on interventions in (i) Component 1 on climate-resilient agriculture at 100 per cent funding representing 47 per cent for GCF grants; (ii) Component 2 on enhancing farm water security via climate proofing for 24 per cent of total cost using 21 per cent of GCF contributions, (MMAyA covers 75 per cent of cost using 73 per cent of its contribution); (iii) Component 3 on watershed restoration and conservation for 40 per cent of financing cost using 13 per cent of GCF allocations (MMAyA covers 60 per cent using 22 per cent of its contribution); Component 4 on governance and finance for 93 per cent of costs using 11 per cent of GCF contributions (FAM covers the remaining 7 per cent using 60 per cent of its contribution); Project Monitoring and Evaluation for 100 per cent of costs using 3 per cent of grant funds; and Project Management for 53 per cent using 5 per cent of GCF funds (MMAyA covers 47 per cent).

102. GCF grant funds are applied where impact is highest, namely in increasing resilience of vulnerable farmers through climate-smart agriculture and deployment of climate-proofing technologies (Components 1 and 2), enhancing resilience of critical ecosystems (Component 3), and enhancing enabling measures (e.g. financing, insurance, climate information services, climate risk and impact assessments) to de-risk critical points in the agribusiness value chains (Component 4).

103. Project readiness (e.g. completeness of studies, finalization of documents) contributes to effective and efficient implementation of the funding proposal. For the B.35 submission, FAO has adequately addressed the independent TAP issues and concerns raised during the B.34 assessment period in the following areas:

[45] See funding proposal, paragraph 250.
[46] FAO comments on the results of the "In-Depth Baseline Assessment of Farmers in the Valles Macro-Region". Source: OO Matrix revisions made after independent TAP review, 29 November.
[47] See footnote 34, paragraph 250.

(a) Issue on fair and inclusive criteria for selecting target farmer beneficiaries (see paragraphs 33 and 69; see annex 2 feasibility study appendix 4);

(b) Issue on baseline assessment of GHG emissions (see paragraphs 24, 25) in the targeted project areas covered by the funding proposal (see paragraphs 26, 53, 54; see paragraph 32, annex 2 feasibility study appendix 6 EX-ACT);

(c) Issue of a more in-depth baseline assessment of farmers in the Valles Macro-region[48] (see paragraphs 45, 47, 49, annex 2 feasibility study appendix 5);

(d) More granularity on impacts attributable to development and climate change, variability and extreme events[49] (see annex 2 feasibility study appendix 3, Hydrological Assessment);

(e) Execution of an agrifinance market study (see paragraphs 34, 68, 79, 91);[50] (see paragraphs 35, 37, 39, 62, and annex 2, Revised Feasibility Study);

(f) Provision of draft copies[51] of last-mile agreements with farmers, cooperatives and autonomous governments, and collaboration agreements with strategic partners (e.g. BDP, FINRURAL, FONDEBOSQUE, water funds, MFIs, private sector) (see annex X draft of agreements, annex 23 of funding proposal template for agreements on insurance and green credits);

(g) Indicative term sheets of the proposed parametric insurance and green credit facilities for the farmers have been provided giving clarity on the base roles of the farmers and financiers and baseline conditions for eligibility. These are supplemented by questions, responses and discussions during meetings between the independent TAP and AE. FAO confirms, "In the case of the agreement for agricultural insurance, the RECEM-Valles project will work with Instituto del Seguro Agrario (INSA). In these agreements, both institutions, INSA and the municipal governments, play an important role to provide the insurance to vulnerable small[holder] farmers, since INSA finances the insurance with

[48] See assessments in paragraphs. 40,41, 42,44, 46, 48 and 66 of the funding proposal.
[49] See assessments in paragraphs. 48,63 and 64 of the funding proposal.
[50] The study needs to conduct a more in-depth market demand study for financial products and services in the Valles Macro-region or for credit facilities for production focusing on the acquisition of quality inputs (fertilizers, pesticides, seed varieties resilient to climate change) and irrigation (sprinklers), and insurance. The study needs to show key baseline information on the use of informal financing sources from families, traders, producers and suppliers, thus the need to understand how this contributes to the agrifinance markets among the farmers. The feasibility study needs to describe the modes and business cycles of financial transactions for the targeted crops between producers, cooperatives and buyers with identified details of the financial structure and how transactions were provided by the informal and/or formal institutions, especially private sector actors that are members of FINRURAL. The study should also analyse in detail the supply side transactions flow in order to present which of the barriers are linked to climate change or BAU factors (e.g. interest rate caps), and how these identified barriers, especially climate related, could be addressed by the proposed financial interventions under component 4.2. A market study on the proposed financial products and services (i.e. credits, parametric insurance, guarantees) needs to be completed as a whole along with demand and the willingness and ability to pay of the target beneficiaries. The baseline assessment of the agricultural finance subsector needs to be carried out for the current agricultural finance market covering the various agrifinance related products and services offered by formal sources (e.g. FINRURAL members, BDP, financial institutions and non-bank financial institutions) and informal sources (e.g. private money lenders, community, etc.); evidence-based comparative baseline analysis of the financial products or services; interest rates for available tenors; eligible financing activities, collateral, collateral valuation, guarantees, insurance, fees and costs, and regulatory bodies overseeing the particular financial institution or non-bank financial institutions; and relevant laws. The study needs to cover the impacts of climate change, sustainable finance focusing on finance availability (e.g. finance credit/supplier credit lines), accessibility (e.g. credit profile, loan processing, collateral requirements), affordability (interest rates, loan tenors) and acceptability (e.g. alternative versus conventional banking finance products).
[51] The draft agreements with organizations of producers, autonomous governments, and other strategic partners such as BDP, FINRURAL, FONABOSQUE, water funds, and private sector are presented in annex 23 of the funding proposal package.

state money and the municipal governments contribute a percentage of co-financing when the affected areas are under their jurisdiction.";[52]

(h) Term Sheet. Previously, the independent TAP raised the issue of an incomplete Term Sheet. As per the Secretariat assessment report, "The Term Sheet for the proposed Project has not yet been agreed. In accordance with Clause 6.01 of the AMA, all funding proposals submitted to the Board for consideration shall be accompanied by a Term Sheet agreed by the accredited entity and GCF, setting out, in summary form, the key terms and conditions relating to the proposed funded activity. This is a preliminary legal assessment subject to revision based on the review and negotiation of the Term Sheet with the accredited entity." Through this funding proposal resubmission, FAO has submitted a revised and complete Term Sheet;[53] and

(i) GHG baseline and accounting of the relevant agroecosystems and agribusiness value chains and projected emissions due to the funding proposal (see paragraphs 26, 53, 54, annex 2 feasibility study appendix 6 EX-ACT).

II. Overall remarks from the independent Technical Advisory Panel

104. Based on the assessment above, the independent TAP endorses this funding proposal for approval by the Board.

[52] FAO Matrix with revisions made after independent TAP review, 29 November.
[53] See annex 14, Term Sheet.

Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP202)

Proposal name:	Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)
Accredited entity:	Food and Agriculture Organization of the United Nations (FAO)
Country/(ies):	Plurinational State of Bolivia
Project/programme size:	Medium

Impact potential
The AE acknowledges that the overall impact potential is assessed as **high** by ITAP. The RECEM-Valles project has been designed to address the needs of the most climate-vulnerable farmers in Bolivia's Valles Macro-region. The project will promote associativity to foster inclusion and help the most vulnerable farmers (including Indigenous Peoples) to benefit from transformative activities and enhance their access to finance.
Paradigm shift potential
The AE acknowledges that the overall paradigm shift potential is assessed as **high** by ITAP.
Sustainable development potential
The AE acknowledges that the overall sustainable development potential is assessed as **high** by ITAP.
Needs of the recipient
The AE acknowledges that the overall needs of the recipient is assessed as **high** by ITAP.
Country ownership
The AE acknowledges that the overall country ownership is assessed as **high** by ITAP. The RECEM-Valles project is fully aligned with the country's NDCs, the Law on Decade of Irrigation, Plurinational Political and Strategy and Action Plan for the Integral and Sustainable Management of Biodiversity, the Framework on Mother Earth and Integral Development for Living Well, and has been formulated with strong government support and representation. The proposal supports the implementation of the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests and Mother Earth. Finally, the fact that the FAM is a key actor of the proposal will ensure the coordination of municipal autonomous governments involved and strong local ownership.

Efficiency and effectiveness
The AE acknowledges that the overall Efficiency and effectiveness is assessed as **high** by ITAP.
Overall remarks from the independent Technical Advisory Panel: The AE acknowledges iTAP overall assessment and recommendation for the Board approval.

Annex 8

GENDER ASSESSMENT AND GENDER ACTION PLAN

Project

Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)

July 2022

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1. ACRONYMS AND ABBREVIATIONS

ABT	Supervision and Social Oversight Authority for Forests and Land
ACCESOS	Rural Development: Economic Inclusion Programme for Families and Rural Communities in the Plurinational State of Bolivia
AECID	Spanish Agency for International Development Cooperation
AMG	Autonomous Municipal Government
APMT	Plurinational Authority of Mother Earth
BMU	Basin Management Unit
CED	Executive Committee Unit
CEDAW	Committee on the Elimination of Discrimination against Women
CIMDM	Inter-Institutional Committee on the Millennium Development Goals
CCIMCAT	Tarija Education and Research Centre for Rural Women
ENDSA	National Population and Health Survey
ECC	Executive Steering Committe
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
ECOSOC	United Nations Economic and Social Council
FAO	Food and Agriculture Organization
GAP	Gender Action Plan
GCF	Green Climate Fund
GRB	Guadalquivir River Basin
ICTs	Information and Communication Technologies
INIAF	National Farming and Forestry Innovation Institute
INRA	National Agrarian Reform Institute
LDN	Land Degradation Neutrality
LMBMP	Local Micro Basins Management Plan
LWMP	Local Water Management Plan
MDRyT	Ministry of Rural Development and Lands
MMAyA	Ministry of the Environment and Water
OECOM	Community Economic Organization
OIG	Office of the Inspector General
OXFAM	Committee for Famine Relief
PAN	Food and Nutrition Policy
PAR	Rural Alliances Project

PDCG	Guadalquivir River Basin Steering Plan
PICAR	Community Investment in Rural Areas Project
PMU	Project Management Unit
PNC	National River Basin Plan
PNIO	National Equal Opportunities Plan
PTDI	Integrated Territorial Development Plan
SD	Supreme Decree
SDG	Sustainable Development Goals
SEAGA	Socio-Economic and Gender Analysis (FAO)
SENASAG	National Agricultural Health and Food Safety Service
SEPMUD	Plurinational Service for Women and Dismantling Patriarchy
SIARH	Environment and Water Resources Information System
SPIE	State Integrated Planning System
UDAPE	Social and Economic Policy Analysis Unit
UGP	Project Management Unit
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNiTE	United Nations Campaign to End Violence against Women
VIO	Vice-Ministry of Equal Opportunities
VMA	Vice-Ministry of the Environment, Biodiversity, Climate Change and Forest Management and Development
VRHR	Vice-Ministry of Water Resources and Irrigation

2. INTRODUCTION

Climate change impacts in Bolivia are not gender-neutral. The different roles, resources, opportunities and agency of women and men influence how climate change affects and is responded to locally.

Bolivia has achieved important progress towards gender parity in education and access to labour market. According to the Gender Gap Index[1], Bolivia stands at 42nd place for 2020, however some indicators show persistent disparities between men and women and in particular indigenous groups. The gender gap is widest for the economic participation and access to equitable financial resources.

The proposed project, "Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)" aims to strengthen the resilience of agricultural producers in the Valles Macroregion, located in the departments of Cochabamba, Chuquisaca, Potosí and Tarija. The vast majority of this area is rural. The region is inhabited by more than 2.328.741 people, and approximately half of them are women.

At the national level, the project will strengthen Institutions and governance mechanisms related to water management and climate-resilient agriculture to benefit vulnerable smallholders and their communities. Given the water scarcity in the project intervention area, the project will enhance the integrated management of micro-watersheds and the ecosystem services to ensure water provision to rural communities under climate change scenarios. In parallel, the project will design climate resilient agro-system technological packages and provide technical support to smallholder farmers in their adoption to achieve food security. Climate resilient agriculture will contribute to food and nutritional security, leading to climate resilient communities. Women empowered through more dynamic participation in agriculture would result in more gender-neutral food distribution within households and better health for both women and children.

The needs that differentiate women and men within the project are anchored in the access to resources and the low autonomy of women in terms of their personal priorities. The clear sexual division of labour as a barrier to the generation of productive and economic development. Social, cultural, economic and political constraints such as violence at different levels that restrict women's active participation in decision-making processes at family and community level. Identifies key challenges and opportunities within the learning level to promote leadership in different livelihood systems across ecosystem and environmental functions.

The project will promote the distribution of timely information on climate and agriculture as well as sharing of knowledge and skills obtained by famers through Farmer Field Schools (FFS). Given that key gender gaps include education and access to financial assets, the project will seek

[1] http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

to address these disparities through gender-transformative actions to ensure gender equality in the access to trainings, technology and financial services.

The project will also raise awareness on various subjects related to adaptation to climate change, including gender, along the entire value chain – from policy, public administration, education to agricultural input, product, credit and insurance and consumption – so that adaptation to climate change by farmers will be socioeconomically feasible, and hence sustainable.

The objective of the Gender Assessment is to provide the foundation for effective gender mainstreaming in the Green Climate Fund (GCF) project, "Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)" The Analysis examines the socioeconomic conditions of women and men targeted by the project and elucidates gender-specific roles, constraints and needs, thereby allowing a strategic approach to the integration of gender dimensions into the project, summarised as the Gender Action Plan (GAP). The underlying theory of change is: the project will create effective opportunities to empower women through paying sufficient attention to existing gender differences, which will allow communities in the Valles Macroregion to adapt to climate change in a sustainable and equitable manner.

3. BACKGROUND

3.1 Green Fund Policy on Gender Equality

Gender norms and related cultural rules are part of what structures the interactions and reactions to climate threats and opportunities in human systems by influencing roles, expectations, attitudes and behaviors of human beings. Climate change impacts women and girls, men and boys differently because of existing gender inequalities, gender discrimination and social exclusion that could be perpetuated by systemic power imbalances and structural barriers. These often restrict women's and girls' access to and control over resources, legal rights or political participation and decision-making, threaten their peace and security, and thereby undermine their adaptive capabilities. This is why women and girls are often disproportionally affected by climate change as its negative impacts are aggravated by existing gender inequality and systemic and structural patterns of discrimination and social exclusion, which also reduce the effectiveness of sustainable development and poverty alleviation measures.[2]

The Fund's gender policy builds on the existing gender policies and gender action plans of other climate funds. It systematically integrates key principles elaborated in the Fund's own environmental and social Policy (ESP), especially the principles on access and equity, on consideration of marginalized and vulnerable groups and of human rights. It highlights the principle of gender equality and women's empowerment as the goal that the Fund strives to attain through its processes. It acknowledges and integrates the need to apply an intersectional analysis in addressing gender-related differences in vulnerability and ability to decrease vulnerability and adapt to climate change impacts as a lens to understand the complexity and particularity of inequalities in the lives of women and girls, men and boys, including their systemic barriers and root causes. Those are dependent on a multitude of factors such as the economic profile and societal structure of the country or subnational region, specific climate

[2] ANNEX 4 to OPG: Gender policy and gender action plan (Updated version approved in March 2021; Initial GP and GAP approved in March 2016). Page 4

impacts, variety of livelihoods, a host of sociocultural factors such a class, age or race as well as other change processes in societies, such as those brought on by globalization, migration, urbanization and economic development

The Fund's gender policy is human rights-based and congruent with international instruments in acknowledging the centrality of women's rights as universal human rights, in particular with the Universal Declaration of Human Rights (UDHR), the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), the International Labor Organization's (ILO) core conventions, the Millennium Development Goals (MDGs), follow up Sustainable Development Goals (SDGs) and the 2030 Agenda for Sustainable Development. It supports the equal right of women and girls, men and boys to access and benefit from the Fund's resources in order to increase their adaptive capacity and reduce their vulnerability to climate change impacts, facilitating a transition towards a gender transformative approach.

3.2 FAO Policy on Gender Equality

The goal of the FAO Policy on Gender Equality[3] is to achieve equality between women men in sustainable agriculture and rural development for the elimination of hunger and poverty.
In order to achieve this goal, FAO's work will be guided by the following four objectives, which highlight key dimensions to be addressed for promoting gender equality in agriculture, rural development and natural resources management for attaining food and nutrition security for all:

- Objective 1: Women and men have equal voice and decision-making power in rural institutions and organizations to shape relevant legal frameworks, policies and programmes.
- Objective 2: Women and men have equal rights, access to and control over natural and productive resources, to contribute to and benefit from sustainable agriculture and rural development.
- Objective 3: Women and men have equal rights and access to services, markets, and decent work and equal control over the resulting income and benefits.
- Objective 4: Women's work burden is reduced by enhancing their access to technologies, practices and infrastructure and by promoting an equitable distribution of responsibilities, including at household level.

<u>FAO Policy on Gender Equality Strategy and Approaches</u>

The Organization will adopt a twin-tracked strategy for the promotion of gender equality and women's empowerment:

- **Gender mainstreaming:** FAO will ensure that its normative and technical work systematically integrates a gender perspective and responds to the different needs, interests and capacities of women and men. The Organization will also consider other social dimensions that intersect with gender (such as age, marital status, disability status, religion, race, ethnicity, socio-economic status, etc.) and can create and reinforce inequalities, not only between women and men but also among women and among men.
- **Targeted interventions:** When the gender gap is particularly wide, FAO will implement programmes and projects that specifically target women and/or focus on the promotion of gender equality as their main objective.

[3] FAO: Policy on Gender Equality 2020 -2030.

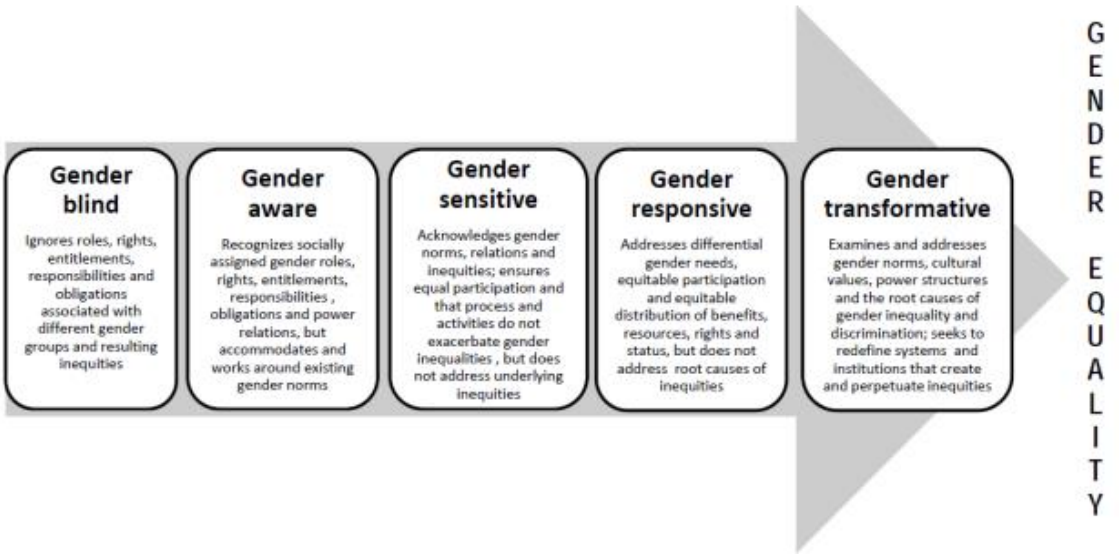
In all cases, FAO will adopt integrated and gender-transformative approaches that not only take into consideration the different needs of women and men but also actively seek to redress unequal power dynamics by challenging the discriminatory social norms, behaviours and attitudes that are at the root of persisting gender inequalities.

Through this Policy, FAO is committed to promote the gender equality objectives in all its mandated areas of work, including agriculture, fishery, aquaculture, forestry and livestock; nutrition; natural resource management; climate-change adaptation and mitigation; emergency response and resilience building; markets, trade and value-chain development; decent employment and the elimination of child labour; social protection; and the empowerment of rural institutions.

4. DEFINITION OF TERMS

The Fund's gender policy makes reference to a number of key gender concepts. They underline and describe the ambition of the Fund's gender approach to achieve increasing levels of gender integration through continuous improvements with the ultimate goal of achieving gender equality in all of its operations. This progress towards gender equality can be illustrated as a continuum of gender integration levels and approaches (Figure 1).

Figure 1: Illustrating the Gender Integration Continuum



(a) Gender: refers to the roles, behaviors, activities, rights, and attributes that a given society at a given time considers appropriate for women and girls and men and boys. In addition to the social attributes and opportunities associated with being male and female and the relationships between women and girls and men and boys, gender also refers to the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes. They are context/time-specific and changeable. Gender determines what is expected, allowed and valued in a woman or a man in a given

context. In most societies there are differences and inequalities between women and girls and men and boys in responsibilities assigned, activities undertaken, access to and control over resources, as well as decision-making opportunities. Gender is part of the broader socio-cultural context and intersects with other important criteria for socio-cultural analysis including class, race, poverty level, ethnic group and age.

(b) Gender aware: refers to the knowledge and recognition of the differences in socially assigned gender roles, rights, entitlements, responsibilities and obligations while accommodating and working around existing gender norms.

(c) Gender balance: refers to the goal of having the same number of women and men in decision-making bodies and among staff in the different levels of organizational structures. (d) Gender blind: refers to the failure to recognize that the roles, rights, entitlements, responsibilities and obligations of women and girls, men and boys are assigned to them in specific social, cultural, economic, and political contexts and backgrounds and result in inequities.

(d) Gender blind: refers to the failure to recognize that the roles, rights, entitlements, responsibilities and obligations of women and girls, men and boys are assigned to them in specific social, cultural, economic, and political contexts and backgrounds and result in inequities

(e) Gender equality: refers to the equal rights, responsibilities and opportunities and access of women and men, boys and girls and the equal consideration of their respective interests, needs and priorities. As gender equality concerns and benefits men and women, boys and girls, not only women and girls but also men and boys are required to fully engage in promoting gender equality and in changing gender roles. Equality between women and men is a human rights issue as well as a precondition for, and indicator of, sustainable, people-centered development.

(f) Gender equity: refers to the process of being fair to women and men, girls and boys. It recognizes the need for potential differential treatment that is fair and positively addresses a bias or historical or social disadvantage or power imbalance that is due to gender roles or norms or differences between the sexes. It is about fair and just treatment that takes into account the different needs of women and girls, men and boys, cultural barriers and (past) discriminations of the specific group

(g) Gender gap: refers to any disparity and inequality between women and men's condition or position or role in society. It concerns inequalities in terms of their participation, their access to opportunities, rights, power to influence and make decision, incomes and benefits, and control and use of resources.

(h) Gender identity: refers to a person's innate, deeply felt internal and individual experience of gender

(i) Gender mainstreaming: refers to a globally supported strategy for promoting gender equality. Mainstreaming involves the process of assessing the implications for women and girls, men and boys of any planned action, including legislation, policies or programmes, in any area and at all levels, thereby increasing the effectiveness of interventions. It is a strategy for making the experiences and concerns of all people regardless of gender an integral part of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres, so

that different gender groups benefit equally, and inequality is not perpetuated. The ultimate goal of mainstreaming is to achieve gender equality.

(j) Gender responsive: refers to the consideration of gender norms, roles and relations and to addressing inequality generated by unequal norms, roles and relations through changes within a given social setting through remedial action.

(k) Gender sensitive: refers to the consideration of gender norms, roles and relations but does not necessarily address inequality generated by unequal norms, roles or relations through remedial action beyond creating gender awareness.

(l) Gender transformative: refers to approaches actively striving to examine, question, and change rigid social and gender norms, cultural values and to address power inequalities between persons of different genders and the root causes of gender inequality and discrimination as well as seeking to redefine systems and institutions that create and perpetuate inequities. The goal of this approach is to transform adverse gender norms and power dynamics into positive ones, thus accelerating achievement of gender equality.

(m) Intersectionality: refers to how gender overlaps with other sociocultural factors, such as race, ethnicity, migratory status, religion or belief, health, status, age, class, caste, sexual orientation, gender identity, and inclusion and exclusion. Looking through the lens of intersectionality is critical for understanding the complexity and particularity of inequalities in the lives of women and girls, men and boys.

(n) Women's empowerment: refers to the process by which women gain power and control over their own lives and acquire the ability to make strategic choices through an expansion of agency throughout women's lives, especially via participation and decision-making. It generally refers to differential or pro-active support to increase:
    (i) women's awareness and sense of self-worth and rights;
    (ii) women's right to have and determine choices;
    (iii) women's right to have access to opportunities and resources;
    (iv) women's right to have power to control their own lives both within and outside the home; and
    (v) women's ability to influence the direction of social, political and economic change to create a more just social, political and economic order, nationally and internationally.

5. METHODOLOGY

The gender assessment draws on the information obtained through consultations with farmers and provincial government officials, gender analyses of the country recently produced, and other relevant information sources – such as research articles, policies and statistics on agriculture, climate change and gender.

Workshops were held in different municipalities in the Valles Macroregion, where the project will intervene to assess the current situation on gender equality in the context of climate change. The workshops were centred on the gender roles in three main themes: 1) Sustainable Farming Systems, 2) Irrigation Systems, and 3) Sustainable Management of Water Sources.

Subsequently, focus groups were conducted with female leaders to explore further specific aspects regarding the family economy, decision making, climate impacts and coping strategies.

Likewise, semi-structured interviews were conducted with key actors from institutions that work in the area.

Finally, the project's logical framework was validated by the same key actors, which has actions and indicators that guarantee gender and intergenerational equality throughout the design, implementation, and evaluation of the project. Additionally, the Gender Action Plan aims to address genders gaps and promote gender and generational equality throughout all of the project's activities.

To the greatest extent possible, the assessment is based on official statistics and published research results pertaining to target districts and field consultations conducted in those districts. Where relevant information could not be found, it relies on that of the rural areas of the target provinces , or of the whole nation. Where no such information is available, the Assessment may refer to the general consensus among the professionals in the field

5.1 Purpose of the Gender Assessment and Action Plan

Conduct a Gender Assessment to identify the main gender gaps affecting the municipalities with which the "Upscaling Ecosystem Based Climate Resilience of vulnerable rural communities in the Valles Macroregion of the Plurinational State of Bolivia" project will be working, and then define a Gender Action Plan that enables the project to contribute to reducing the gender gaps and inequalities.

5.2 Approaches

- **Gender equality**

Gender equality means that women and men enjoy the same conditions and opportunities to exercise their human rights in full and realize their potential to contribute to political, economic, social and cultural development and benefit from the results. It therefore means that society values the similarities and differences between women and men equally, together with the changing roles that men and women play.
This implies that the specific behaviours, aspirations and needs of women and men have been considered, and that these have been valued equally and given the same priority.
In short, the principle of gender equality seeks to ensure that the differences between men and women do not turn into inequalities. Accordingly, the same value and rights are given to everyone, regardless of their biology and the social roles that may be associated with them.[4]

- **Intersectionality**

In discussing intersectionality, the Committee on the Elimination of Discrimination against Women has explained that discrimination against women based on sex and gender is inextricably linked with other factors that affect women, such as race, ethnicity, religion or belief, health, status, age, class, caste, sexual orientation and gender identity. Discrimination based on sex and gender may affect women from certain groups to a different extent or in different ways than men. Therefore, States Parties must legally recognize and prohibit these

[4] Source: FAO: Avanzando con Igualdad: Elementos clave para la transversalización de género en proyectos FAO, 2021.

intersecting forms of discrimination and redress their compounded negative impact on the women concerned (UN, 2010).

5.3 Identify interested parties

The aim is to identify the key actors, describe the process and the input from the consultations that fed into it, and define how the project information, extra consultations and beneficiary and party involvement will be disclosed while the project is being implemented.

Identifying interested parties contributed to the results of the consultations the target population. If necessary, this process will be repeated at the beginning of the project to update the information and have a final version.

Below is a list of all parties interested in being involved in the Gender Action Plan and the actions to mitigate the risks of promoting gender equality.

Table 1: Interested Parties

Interested parties	**Specific interests**	**Effect of the project on their interests (+) (-) (N=neutral)**	**Importance of the actor for the project success: 1= Not important 2= Quite Important 3= Very Important**	**How much actor influences the project 1= None 2= Somewhat 3= Very much**
Ministry of the Environment and Water – Gender focal point	-Implement public policies and plans related to LDN and agrobiodiversity with a gender focus -Support the country's sustainable development and poverty reduction	(+)	3	3
Ministry of Rural Development and Lands – Gender Focal Point	-Implement public policies and plans related to LDN and agrobiodiversity with a gender focus -Support the country's sustainable development and poverty reduction	(+)	3	3
Plurinational Service for Women	-Implement a project that contributes to economic development and poverty eradication pillar of the Depatriarchalization Agenda.	(+)(-)	2	2
Vice-Ministry of Equal Opportunities	-Implement a project that contributes to empowering indigenous women through actions to prevent gender violence	(+)(-)	2	2
Municipal govts. in the project intervention area	-- Integrated territorial devt. plans include the equal participation of women and information disaggregated by sex, age and other variables	(+)	3	3
Female councillors, Municipal Govts.' Human Development Offices	-Implement gender-sensitive budgets and prevent violence	(+)	2	2

Municipal Integrated Legal Services				
FAO implementing agency	-Mainstream the gender approach in LDN and agrobiodiversity projects	(+)	3	3
Women's productive assoc. mixed and youth assocs	-Support the value chain to access the market and improve producers' incomes. Strengthen production skills using good farming practices and increase competitivity of the links in the value chains	(+)	3	2

5.4 Stakeholder Participation

Different consultation and participation events have been carried out with potential project partners and beneficiaries (Appendix 3), from which it was possible to identify the risks involved in project implementation, the expectations of beneficiaries and potential project partners regarding the benefits of the project, as well as the needs and demands of local stakeholders, so that they could be reflected in the scope of the project. These events (workshops, meetings and group and individual interviews) with key stakeholders are important to achieve a highly participatory, socially viable project with a high probability of successfully achieving its goals

The following is a summary of the stakeholders that were part of the Free, Prior and Informed Consultation:

Table 2. Summary of stakeholder workshops

Actors	Place and date	Number of events	Number of participants
Mayors of the prioritized municipalities, municipal technicians, members of social organizations, authorities and technicians of the Government of Potosi.	Ciudad de Potosí-Potosí (18/01/2018)	1	19
Mayors of the prioritized municipalities, municipal technicians, members of social organizations, authorities and technicians of the Government of Chuquisaca.	Sucre-Chuquisaca (19/01/2018)	1	32
Mayors of the prioritized municipalities, municipal technicians, members of social organizations, authorities and technicians of the Government of Cochabamba.	Ciudad de Cochabamba-Cochabamba (24/01/2018)	1	30
Mayors of the prioritized municipalities, municipal technicians, members of social organizations, authorities and technicians of the Government of Santa Cruz.	Santa Cruz de la Sierra-Santa Cruz (26/01/2018)	1	14
Mayors of the prioritized municipalities, municipal technicians, members of social organizations, authorities and technicians of the Government of Tarija.	Ciudad de Tarija-Tarija (29/01/2018)	1	12
Local producers, leaders of social and productive sectors, municipal government authorities and representatives of associations of municipalities.	Tomina-Chuquisaca (07/12/18)	1	40
Local producers, leaders of social and productive sectors, municipal government authorities and representatives of associations of municipalities.	Camargo- Chuquisaca (10/12/18)	1	40

Actors	Place and date	Number of events	Number of participants
Local producers, leaders of social and productive sectors, municipal government authorities and representatives of associations of municipalities.	Vitichi-Potosí (11/12/18)	1	45
Local producers, leaders of social and productive sectors, municipal government authorities and representatives of associations of municipalities.	Ciudad de Tarija-Tarija (12/12/18)	1	25
Local producers, leaders of social and productive sectors, municipal government authorities and representatives of associations of municipalities.	Samaipata- Santa Cruz (20/12/18)	1	25

The free prior and informed consultation of women who are authorities, technical staff and leaders of social organizations is in Annex 3

As part of the gender approach, three groups were prioritized when the stakeholders were identified:

- Key informants, who are municipal and community authorities who have information that is relevant to the project.
- Women community leaders or members of producer associations who have information that is important for the project.
- Men community leaders or members of producer associations who have information that is important for the project.

5.5 Tools

The following tools were used:

- Contextual information, which provides an initial overview of the intervention area, using quantitative data to find out about the local reality and determine how gender gaps can be identified, taking into account variables including education, health, employment and access to natural resources, among others.

- Group interviews, to gather qualitative information of the women. The aim of this was to obtain a gender and generational perspective that would enable gender gaps and inequalities between men and women to be identified within their own context and living conditions.

6. INSTITUTIONAL FRAMEWORK

6.1 Plurinational Service for Women and Dismantling Patriarchy (SEPMUD)

Supreme Decree Nº 3774 of 16 January 2019 mandates the creation of SEPMUD. Its purpose is to monitor, follow up on and evaluate the implementation of public policies aimed at dismantling patriarchy to promote the effective exercise of women's rights.

Its roles and responsibilities include: coordinating with head of sector institutions on the design and implementation of programmes and projects to enable women to access employment, credit, land, technology, information, public services and other elements that help to ensure the

effective exercise of women's rights; and encouraging coordination and linkages between women authorities in central, departmental, regional and municipal government, rural native indigenous entities and civil society, trade union and community organizations for the implementation of public policies.

SEPMUD has developed the Dismantling Patriarchy and Decolonization Agenda 2020-2030, which focuses on seven main areas which will govern actions related to gender in Bolivia over the next ten years: 1) Political rights; 2) Economic rights and poverty eradication; 3) Social rights; 4) Rights to cultural identity; 5) Justice and the eradication of violence; 6) Communication and the right to information; and 7) Young women's rights.

In taking forward the government agenda 2025 and the dismantling patriarchy agenda, the Alliance of Women's Community Organizations for the Democratic and Cultural Revolution held a national consultation with rural native indigenous women. This resulted in a document called "12 proposals for dismantling patriarchy", which covers the following key thematic areas: (1) For a life free from violence; (2) Promotion of dignified employment for women; (3) Valuing unpaid work, with the state and society sharing responsibility for the task of caring for life; (4) Effective access to health care for women; (5) Promotion of sexual rights and reproductive rights; (6) Reinforcing women's rights to education; (7) Reinforcing women's political participation and representation; (8) Strengthening care for Mother Earth; (9) Production with women's participation; (10) Food security and sovereignty; (11) Expansion of the social housing programme and (12) Giving continuity to social programmes

6.2 Vice-Ministry of Equal Opportunities (VIO)[5]

This vice-ministry is part of the Ministry of Justice. The VIO has the responsibility for equal opportunities related to gender, age groups and disability.

The Vice-Ministry of Equal Opportunities is the head of sector institution for the design and implementation of public policies aimed at eliminating all forms of discrimination against women. Compliance with the regulations it draws up is obligatory for the entire public sector, including at the departmental level, through the Departmental Gender Offices or Departmental Gender Units, and the municipal level, with the Integrated Municipal Legal Services (SLIM) that provide support to victims of violence and the Child and Adolescent Defence Offices.

It has drawn up the "National Equal Opportunities Plan – Women Building the New Bolivia for Living Well" (PNIO), which was approved by Supreme Decree 29850 on 10 December 2008. The PNIO's vision is as follows: "In 2020 Bolivia recognizes the contribution made by women to the country's development. This recognition is expressed in equal opportunities to access services, full participation in decision-making spaces and the fair distribution of economic and technological resources and wealth, thus creating the conditions for a life free from gender-based violence."

The PNIO is organized around six thematic areas: (1) Economic, productive and labour issues; (2) Education; (3) Health; (4) Gender-based violence; (5) Citizenship and political participation; and (6) Institutional strengthening.[6]

[5] Plurinational State of Bolivia. Ministry of Justice. Fifth and Sixth Periodic Report by the Plurinational State of Bolivia to CEDAW, 2015.

[6] National Equal Opportunities Plan – "Women Building the New Bolivia for Living Well", approved by Supreme Decree N° 29850 on 10 December 2008.

6.3 Ministry of Rural Development and Lands (MDRyT)

The MDRyT has produced the Plan for the Agricultural and Rural Sector with Integrated Development for Living Well - PSARDI 2016-2020, which takes into account the gender for development approach with the objective of promoting gender equality and equal opportunities for men and women.[7]

6.4 Ministry of the Environment and Water (MMAyA)

The MMAyA has drawn up a Gender Strategy for the purpose of achieving the involvement of women. The main objective of the strategy is to "Establish institutional directives to guide the work of all the actors involved in the irrigation project cycle to mainstream the gender perspective, in order to reduce the inequality gaps that exist between men and women." Its aim is to promote real and effective participation by women in all stages of the project cycle and as active members with decision-making power in the irrigation associations. It also seeks to encourage and motivate professionals who provide technical assistance and support services to adopt the gender perspective and promote attitude changes in families in order to enable men and women to participate under equal conditions.[8]

7. NATIONAL SEX-DISAGGREGATED DATA

[7] Plurinational State of Bolivia. MDRyT: (sectoral policy paper). La Paz, 2017.

[8] MMAyA. Viceministerio de Recursos Hídricos: programa Mas Inversión para riego "MI Riego". Available at: https://www.miriego.gob.bo/enfoque.php?Seleccion=40

Table 3 National statistical Sex Disaggregated data

Population data	• The total population of Bolivia is approximately 11 216 000. 50.7% are women and 49.3% men. (INE 2012) • Women aged 29 to 59 are 32.8% of the population, women aged 60 and over 9.3%. • Of the 3.27 million people living in rural areas, 1 566 271 are women (ENDSA 2012). • 67.3% of women live in urban areas and 32.7% in rural areas. • Four out of ten women are poor. 32% of them are heads of households (INE, statistics with a gender perspective) • With regard to women heads of household, 16.5% of families are single-parent and 33.9% have a woman head of household. This is due to migration from rural to urban areas or abroad, or because the man has abandoned the family, placing the woman and children in a situation of increased vulnerability (2012 Census).
Life expectancy (broken down by gender)	• Women: 75.9 years (Data from 2018) • Men: 69.1 years (Data from 2018)
Maternal mortality rate	• 230 women per 100 000 live births. The causes are: haemorrhage 33%, infections 17%, abortion 9%, hypertension 5%, and prolonged childbirth 2%. (ENDSA 2016) • In rural areas, maternal mortality accounts for 64 of every 100 deaths of women that occur in the country. This sector of the population remains vulnerable, as rural women are four times more likely to die due to complications during pregnancy, childbirth or postpartum. (UN)[9] • In the cities, 42% of births take place at home with a birth attendant and 58% in health centres, while in rural areas 78% of births take place at home with a birth attendant.
Infant mortality rate	• Bolivia records 36 deaths per 100 000 live births. The main causes of death include: infections 32%, premature birth 30%, asphyxia 22% and others. (UN)
Life expectancy (sex-disaggregated)	• Women: 74.21 years [10] • Men: 68.43 years
Health	• In Bolivia, 35.8% of the population goes to public hospitals and 21.8% to health posts. About 57.6% of women aged 15 to 75 go to some kind of institutional health service. However, regarding access to health services for the specific purpose of seeking information about sexual and reproductive health, more than half of women do not receive these services.[11] • Six out of ten women over the age of 15 are mothers. This is equivalent to 58.7%.
Education	• The net enrolment rate in primary school was 82.2%, the rate of completion of year six (the last year of primary school) was 90%, and the gender gap in this same indicator is 1.2% in favour of women. This means that in 2012 more girls than boys finished primary school. The figures are similar for the rate of completion of year 12 (the last year of secondary school), where 5.3% more girls finish secondary school. This represents significant progress. Nevertheless, there are still challenges

[9] http://www.nu.org.bo/noticias/naciones-unidas-en-linea/bolivia-tiene-el-nivel-mas-alto-de-mortalidad-materno-infantil/

[10] https://datosmacro.expansion.com/demografia/esperanza-vida/bolivia

[11] Coordinadora de la Mujer – OXFAM – Conexión – Embajada de España en Bolivia – AECID: Las Mujeres en Bolivia. Encuesta Nacional de Discriminación y Exclusión Social. Análisis estadístico. La Paz, 2014.

	regarding the quality of education and options for the future for young people completing secondary school, especially in rural areas.[12]
Adult literacy rate	• The literacy rate is 96.52% for men, while for women it is 88.58% (UNESCO, 2015). • The following literacy programmes have been launched: the "Yo Sí Puedo" literacy programme and the "Yo Sí Puedo Seguir" post-literacy programme.
Poverty rate	• In 2017, the percentage of the Bolivian population living in extreme poverty was 17.1%. However, the rate of extreme poverty in rural areas was 34.6%.[13] • Extreme poverty affects 44.1% of women and 45.7% of men. Four out of ten women are still living in poverty (INE gender statistics). • With regard to the feminization of poverty, Bolivia had a score of 85.7 on this index in 2018, reflecting a gradual reduction since 2007 when its ranking on this index was 93.2%. (ECLACStat and Gender Equality Observatory for Latin America and the Caribbean 2019)
Participation in the workforce (sex-disaggregated)	• Participation in the workforce in urban areas is 48.2% for women and 66.9% for men. • In rural areas, the rate is 52.5% for women and 75.2% for men. • Distribution of time devoted to care work by women: 23.3% devote 4 to 6 hours to caring for children, 19.4% of women devote 22 to 24 hours to it (full time carers), 15.8% devote 10 to 12 hours, 13.2% devote 1 to 3 hours and 7% do not carry out this type of work.[14] • The consequence of this overload of work, including paid (productive) work, unpaid (reproductive) work caring for themselves and others, and working for the community, is that women are time poor. Women tend to work more than twelve hours a day, completing a double or triple day's work. This makes it impossible for them to fulfil all their responsibilities, meet all society's demands on them and also have time for their own life plans and projects, with the consequent stress, feelings of being overwhelmed, fatigue and lack of expectations.
Employment rate (sex-disaggregated)	The overall rate of employment in Bolivia is 49.5% for women and 69.7% for men, with an average total of 59.5%. This shows that 49 out of 100 women in the population of working age are economically active.[15] • 45.2% of women and 62.8% of men are in work (INE, 2016). • 45.5% of women state that they decide about their own income; 26.2% take decisions with their partner; 8.8% decide together with their father and/or mother, and 11.5% do not have any source of income.[16] • Overall, 41.8% of women state that they are unable to decide how to use their income. Four out of ten women decide what to do with their income, while six out of ten do not take decisions about their income. The main consequences of this are intensified economic dependency and acts of economic and property-related violence. • According to UN Women, women devote four times more hours to household tasks than men

[12] G-77 El Estado plurinacional protege los derechos de las mujeres bolivianas, 2014.
[13] Unidad de Análisis de Políticas Sociales y Económicas (UDAPE) Comité Interinstitucional de las Metas de Desarrollo del Milenio (CIMDM): Octavo Informe de progreso de los Objetivos de Desarrollo del Milenio en Bolivia, 2015.
[14] Coordinadora de la Mujer – OXFAM – Conexión – Embajada de España en Bolivia- AECID: La situación de las mujeres en Bolivia. Encuesta Nacional de Discriminación y Exclusión Social. La Paz, 2016.
[15] INE Encuesta de hogares con enfoque de género, 2018.
[16] Coordinadora de la Mujer – OXFAM – Conexión – Embajada de España en Bolivia – AECID: Las Mujeres en Bolivia. Encuesta Nacional de Discriminación y Exclusión Social. Análisis estadístico. La Paz, 2014.

	• Women earn less than men, including when they are performing the same work. In the primary sector, women earn four times less than men, in the secondary sector women earn half as much as men, and in the tertiary sector up to a third less.
Unemployment rate	• The rate of unemployment is 4.48%. The unemployment rate in urban areas tends to be higher for women than for men. Men: 4.2%; women: 4.9% in 2017. • In rural areas, data from the INE Continuous Employment Survey 2017 show that 73 out of 100 people of working age are "economically active" and the remaining 27 out of 100 people are economically inactive. The unemployment rate for young people is high: the highest is for those aged 18 to 23 at 9.1%, and for those between 24 and 28 at 7.9%. • At the national level, the rate of unemployment is high among young people. It is highest in the 18 to 23 age group at 9.1%, while among those aged 24 to 28 it is 7.9%. • At the national level, 13.3% of women state that they have no source of income; 13.3% of women state that they earn less than Bs. 1 000; 18.4% report earnings of between Bs. 1 001 and Bs. 1 500; and 9.2% of women state that they earn between Bs. 1 501 and Bs. 2 000.[17]
Work in the formal and informal sector	• According to data from INE 2017, 70% of women in Bolivia work in the informal sector. Informal sector work is understood as a subsistence alternative, enabling many women in search of a source of income to cover their family's basic needs, but it also represents an opportunity for economic autonomy.
Land ownership	• According to Article 402 of the CPE, the state has the obligation to: […] b) Promote policies aimed at eliminating all forms of discrimination against women in land access, tenure and inheritance. • Between 2006 and 2017, the percentage of agricultural land owned by women increased from 9.8% to 45% due to the land titling process. 53% is owned by men and 2% by corporate landowners. Prior to the land reform, in rural areas only men were allowed to own land.[18] • The National Agrarian Reform Service Law (INRA) and the Agrarian Reform Law have increased women's access to land by ceasing to make this right conditional on marital status and applying principles of equality to the distribution, administration and use of land (Art. 3 of Law N° 1715 INRA, and Art. 395 of SPC). • Policies on land currently operate on the basis of three main precepts: the decolonization of agricultural structures, equal access to land ownership, and food sovereignty.
Access to tangible and intangible assets	• The Ministry of Rural Development and Lands (MDRYT) has been implementing the ACCESOS programme since 2013, covering 236 communities in 52 municipalities in the nine departments, with funding from IFAD. The programme's objective is to improve the living conditions of rural families and economic units, by means of capacity building, enterprise development and financial inclusion. • Loans are awarded to farmers through the National Farming and Forestry Innovation Institute (INIAF) and the "Accesos" economic inclusion programme for rural families and communities. The area of work included 52 municipalities (out of a total of 339), which transferred funds to priority groups. In other

[17] Coordinadora de la Mujer – OXFAM – Conexión – Embajada de España en Bolivia – AECID: Las Mujeres en Bolivia. Encuesta Nacional de Discriminación y Exclusión Social. Análisis estadístico. La Paz, 2014.

[18] MDRyT at https://comunicacion.gob.bo/sites/default/files/media/publicaciones/BOLIVIA%20COMUNICA%2064-REDES.pdf

	programmes, loans were provided for the purchase of agricultural equipment, and 7% of the women benefited from soft loans for the purpose of modernizing productive initiatives. • Credit was also provided to replace livestock, and 20% of the people who received the loans were women. The sum of 32 million was allocated to benefit 113 families. • 58% of the 3 000 women leaders of grassroots community and territorial organizations were given training on resources to help them cope with climate change. 16 580 young women participated in economic inclusion programme activities. • In the national vegetable growing programme, there were 6 000 beneficiary families and 40% of the participants were women. • During the Rural Alliances Project (PAR), from 2013 to 2017, 35% of the participants were women: 1 700 women and 132 producer associations were beneficiaries. • 15 057 women participated in the Community Investment in Rural Areas Project (PICAR). 136 projects were carried out in 91 communities and 41 direct processing business projects were specifically for women, with more than Bs. 51 million invested in improving project management, developing business administration skills and monitoring public investments. • 719 women and organizations such as the Association of Women Producer Organizations participated in the Camelid Farming Economy Value Enhancement Support Project (VALE). They received technical assistance and benefited from the community management of vicuñas in Calacoto and in Sur Lipez 20% of the vicuña wool and yarn. • The "More Investment for Water" Programme ("MI AGUA" I, II, III and IV, to provide drinking water) has been implemented since 2011 with funds from the National Treasury and international cooperation. Since 2016, the Social Protection Fund (FPS) has managed to spend more than Bs 141.8 million all over the country with 316 projects. • The "MI RIEGO" Irrigation Programme managed to invest Bs 340.4 million in 2016, with 83 projects completed in different communities. This programme accounted for 42% of the investments made that year. It has built infrastructure and irrigation systems for food production with a focus on gender, stipulating that at least 30% of the irrigation system users had to be women. • 534 projects have been implemented around the country, benefiting 62 835 families by installing irrigation systems for food production covering 608 982 000 hectares in the departments of Cochabamba, Chuquisaca, La Paz, Oruro, Potosí and Tarija. • In 2019, 1 117 group registrations were awarded. This means that there are 1 117 legally established irrigation associations in Bolivia, located in Potosí, La Paz, Oruro, Chuquisaca, Santa Cruz, Tarija and Cochabamba.
Food and nutritional insecurity	• Even though women produce between 50% and 80% of the food in Bolivia, they are paid the least for their work in the fields. • In all of Bolivia's departments there are more rural women living in poverty than rural men. The consequence is a feminization of poverty, a situation aggravated by the gender inequalities in access to and management of resources, food and land.[19]

[19] Coordinadora de la Mujer – Observatorio de Género: Mujeres en la construcción de la soberanía alimentaria. La Paz, 2011.

	• According to FAO data, at the household level there is clear evidence that low levels of household income and wealth are clearly related to different forms of malnutrition. For example, the disparity between the richest and the poorest children in Bolivia is more than fivefold. • With regard to the prevalence of undernutrition in the population as a whole, between 2016 and 2018 it stood at 17.5% in Bolivia. This is considerably less than in 2004-2006, when the prevalence of undernutrition stood at 30.3%. • Focusing on children under five, the national level prevalence of emaciation in 2018 was 2%; the prevalence of delayed growth was 16.1%. Likewise, 10.1% of children under five are overweight. These figures are closely related to the quality of the diet among this population group. • The prevalence of anaemia in women of fertile age (15-49) in 2016 was 30.2%. This is a consequence of a poor-quality diet starting in childhood and continuing throughout the different stages of women's lives. • The prevalence of exclusive breastfeeding of babies until they are five months old was 58.3% in 2018. The effect of this low figure is the malnutrition that affects the population of new-born babies in Bolivia, which likewise has repercussions on their subsequent growth and development. • The figures mentioned here are closely related to the type of dependence on staple foods. Bolivia is among a group of countries that are highly dependent on exports and with a low level of dependency on imports of staple foods.[20] • As far as nutrition is concerned, the two sides of malnutrition affect women and men unequally. According to data from ENDSA 2016, the rate of obesity in Bolivia was 25.6%, while 32.1% were overweight, including six out of ten women and five out of ten men. Women aged 40 to 49 are the worst affected.
Domestic violence	• Many women in rural areas are likely to experience violence throughout their relationships with a partner, exceeding the national average by eight percentage points, while the figure for those who have experienced violence in the last twelve months exceeds the national average by three percentage points. The gap between urban and rural areas is 11.2 percentage points for violence throughout the relationship, and 4.7 percentage points for violence experienced in the last twelve months (INE, 2016) • In urban areas, 71.3% of women who are married or in a common law partnership experience intimate partner violence throughout the relationship, which is lower than the national average. 42.9% of these women continued to experience situations of violence in the last twelve months.[21] • By 2021, according to information from the Ministry of the Presidency, there are 108 femicides (65% of the victims are women between 15 and 35 years old), placing the country as one of the most violent against women in Latin America. Likewise, based on data from the Public Prosecutor's Office, 34 cases of infanticide have been reported nationwide in 2021.
Access to social protection	• There is a high level of employment vulnerability and work in the informal sector and a significant concentration in sectors with low productivity, particularly in the

20 Food and Agriculture Organization of the United Nations: The State of Food Security and Nutrition in the World 2019. Rome, 2019.

[21] Instituto Nacional de Estadísticas: Encuesta de prevalencia y características de la violencia contra las mujeres. La Paz, 2016.

	case of indigenous women. 60% of women are working in occupations of this type, compared with 40% of men. • These economic inequalities are directly related to unpaid domestic work and caring for children, older adults and people with disabilities. These tasks essentially fall to women and girls, especially the poorest, creating a vicious circle of informal work and insecure employment.[22] • As a consequence of this situation, women are highly vulnerable and tend to have no access to social protection, especially if they live in rural areas. Underemployment and the type of informal sector work they do means that they have no job stability, health insurance or other benefits.

8. ANALYSIS OF GENDER GAPS AT A NATIONAL LEVEL

8.1 Women's legal status

The text of the Constitution of the Plurinational State of Bolivia (2009) includes an entire section on Human Rights, which takes up all the international treaties and conventions on human rights and the rights of specific groups of people (indigenous peoples, women, older adults and people with disabilities), and gives their rights constitutional status.

The Political Constitution of the State integrates principles regarding the rights of women and men in the following articles:

- Article 11. Prohibition and punishment of all forms of discrimination.
- Article 14. Prevention and punishment of gender and generational violence
- Article 14. II and III. Inclusion without discrimination
- Article 18. Equal political participation.
- Article 147 and Article 210 II. Right to health and social security.
- Article 35.I and II. Right to social security and safe motherhood. I, II, III, IV and V. Right to security. Equal pay for work of equal value. V and VI. Rights of children, adolescents and youth.
- Article 61.I and II. Rights of the family. Article 63.II, Article 64.I and II. Sexual and reproductive rights. Article 66. Gender equity in education.
- Article 79. Jurisdictions of the indigenous native peasant autonomies.
- Article 300, paragraph 30. Competences of municipal governments.
- Article 302, paragraph 30. Financial policy with equal opportunity criteria.
- Article 330.I. Recognition of the economic value of household work.
- Article 338. Non-discrimination in access, tenure and inheritance of land

Bolivia has enacted several **laws that promote gender equality**, such as: Law 348, the comprehensive law to guarantee women a life free from violence, Law 243 against political harassment and violence against women, Law 045 against racism and all forms of discrimination, Law 031, the framework law on decentralization and autonomies, and Law 263, the comprehensive law to combat human trafficking.

In 2010, five fundamental laws established in the Constitution of the Plurinational State were enacted:
Law N° 18 on the Plurinational Electoral Authority, enacted on 16 June 2010

22 Instituto Nacional de Estadísticas: Salarios, remuneraciones y empleo del Sector Privado. La Paz, 2018.

Law N° 25 on the Judiciary, enacted on 24 June 2010
Law N° 26 on the Electoral System, enacted on 30 June 2010
Law N° 27 on the Plurinational Constitutional Tribunal, enacted on 6 July 2010
Law N° 31, the "Andrés Ibáñez" Framework Law on Autonomies and Decentralization, enacted on 19 July 2010

These five laws include the gender perspective, thus achieving significant progress towards guaranteeing women's rights, especially with regard to: i) the principles of gender equality, parity and alternation in the processes of candidate presentation, pre-selection and election to the organs of state; ii) the recognition of political harassment as a crime in election processes; iii) the prohibition of conciliation in cases of violence and the creation of special courts for domestic and public violence; iv) acknowledgement of the importance of allocating sufficient government budgets for the implementation of gender equality policies in the autonomous territorial entities, allocating a minimum of 5% in all plans, programmes and projects at the departmental and municipal level.

All these laws comply with the international human rights conventions and treaties to which Bolivia is a signatory and are oriented towards achievement of the SDGs.

- In 2017 the Multisectoral Plan was prepared to further address gender gaps in the country and boost Women's Right to Live Well.
- In 2018, the 2020-2030 depatriarchalisation and decolonisation agenda was developed and focuses on 7 main areas that will govern gender-related actions in Bolivia for the next 10 years: 1) Political rights; 2) Economic rights and the eradication of poverty; 3) Social rights; 4) Cultural Identity Rights; 5) Justice and the eradication of violence; 6) Communication and Information Rights; and 7) Young Women's Rights.
- Various investment mechanisms and legal and technical regulations have been developed for the implementation of intensive programmes in drinking water, sanitation and irrigation, aimed at achieving an accelerated increase in the coverage of services. It also contributes to increasing the agricultural area, thus supporting the food sovereignty strategy. Although this programme considers the general needs of family farming and economy, it does not systematically mainstream the gender perspective when it should be described in a cross-cutting manner in the institutional principles to be projected in a natural way in the strategies and action plans. In this context, the following laws have been passed in favour of Food Sovereignty:
  - Law 337 (2013): Law to Support Food Production and Forest Restitution: Establishes an exceptional regime for the treatment of land that has been cleared without authorisation and whose beneficiaries benefit from the 'Food Production and Forest Restitution Programme'.
  - Law Nº 300 (2012): Framework Law of Mother Earth and Integral Development for Living Well: Establishes the vision and foundations of integral development in harmony and balance with Mother Earth for Living Well.
  - Law Nº 144 (2011) Law on the Community Agricultural Productive Revolution: Regulates the process of the Community Agricultural Productive Revolution for food sovereignty, establishing the institutional foundations, policies, technical and financial mechanisms for the production, transformation and commercialisation of agricultural and forestry products.
  - Law Nº 071 (2010): Law on the Rights of Mother Earth recognises the rights of Mother Earth, as well as the obligations and duties of the Plurinational State and society to guarantee respect for these rights.
  - Law Nº 031 (2010): Framework Law on Autonomies and Decentralisation 'Andrés Ibañez'. It regulates the autonomy regime by mandate of Article 271 of the Political Constitution

of the State and the bases of the territorial organisation of the State. It establishes the policy of integral rural development and food sovereignty in coordination with the autonomous territorial entities as a competence of the Central Government.

- Law No. 3545 (2006): Law on Community Redirection of Agrarian Reform: Introduces structural amendments to Law No. 1715, providing greater access to land for indigenous communities and small farmers, as it offers greater security of tenure.
- Law No. 3525 (2006): Law on the Regulation and Promotion of Ecological Non-wood Agricultural Production that regulates, promotes and strengthens the sustainable development of Ecological Non-wood Agricultural Production and creates the National Council for Ecological Production (CNAPE, acronym in Spanish) responsible for planning, promoting, regulating, managing and supporting the establishment of programmes and projects, promoting policy guidelines for the development of ecological production.
- Law No. 1700 (2006): Forestry Law that regulates the sustainable use and protection of forests and forest lands for the benefit of present and future generations, harmonising the social, economic and ecological interest of the country.

There is a law that specifically mentions gender and generational equality in its principles:

- **Law N° 338** The Law on Rural Native Indigenous Organizations and Community Economic Organizations for the integration of Sustainable Family Farming and Food Sovereignty mentions gender and generational equality in its principles:

  - Article 7 Clause 6: **Gender and Generational matters**. The obligation to take forward actions that guarantee gender equality, where the family made up of men, women, young people and older adults takes priority, is hereby accepted. The differences and complementarities between these family members are recognized, as is their equal participation in and contribution to social, economic and productive development for Living Well.

  - Article 7 Clause 7: **Inclusion of Rural Young People**. Actions are to be taken forward to promote the comprehensive development of the capacities of young women and men in rural areas, encouraging the transmission of the knowledge and skills held by parents to their children. In addition, policies aimed at reducing migration from rural areas to the city shall be developed, recognizing that young women and men are essential to the development of sustainable family farming in rural communities.

  - Article 7 Clause 9: **Recognition of Rural Women's Contribution to Production**. The productive contribution made by rural native indigenous, intercultural and Afro Bolivian women to sustainable family farming producing food for consumption within the country, food sovereignty, the generation of a surplus and the development of the productive sector, is hereby recognized

8.2 The most common beliefs, perceptions and stereotypes that exist concerning gender

- There have been important legal advances about gender equality in Bolivia since 2009. However, when applying public policies (especially in rural areas), there are still social barriers, stereotypes and beliefs that have made it impossible to advance as desired. In addition to the fact that there is still a lack of means or public and institutional conditions for policy implementation.

- The role of a woman as a food producer, their contribution to the economy of their family and the country, and all related roles relevant to food production, remain undervalued. Additionally, their other roles in organisations and political fields, which they usually undertake without reducing their domestic workload, still goes unrecognised by family members.
- Unpaid work, i.e. care work and domestic work, is mainly women's responsibility. This is governed by the gender division of labour that makes women quasi-exclusively responsible for this type of work, which has not changed even after the inclusion of women into the labour market and their generalised status as household income providers.
- Women are usually in charge of activities in the rural sectors, especially in the highlands and the valleys, due to temporary migration of men or the strategy of combining family economic activities in both rural and urban areas.

Family violence persists and despite support services being offered, the number of violence victims is increasing.

8.3 The labour division between women and men

- In rural areas, the tasks that fall almost entirely to the female population are care work and domestic work. Women dedicate an average of four times more than men to housework in addition to nearly 38 hours to agricultural work or the labour market, while men dedicate 47 hours (World Bank).
- There is a higher tendency for men to migrate and look for salaried jobs. In these cases, women tend to be in charge of the traditionally male responsibilities in rural communities, which increases their workload and allows them to be a part of the community's decision-making process. Men taking over traditionally female roles, including domestic and reproductive tasks, is rare. The local communities see a change in traditional roles as a temporary change rather than a permanent transition, which means that women are usually seen only as a "replacement" for a man. At the same time, they are not available (because they have moved away, are sick or have died).

8.4 The participation of women and men in the formal and informal economy

- Among the most important barriers when considering communities and peoples' productivity, is that the assignment of job profiles to women because of their condition as 'women' continues to be perpetuated, a segregation that causes more than 57% of the options for vocational training, trades and jobs continue to be considered as an extension of their maternal role in care and reproduction, which is why we find them providing service and care to others. Therefore, women are normally excluded from prestigious and powerful educational circuits, despite the growing feminisation of some trades and professions, within which there is a new sexual division of labour with the inclusion of men to higher levels of specialisation and women to non-specialised training or specialisations related to areas considered to be of weak or average aptitude.
- When comparing the 1976 census with the 2012 census, women who are currently of working age and looking for work in the labour market represent 49% of the economically active population, while 40 years ago, this percentage was only 20%. An increase that is due to need rather than to employment opportunities in the labour market.
- Women are paid less than men for doing the same type of activities. In the primary sector (agriculture, cattle raising, mining) women earn five times less than men, especially in rural areas. In the secondary sector (transformation and industry), they earn two times less and in the tertiary sector (services), they earn 1.5 times less.

- Female dominated responsibilities are undervalued in economic terms in comparison to traditional male work. The roles that are typically designated as female are often less valued than those designated as male. Women are generally expected to fulfil the reproductive role of bearing and raising children, caring for other family members, and household management tasks, as well as home based production. Men is more engaged in productive roles, particularly paid work, and market production.
- In the labour market, although women's overall participation rates are rising, they tend to be confined to a relatively narrow range of occupations or concentrated in lower grades than men, usually earning less. Historically, women's productive roles have been ignored or under-valued, particularly in the informal sector and subsistence agriculture.[23]
- Inequality in women's work and time is expressed in working conditions, especially in wages and discrimination in the market. At the rural and peri-urban level, women have a wide participation in productive work without leaving aside their reproductive role; however, as we pointed out, production work is not recognised.
- According to studies carried out in 2016 by the Women Coordinator[24], just a 1.6% of women earn more than BOB 4001, a figure that shows the precariousness of the work that is one of the main characteristics of female worker, whose income is among the lowest in the Bolivian society as a whole. Women define their economic situation as follows: 71.4% rate it as average, 20% as good, and 8.4% consider it to be poor.
- A 45.5% of women say that they make decisions about their personal income and 26.2% say that they decide jointly with their partner. In 8.8%, their father and/or mother decides and 11.5% have no income. A 41.8% of women do not decide on their personal income; therefore, it can be stated that 4 out of 10 women decide on their personal income and a similar number do not decide on their personal income.

8.5 The situation of men and women in the project area

- Gender-based roles are predominant. Men tend to play the role of community representative and decision-makers, perform physical labour in the agricultural sector, and engage in higher-value economic activities such as mining, wood production, cattle raising, etc.
- On the other hand, women are responsible for domestic tasks (cleaning and cooking), reproductive activities and care work, and other activities such as ensuring the fuel and water supply. Women feed their families through subsistence farming and raising cattle near their homes, allowing them access to a small-scale income. Their role as food providers makes them dependent on natural resources and a healthy environment, which is why they are the first to be affected by climate change.
- The division of labour means that women tend to be less valued when it comes to an economic framework. It also suggests that, in general, women can only access community decision-making processes "through" the men.
- Women do not have the same level of access as men to assets such as land or services like loans and education. This is a disadvantage given the growing number of women that now find themselves as the head of household.

8.6 The access to water in the project area and how is this affecting men and women

[23] Ashwill, Maximillian and Morten Blomqvist, et al. (2011). "Gender Dynamics and Climate Change in Rural Bolivia", The World Bank, Washington D.C.

[24] The Women Coordinator is a network of 21 non-governmental organisations with nationwide coverage. (coordinadoradelamujer.org.bo)

- In the Department of Cochabamba in the provinces of Campero, Mizque, Esteban Arze, Carrasco, Germán Jordán, Arani, Quillacollo, Chapare, Punata, Arque, Esteban Arze, Capinota, Punata and Tapacarí, it is observed that access to drinking water in homes is mostly through mains pipes and public pools, and although basic sanitation is ensured in the different populations, poverty rates are high, with a high incidence of women, and this has an impact on the poor redistribution of productive and adaptation tasks, with the possibility of empowering women and adolescents in these regions and carrying out prevention work with girls (see Annex 4, Cochabamba).
- In the provinces of Vallegrande, Florida and Manuel María Caballero, in the municipalities that are part of the study, the level of poverty is coherent with the high presence of secondary water sources, such as water carts, wells, rain, rivers, springs, irrigation ditches, among others. This means that the drinking water connections that reach women as reproducers and replicators of resources for their communities and families are monopolised in certain urbanised areas and do not benefit the majority of women living in these study areas, which is why a better distribution of access to the various existing basins is required. (See Annex 4, Santa Cruz)
- In Chuquisaca in the provinces of Tomina, Zudañez, Yamparáez, Oropeza, Azurduy, Belisario Boeto and Nor Cinti, in spite of having drinking water connections, with around 70 % of participation in household water sources, rain, rivers, springs and ditches continue to be used as sources to meet the water needs of the households of women in the communities that are fed by the study basins. It is pertinent to note that poverty levels are high in these areas, with around 60% poverty, which would require that, following field research, access to water be optimised as these degrees of need are reflected in the group of women in the participating municipalities.
- In Potosí, in the provinces of José María Linares, Tomás Frías, Chayanta, Nor Chichas, Sur Chichas and Cornelio Saavedra, it has been established that at least one third of the population has access to piped drinking water, and in some municipalities it reaches 74 % of the population. However, there are high levels of poverty in these municipalities, which indicates a low level of training of women and certainly a large gap in the division of tasks segregated by sex, since despite having a large number of direct drinking water connections, this has not contributed to improving the quality of life, which is why there is a demand for interventions in watersheds to be better distributed with training and empowerment of community women in order to promote the economic and production activities they carry out and consequently the productivity of the province. The generation of spaces with gender-neutral capacities will naturally be reflected in the level of women's resources and the impact on their families.
- In the provinces of Cercado, Méndez, Avilés and Arce there is a strong component of access to water from rain, rivers, springs and ditches, but the levels of poverty are not as high as in other departments with similar circumstances, so the field study should focus on economic activities in which the water resource managed to maintain a certain balance between the areas of the poor and the non-poor. In this respect, women in the municipalities included in these provinces show that also between 40% and 50% of them have sufficient access to all water sources. (See Annex 4, Tarija)

- The croplands, pastures and forests within the Project area are increasingly exposed to threats from climate variability and climate change. Climate change in turn threatens to undermine progress towards achieving the Sustainable Development Goals (SDGs), especially those related to hunger, poverty reduction and ensuring environmental sustainability on a level playing field.
- In the study municipalities of the departments of Cochabamba, Chuquisaca, Potosí, Santa Cruz and Tarija, it is necessary to have a strategy that links access to water, agricultural production and the preservation of forest areas, considering that the presence of rivers, lakes and springs are reduced, thus implying knowledge of the sources of water for plants and trees in the study areas. Agricultural women will only improve their condition if they are aware of the balance between agricultural production and forests, as well as the role of the water resource in achieving this balance.

8.7 Strategies for women and men to adapt to climate change

- The strategies of adaptation employed by women and men to climate change differ significantly due to the division of labour and existing gender differences in the control over resources.
- While men focus on large-scale community interventions (for example, irrigation, river defences) and migration or employment as day labourers, women tend to centre more on practical and innovative improvements such as searching for alternative water sources, protecting local assets, planting new crops, or on complementary traditional initiatives through other local activities. The analysis shows that men tend to adapt to climate change by using more resources while women adapt by using resources more efficiently.
- Women's burden of work is the main barrier to promoting female participation in training and adaptation projects in the face of climate change. Research in this field has shown that women already have too much work in Bolivia's rural areas. The situation is deteriorating due to climate change, migration, and natural disasters. This means that women have little time to participate in new development projects, adapt to climate change, technical training and other related production activities.

8.8 Inequalities that may be exacerbated by the impact of climate change

- The different activities that men and women carry out in their roles and tasks to provide for themselves and their families depend on natural resources availability. Women, particularly in rural areas, spend a lot of time obtaining food, water, fuel/energy for sustenance, the livelihood, health and well-being of their family, which requires natural resources that are well managed and a suitable environment. Climate change is a threat to all of these factors since it has severe impacts on food, water and other natural resources such as wood and other energy sources.
- In the past few years, the east of Bolivia has seen a rise in floods, rain, and heatwaves. The west is experiencing a reduction in available water sources (more droughts, variable levels of rainfall). All of this has had an impact on available food sources. These impacts directly affect the lives of women and men, particularly on their capacity to ensure their survival in all its forms, including water and food security.

- For women in rural areas dependent on natural resources, these effects are detrimental and exacerbated in female-headed households. Unequal access to resources and decision-making processes has also magnified these adverse effects.
- Women are more vulnerable to natural disasters due to their socially constructed roles and responsibilities and their social, economic and political status, which is lower than that of men. They also tend to have limited mobility, which means that they are left in charge of household responsibilities. Thus, if the water is polluted, which usually causes diarrhoea and illness in children, there is more pressure on women as their families' caregivers.
- Another impact of climate change is migration because global warming reduces the possibilities of survival since water and fertile soil are prerequisites for those living in rural areas. Generally, men migrate in search of job opportunities, while women are left in charge of the family and production.
- Women play an essential role in natural resource management due to the particular knowledge about natural resources and the environment. They contribute to adaptation to climate change by resorting to different survival strategies when facing a crisis. They are the ones that transfer knowledge within their group and between different generations, which is necessary to ensure their survival and finally, they have experience of a vast number of plants used to treat illnesses.
- This is why the more equitable the division of labour – where women play an active role in decision-making, power relations in natural resource management and access to knowledge – the better they can respond to the environmental changes threatening them.

8.9 Inequalities that exist between different social groups that affect the capacity to adapt to climate change.

- In general, the project's beneficiaries in the municipalities of the Valles Macroregion of Bolivia are in poverty condition (on average 42% of the population in the region).
- However, given the context, there are not climate-related factors that accentuate the vulnerability of these communities. For example, limited economic resources, food or shelter. Some individuals from the same community are more vulnerable than others, for example, women in general, even more so if they are pregnant, children, older adults or have disabilities. Therefore, their adaptive capabilities are differentiated.
- Bolivia has made significant legal progress for different vulnerable social groups. However, equality policies have not yet been implemented in rural areas, only welfare measures (stipends).
    - With regards to women, there has been progress made regarding access to land tenure. However, they still lack control over natural resources and their family's income. Very few have access to loans and information regarding their rights as citizens, and there is still a lack of access to technologies and training. These have a negative influence on women since they are in charge of taking care of their children, grandparents and family members with disabilities. The Plurinational State of Bolivia is a signatory to the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), the agreement was ratified by Law No. 1100. Undoubtedly, an important issue in this convention is the recognition of women's land rights. Under these considerations, in 1996 this recognition became effective in agrarian matters, with the approval of Law No. 1715 of the National Agrarian Reform Service, which in its Article 3 ratifies the elimination of all forms of discrimination against women in their right to access to land tenure, an article that is also ratified by Law No. 3545 of Community Renewal. At present, within the framework of the policy to fight climate change, in the Nationally Determined Contribution 2022 - 2030, presented by the Plurinational State of Bolivia to the climate convention, it has been

established as an important goal until 2030, to complete 100% of the regulation of agrarian property, The baseline of women with legal land tenure rights by 2020 is at least 641 thousand titled and with agrarian property rights, i.e. 31% of all titled and regularized land. Through this Law, women and men, living together in the same family unit have the same rights, half and a half, to land tenure and property rights

  - In this sense, the RECEM Valles Project will contribute to the effective and full use of this right of agrarian property over land, ensuring the empowerment of women farmers who are heads of household, who in rural areas account for 31.5% of all producers.
- Young people (both men and women), not finding adequate means of subsistence, lack of access to paid employment, lack of higher education options, and other reasons, tend to migrate to urban areas to be a part of the informal economy.

8.10 Roles of men and women. Implication in terms of time and need for mobility.

- The project will work with beneficiary families from different municipalities. Mechanisms will be established to guarantee the active and effective participation of women. Based on the context and supported by the country's laws and equality policies, women and their specific needs are considered a priority. Women tend to be permanently in the communities and, therefore, often become responsible for the day-to-day management of their families and natural resources. This does not mean that more responsibilities will be added to their regular tasks and roles. Instead, it is intended that participatory methodologies will be implemented for both men and women, which will promote intuitive processes about the democratisation of roles. The project will additionally consider gender-relevant aspects such as distances to be travelled, the time allocated to training and the support needed, for example, by implementing mobile nurseries (for babies brought by their mothers).
- Alliances will be made in the territory with institutions that promote gender equality, such as the Gender Units in the municipal governments, NGOs that work on gender, the Associations of Women Counsellors of each municipality, grassroots organisations, such as the National Confederation of Indigenous Peasant Women of Bolivia-Bartolina Sisa, and others. This way, at least 30% of participants will be women, guaranteed in each project cycle. This will imply a specific budget.

8.11 Access to resources (economic, financial, physical, natural and others) by men and women. Management and control of these resources

- Generally, men have access to tangible resources, meaning land, water management, irrigation, production systems, paid work, loans, technology, and intangible resources such as technical assistance, training, and education. Men manage these recourses and make decisions about how they are used and controlled.
- Generally, women do not have access to the tangible or intangible resources previously mentioned, even though their work in the agricultural sector is fundamental to the family's survival (the type of work that remains invisible). Care work and domestic work are governed by the sexual division of labour, making women quasi exclusively responsible. This has not changed even after their insertion into the labour market and their general condition as household income providers.
- This inequality and unjust division of work prevents women from accessing better jobs, higher income and employability conditions, participating in politics and being recognised as active economic entities.

8.12 Equal access of men and women to information and opportunities to participate in and benefit from the results expected from the project.

- The project will promote both men and women's participation, using positive action criteria to guarantee that at least 30% of participants are female. Following this, conditions will be established to facilitate access, control and management of resources.
- Family work will be promoted as a catalyst for the local economy and to encourage more equitable relationships. We will work with female heads of households and young people to produce changes within their communities.
- A participatory methodology is proposed for the different actors participating in this process. Therefore, the project will consult both men and women.

8.13 Equal access of women to education, know-how and/or training

- Access to school education has been one of the most discussed issues in terms of cross-cutting state policies and still remains one of the most important points to be taken into account from the central governmental lines in order to effectively alleviate inequality. It is important to highlight that in the last 12 years there has been real and convincing progress at the national level in terms of women and access to education[25], but even with such evident progress, there is still insufficient progress in specific areas of feminised discrimination, in this case indigenous women of all ages and in rural areas.
- The statistics obtained in rural and urban areas covering the project's footprint through the study on the Situation of Women in Bolivia [26]ratify the trends of the national data from the last two censuses with reference to a progress and increase in the level of women's educational status. The study indicates that one out of every 10 women between 15 and 35 years of age is illiterate; two out of every 10 women between 36 and 55 years of age; and almost 7 out of every 10 women aged 56 and over. These gains are at basic and primary levels.
- According to the 2012 census, the net enrolment rate at the primary level was 82.2%, the completion rate for Year 6 year was 90% and the gender gap in this same indicator favours women by 1.2%. This means that in 2012, more girls than boys finished primary school. We can also see this trend about the gender gap for Year 6 of secondary school's completion rate, where 5.3% more girls finish secondary school.
- The literacy indicator of the population aged 15 to 24 years has risen since 1997, reaching 99.4% in 2014.[27]
- These are significant progress; however, there are challenges about the quality of education and future options for populations that complete secondary schools, especially in rural areas. Men tend to access technical training since there are usually no other higher education opportunities in the municipalities or pushed to migrate to urban areas if they wish to continue with their studies.
- Women tend only to finish high school and generally get pregnant at an early age not to continue their education.

8.14 Availability and access to Project services and technologies for both men and women

- Generally, women gather natural resources and products from the forest and have a unique knowledge of these and other related habitats' flora and fauna. Thus, their participation in

[25] Between 2001 and 2013, school attendance among 6–9-year-old increased nationally from 78.3% to 83.45% for females. On 21 December 2008, UNESCO declared Bolivia an illiteracy-free country.

[26] National survey on discrimination and social exclusion. Women's Coordinating Committee. 2014

[27] G- 77 The Plurinational State protects the rights of Bolivian women, 2014

the design, development and implementation of this project is vital for its success and for the overall conservation of the habitat.

- This is why the project will be gender-responsive. When designing the project, it took into account sex-disaggregated information, women's participation to know their needs, and their capacity and limitations when it comes to their access to tangible and intangible assets. Therefore, positive affirmative actions will be proposed so that women are considered the main participants in this project, especially women who are heads of household.
- This project's implementation proposal considers mainstreaming the cross-cutting gender perspective through objectives, products, actions, and indicators that can measure women's effective participation. Joint responsibility of work will be sought within the families so that women are not especially overloaded.
- Different tools will be available in this project to guarantee equal participation of men and women:
  - It will take a community-based human rights approach, which strongly depends on equal and meaningful public participation (mainly through women's empowerment in the rural areas where the project will work).
  - The gender and climate change situation will be researched and gender and climate change analysis policies, programmes, and initiatives from the project intervention area.
  - A minimum quota (30%) will be assigned to participate in female beneficiaries and decision-makers for project accountability.
  - Budgets for climate change policies and initiatives will be considered within a gender-responsive framework.
  - Training and technical assistance services will be available for both men and women. It will use the "learning by doing" methodology, the appropriate time and location, and the language spoken by the group to guarantee the participation of women.

8.15 Access to credit of rural women

Article 5 of Law 338 concerns the “Intensification of the democratization and diversification of the financial system, prioritizing the development of the productive sector and the demand among historically excluded producers, as well as food sovereignty and security, with a focus on gender and sustainability”.

In addition, Supreme Decree Nº 2310 of 25 March 2015 establishes Group Credit for Women Producers, including rural women:

> “Single Article.- Women who work in the productive sector, in rural and urban areas, may access loans in the form of the product called “Group Credit for Women Producers,” established as part of the Trust Fund for Productive Development, as authorized by Supreme Decree Nº 29145 of 30 May 2007.”28

It is also relevant to mention the credit line known as “BDP Woman Head of Household,” introduced by the Productive Development Bank (BDP).29 This is a credit line designed especially for women engaged in productive activities who are seeking to improve or expand their business. The loans can be awarded to groups of producers (solidarity-based credit) or individuals and must

28 FAOLEX, available at: http://extwprlegs1.fao.org/docs/pdf/bol144227.pdf

29 https://www.bdp.com.bo/notas-de-prensa/banco-de-desarrollo-productivo-lanza-jefa-de-hogar-bdp-para-apoyar-a-las-mujeres-bolivianas-.html

be used to strengthen productive activities or for business development by women who are the household breadwinner, with the aim of increasing their income and the wellbeing of the family.

However, in the municipalities where this project will be working, credit is inaccessible for both men and women, due to the guarantees that have to be presented and the high rates of interest.

8.16 Women's participation in food security

Bolivia has enacted Law N° 3525 (21 November 2006), the Law on the Regulation and Promotion of Ecological Farming and Non-Timber Forest Products. This led to the creation of the National Ecological Farming Council (CNAPE), which regulates, promotes and strengthens the sustainable development of ecological farming and non-timber forest products in Bolivia. This is based on the principle that, in order to combat world hunger, it is not merely a question of producing more food. It is also necessary to ensure that the food produced is good quality and safe for human consumption, that biodiversity is preserved, and that the food is affordable and available to everyone. This means that food production, processing, industrialization and marketing processes must not cause a negative impact or harm the environment.

The government policy on food sovereignty also supports an increase in the productivity of family farming (certification and control of seeds, mechanization programme, agricultural insurance). It seeks to respond to the needs of vulnerable groups by means of social benefits in the form of "**conditional cash transfers**" (the Juana Azurduy benefit, the Juancito Pinto benefit and the Dignity Pension for the elderly), which facilitate access to food and safeguard the purchasing power of the beneficiary households.

- The Juana Azurduy benefit (SD. 066 of 3 April 2009) provides cash transfers to pregnant women and mothers or carers of children under two, provided that they make use of preventive health services during pregnancy, that the birth is attended by skilled health staff, and that they take the children for health check-ups until their second birthday. The total amount of the benefit is Bs 1 820 (USD 261) over 33 months.

- The Juancito Pinto benefit (SD. 28.889/2006) aims to promote school enrolment and attendance until primary schooling is completed, by providing households a cash transfer conditional on their children being enrolled and continuing to attend school. The amount per schoolchild is Bs 200 (USD 28.7) per year. The benefit is paid throughout primary school in the formal education system, the alternative education system and the special education system.

- The Universal Old Age Pension (Law 3791 of 28 November 2007) is a lifetime, non-contributory pension that the Bolivian state provides to: i) All Bolivians over the age of sixty who are resident in the country and who do not receive a pension from the long-term social security system or any other income from the National Government Budget. The amount per year is Bs 2 400 (USD 345); ii) All Bolivians who receive a pension from the long-term social security system, who are only entitled to 75% of the amount of the Universal Old Age Pension; iii) Those entitled to receive a benefit to cover funeral costs.

Furthermore, Article 17 of Law 338, the "Law on rural native indigenous economic organizations – OECAS and community economic organizations – OECOM for the integration of sustainable family agriculture and food sovereignty", stipulates that one of the obligations of the Plurinational State of Bolivia with regard to sustainable family agriculture is to promote "effective access by women to the components of production with equal opportunities and in equal conditions, and

particularly access to credit to enhance production and specialized technical and technological education" (clause 11).[30]

The country also has a Food and Nutrition Policy (PAN)[31] based on legislation governing the human right to food and food and nutrition security with sovereignty. One of the key thematic areas of the PAN acknowledges that in Bolivia, women are the cornerstone of family farming, agricultural work and the family's day-to-day subsistence. Women are the main food producers; they participate actively in the labour market and are solely responsible for the family's nutritional status. However, they face obstacles preventing them from being able to carry out their tasks effectively due to their limited access to and control over resources (land, water, credit, agricultural inputs) and services (education, technical assistance, health). Elimination of these restrictions will enable women to realize their full potential to contribute to reducing food insecurity in the country. It is therefore recommended that gender equality be systematically integrated or mainstreamed in all Food and Nutrition Policy programmes.

Based on the above, it can be concluded that there is a favourable legal framework and policies in place that recognize the role played by women in food and nutrition security. Accordingly, their participation in technical training, access to technology, access to agricultural credit and access to markets (among other areas) must be promoted.

Rural women are usually involved in small-scale agriculture: 41.8% (Atlas of Rural Women) and they know how to select and adapt plant and crop varieties. They know how to choose certain varieties that are resistant to pests and diseases, which has enabled them to adapt to soil and climate conditions. They know about the nutritional and medicinal properties of plant species, how they taste and how easy they are to cook, as well as food processing and storage. Family agriculture is therefore a key ally to promote sustainable development and eliminate hunger, obesity and all forms of malnutrition.[32]

Nevertheless, at technical and institutional levels there is still a failure to recognize the responsibilities that women take on, their management practices and their knowledge of how to conserve and improve animal and plant resources. This is why their interests and needs are not usually taken into account in local planning and decision-making.

It is for this reason that the project acknowledges the different contributions and responsibilities of men and women and proposes to give priority to working to enhance women's access to resources, training, extension services and appropriate technology. It will also promote women's active participation, as beneficiaries, as partners and in decision-making.

One area to which special attention will be paid is to create the conditions for women to participate in equal conditions as men, taking into account the constraints they face as a result of being solely responsible for looking after the home and the family, with the consequent lack of time for doing other types of activities that strengthen their economic autonomy.

8.17 Women's participation in climate change adaptation actions

Bolivia has enacted Law N° 071 on the Rights of Mother Earth and Law N° 300, the Framework Law on Mother Earth and Integrated Development for Living Well. This led to a Supreme Decree

[30] FAOLEX, available at: http://extwprlegs1.fao.org/docs/pdf/bol120900.pdf
[31] S.D. 2167 Food and Nutrition Policy - PAN (30 December 2014)
[32] FAO Focus: La Mujer y la seguridad alimentaria. Available at: http://www.fao.org/FOCUS/S/Women/Biodiv-s.htm

creating the Plurinational Authority for Mother Earth (APMT). This agency is responsible for formulating and implementing the Plurinational policy and plan on climate change, and developing, managing and implementing policies, strategies, plans and programmes for climate change mitigation and adaptation in the country.[33]

However, the legislation does not differentiate between the roles of women and men. The climate change adaptation strategies they use differ due to the division of labour and their differing degrees of control over resources.

While men focus on large-scale community interventions (irrigation and river defences, for example), as well as seeking employment as day labourers or migrating temporarily, women tend to focus more on searching for alternative sources of water, protecting local assets, planting new crops, implementing family vegetable gardens, or initiatives to complement traditional sources of income such as making crafts using seeds from the forest and other local activities.

Women's overload of work is one of the main barriers making it difficult to promote women's participation in climate change adaptation projects and training, together with the persistent patriarchal structures that do not value the roles women play to safeguard the family's subsistence.

Environmental deterioration increases the number of hours that women must devote to collecting water, firewood and plants, and reduces their capacity to guarantee their family's wellbeing and food security. Women have valuable knowledge about how this deterioration has happened, what impact it has had on their lives and how it can be remedied.

In their role as food providers, women are highly dependent on natural resources and a healthy environment. This is why they are the first to be affected by the impacts of climate change, which have been increasing in recent years due to drought, hail and frost.

8.18 Participation of women and men from vulnerable communities in decision making processes

- There are social, cultural, economic, political and institutional barriers that restrict women's participation in the families and the community:
- **Social:** Household tasks and decisions (reproductive roles), which mainly occur in the private sphere, are assigned exclusively to women, whereas productive activities, decisions and representing the family and community occur in the public sphere and are assigned primarily to men. This division of labour by gender already places men and women at different starting points. It allows for discriminatory practices to occur within the family, community, and the state and market levels.
- **Cultural:** Although women work progressively more in the agricultural sector and guarantee food security to their families, these communities' agriculture is still considered an occupation only for men. Women are considered to be "helpers," which is why it is regarded as invisible labour. This cultural reason has led women to be discriminated against when it comes to inheriting land. Land ownership was passed from fathers to sons, assuming that only the men could perform the required agricultural activities to maintain it. Since the new SPC, women have access to land ownership; however, there are still problems with the control, use, and land administration.

[33] Supreme Decree Nº 1696 Regulations on the role and responsibility of APMT

- **Economics:** Bolivian rural women are a fundamental pillar of family agriculture, their participation in agriculture is 41.8%. They work in crops, caring for small livestock, forestry, market their products and are responsible for the nutritional status of the family. However, they still face access barriers regarding productive resources: land, water, credit, agricultural inputs, training, technical assistance and decision-making. In addition, they perform unpaid and family care work.
- **Institutional:** Civil servants with no gender-sensitivity training are still managing public institutions. Furthermore, indigenous organisations are fronted by male leaders who, when exercising their leadership, maintain a gender bias. Since the new SPC, changes have been implemented where there is a required 50% participation of women in these instances. However, this has brought problems such as discrimination, abuse and violence against women.

8.19 Opportunities to promote women's leadership in local governance/political systems and formal/informal institutions

- The SPC promotes women's leadership in local governments and in political and institutional systems through laws implemented by the Plurinational Electoral Organ that guarantee women's rights, especially regarding parity and alternation in candidate presentation processes, preselection and election of the different organs of government. Therefore, there is an important representation of women in local governments in the Departments (assembly) and in the municipalities (councillor).
- The restrictions that exist for women to assume leadership roles include: (i) the lack of experience they have working in public management sectors, (ii) lack of knowledge of laws, (iii) the mockery and harassment they endure from their fellow male counterparts, not being able to delegate their domestic roles and being overburdened with work, (iv) experiencing domestic violence because of having to attend meetings and travel, among other aspects. However, there are laws that have been enacted to protect them from these discriminatory situations that need to be better disseminated for them to be more broadly applied For example, Law 243, Law against harassment and political violence against women

8.20 Gender-based violence

Gender-based violence not only hurts the victim but also their family and community. Violence against women is not confined to a specific culture, region or country, nor to particular groups of women in society. The roots of violence against women lie in the persistent inequality and discrimination against women. (UNETE, 2010).

Gender-based violence is one of the greatest scourges in the everyday life of thousands of women in Bolivia and around the world, because it violates the fundamental rights to life and wellbeing of many of the people who make up half the population and because it damages the social fabric.

Law N° 348, the Comprehensive Law to Guarantee Women a Life Free from Violence, entered into force in Bolivia in 2013. Eight years after this legislation was enacted, the figures on violence against women are continuing to rise, and Bolivia is one of the countries with the highest rates of femicide in Latin America.[34]

34 According to figures published by the Attorney-General's Office, 33 cases of femicide were recorded in the country from January to 19 April 2021. The departments with the most recorded cases are La Paz (8), Cochabamba (7) and Santa Cruz (6). In 2020, 113 femicides were reported.

In general, in rural areas the domestic violence is naturalized. Even though there are support services such as the Integrated Municipal Legal Services (SLIM) and the Child Protection Offices (DNA), which work to prevent violence and offer support and protection to victims (usually women, children and adolescents), women do not tend to report violence due to the fear of reprisals from their partner, because they do not find the support they need in these legal advice institutions, and due to the cost of travelling to the town.

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8.21 The differential needs/priorities of woman and men in the project´s context

Based on stakeholder consultation during the conducted workshops, men and women expressed their needs for adaptation. Table 2 presents a summary of the identified needs.

Table 4. Priority needs for men and women

Women	Men
– Participatory planning in the project – Women's leadership training – Water recollection systems with solar panels (women collect water for their families to use) – Training and technical assistance in the value chain process – Support for productive enterprises led by women – Strengthen Indigenous Women's Organisations – Install efficient stoves for energy (women are the ones collecting firewood to be able to cook) – Solar panels to dehydrate fruit – Bee hives for the beekeepers – Family gardens, green houses – School gardens – Markets for the sale of products – Healthy menus – Nurseries for organic products – Seedlings – Community-based tourism (Samaipata) – Promote the rights of women to access natural resources and land – Promote the rights to access information, public participation and decision-making processes – Promote access to justice systems to prevent domestic violence	– Reforestation – Animal health – New sustainable agricultural technologies – Technical assistance for the management of pesticides and fungicides – Technical assistance for the management of cattle – Anti-hail nets – Access to irrigation systems (drip-irrigation, reservoirs) – Improve road infrastructure – Access to loans – Support marketing products – Waste treatment to prevent river pollution – Transformation training – Forage production – Livestock management – Soil recovery – Well drilling – Management plan for protected areas (water sources) – Irrigation ditches – Micro-irrigation systems – Collection centres – Fair trade centres – Specialised transportation for different products

– Promote the right of young women and women in general to education – Disseminate the laws that favour women in the country – Access to credit for women producers' associations – Increased access to information technologies – Expand training areas	– Early warning systems – Disaster tolerant crops – Water sources enclosures – Water trainings – Strengthen irrigation-based organisations – Support in the form of investment projects – Programmes to finance young people's business ventures – Work placements in public and private institutions

- It is essential to consider that women from the rural areas are diverse, considering what life-cycle stage they are currently at, their ethnicity, the types of activities they are involved with: farmers, gatherers, fisherwomen, or other non-agricultural activities, among others, the type of labour relationships they establish: self-employed especially in the agricultural sector, as paid workers in agricultural and non-agricultural sectors and unpaid workers. Despite their diversity, they all experience subordination regarding gender relationships and their assigned roles, which are culturally established by society. These aspects shape the diverse inequalities that exist towards women and determine that they spend more time on domestic and care work activities than men.
- However, women who previously only appeared as target groups, vulnerable and only important in their reproductive role, are now being considered from a more integrated perspective by focusing on their economic, social and cultural rights. Furthermore, the sexual division of labour is also being considered, primarily through social protection policies.
- Thus, the project will provide technical assistance to establish agro-productive systems. For this, actions have been identified to benefit women and men equally and specific activities such as the construction of efficient wood stoves or access to water supplies, which will impact women and men differently. Technical capacities will also be provided to women about agricultural activities to help them adapt better to climate change

8.22 The needs of specific (vulnerable) subgroups been considered in the project

- These subgroups have not been considered as direct intervention populations in this project. However, when working with whole family units, these subgroups will become indirect beneficiaries.
- It is important to mention that women acquire important visibility once again when being considered strategic actors in the project since it is they who are usually in charge of caring for the children, older adults, and family members with disabilities. These actions are known as 'caregiving'**.**
- The unequal distribution of time within the households between men and women goes against women's autonomy and overall food security for the family. It is a fact that women's productive work outside the home is not carried out under equal conditions, which leads to an unequal distribution of time dedicated to paid and unpaid work, and to domestic and care work. The incorporation of men has not accompanied rural women's incorporation into the labour market into the domestic and the caretaking world. This has seen to be predominant when there is a sustained increase in households led by women and an increase in the

population's life expectancy, which forces a large number of older adults to depend on their family.

- Key data on the vulnerable populations:

Children: Almost 3 million children live in Bolivia, 51% are male and 49% are female

- Safe potable water is vital to assure infant survival and avoid malnutrition, malaria and diarrhoea. Currently, 1.6 million children under the age of 5 die from these preventable diseases. Furthermore, the lack of water will cause more drought and an overall reduction of crops; this will lead to a lack of food, affecting the most disadvantaged areas.

Older adults: They represent 8.1% of the total population in Bolivia, 37% of the rural areas, and 51% are women.

- Currently, the average age in the country is 27. However, the population pyramid follows a decreased base, while there is continuous growth in the centre and the top sections.
- Older adults are particularly vulnerable to the effects of climate change due to their reduced mobility and overall lack of strength, visual and auditory impairment, higher vulnerability to changes in temperature, and less capacity to gather food. They also need 24/7 support to access the health care system if they suffer from chronic illnesses such as diabetes.

People with disabilities: They are particularly vulnerable because they need help to access safe potable water, food supplies, and shelter.

8.23 The different vulnerabilities of both men and women

- The effects of climate change manifest in the increase of extreme climate conditions, such as warmer summers, droughts, and storms and floods that cause the loss of crops. Faced with these types of disasters, which have increased in frequency and intensity in the last few years, the poor have been the most affected. Women are mostly affected not only because of their low income (less than men's) and because they bear a disproportionate amount of the workload due to climate change. This is because women's marginalised status means that they are subjected to a direct dependence on natural resources to cope with their domestic duties, which includes collecting water, firewood, and fodder. Furthermore, climate change has caused a scarcity in resources and makes traditional forms of employment less reliable, which has pushed people (men) to migrate, leaving women from the rural areas with double the number of tasks about agriculture and domestic labour. Simultaneously, women who live in poverty have less access to and control over natural resources, technology and loans. All these limitations mean fewer possibilities to cope with climate change and other associated disasters.
- Based on these findings, some response actions proposed by the project include:
  - Developing an effective and comprehensive environmental education programme for the communities, to change unsustainable habits will be reflected in a reduction of environmental crimes such as thinning, burning practices for agriculture and forest fires, as well as an increase of civil participation where women will be part of prevention, conservation activities and conservation activities.
  - Days, times and places for training will be considered, in consultation with the availability of time and mobility of the women. It is also possible to establish mobile day care centers for young children.

8.24 Use of knowledge and skills of women and men from vulnerable populations to contribute to project results.

- Currently, the participation of the Bolivian women in the agriculture EAP is 41.8%, meaning that women are responsible for a high percentage of food production for domestic consumption. Food sources become more unpredictable and scarce because of climate change, which is detrimental to the living conditions of people. However, women's knowledge and experience in maintaining biodiversity through the conservation and domestication of wild edible and medicinal plants is crucial to effective adaptation to climate change.
- Men, in general, possess vast knowledge and already have productive skills – because they were able to access training and knowledge, which will strengthen women's participation. This way, there will be complementary participation for both men and women in the project's activities.

8.25 Equitable opportunities and actions to challenge gender stereotypes and increase positive gender relations

- Gender stereotypes respond to the patricidal culture that justifies or even "allows" men to exercise violence against women (in Bolivia, 7 of every 10 women suffer from some type of violence is their lifetime) when the purpose is to "correct" behaviour that is out of the norm and which does not fit within their role as a mother, wife and housewife. This culture also justifies any man's power to intervene or control women by using different types of violence against a woman who "defies" or transgresses the cultural boundaries of gender. [35]
- The project will challenge the roles assigned to men and women by re-valuing women's contributions to the overall family economy to strengthen their role as producers, allowing them more access to technical assistance and training decision-making processes and technology. It will also work on the idea of co-responsibility within the homes. Furthermore, the project will coordinate with local authorities and social organisations and influence public policies regarding the allocation of gender-sensitive budgets. Finally, it will work towards the prevention of all forms of gender violence.
- Some of the actions will be in the exchange of experiences between female producers' organisations, their participation in the preparation of adaptation plans to climate change, in emergency drills, among others.

9. PROJECT FORMULATION AND IMPLEMENTATION PRINCIPLES

The project builds on best practices and lessons learned of past adaptation-focused interventions in Bolivia that have had a transformative impact on enhancing the resilience of smallholder farmers to climate change. The project aims to restore ecosystem functions and services at on-farm and micro-watershed level, improving crop productivity, enhancing water resource management practices amidst the threat of recurrent drought and other climate events (e.g. hail and frost), managing competition for depletion and pressure on scarce natural resources, and building capacities of rural communities against the adverse effect of climate change on food and water security and sustainable livelihoods. These approaches will impact on ecological but also social resilience, which is a major underlying goal of the Joint Mitigation and Adaptation Mechanism for the Integrated and Sustainable Management of Forests and Mother Earth. All this will be achieved through mainstreaming gender equality and promote gender transformative path to increase climate resilience.

To achieve this the project is considers key principles for its design and implementation. The project will monitor and evaluate its achievements via qualitative and quantitative sex

[35] ONU MUJERES, Annual Report 2012, p. 12

disaggregated indicators. The key principles and proposed gender transformative actions include:

9.1 Strengthening female technical community

The number of female professionals is limited in disciplines that have traditionally been considered masculine, such as irrigation, land and water management, climatology, information technology, agriculture sciences, and animal and veterinary sciences. The project resiliency of women, young people, and men through equal opportunities to access technology, training, technical assistance, and decision-making to prepare for, adapt to, and mitigate the effects of climate change. The project will engage female professionals and train young female professionals on climate resilient practices to support the project's implementation. During the training process: Disseminate the legislation that supports the equitable participation of women. This way, the project can help avoid the situations of violence that tend to occur inside the homes when women assume productive and decision-making roles.

9.2 Leveraging gender-differentiated tasks and interests

Women and men are largely engaged in different tasks, and women are more willing to take up new practices. They also have stronger interests in food and nutritional security. The project will leverage these differences to introduce new agricultural products for diversification and for food and nutritional security, both of which will boost resilience to climate change and improve the health of all household members. Most importantly, children's health and development, in which balanced nutrition plays a critical role, will be positively affected.

The project has planned to work with women farmers' associations, for which the minimum criteria are:

- Identify associations made up of women
- Identify the products of the association
- Support the formation of its board, then with its legal personality
- Implement the "Learning voy Doing" methodology and consult with them about the days and times when they can be trained.
- Design graphic support materials that are easy to use.
- Develop didactic material with graphics and simple language.
- Provide training in the value chain, basic accounting
- Provide technical assistance
- Support with supplies, equipment and technology

9.3 Provide training in leadership, self-esteem women's participation in coping with negative shocks

The poorest households lack viable means to cope with shocks that climate change has brought about. The project will help women acquire the capacity to increase food available to each household by means of kitchen gardens to minimize the risk of having to consume less expensive food items or to eat less altogether. If the products yield cash income, it would supplement finances required for the reconstruction and repair of damages caused by floods. In addition, endowing women with the ability to bring cash home is considered the surest way to empower them.

9.4 Assisting women in initial investment

The lack of access to financial resources by women poses a great obstacle to adopting climate resilient agriculture, which includes vegetable production and animal raising. The project will aid in lowering the barrier by providing seed packets and other assets and support women learning how to grow vegetables and raise and care small animals. This assistance will free women, who receive the material for starting a new venture, from the need to borrow from commercial lenders in the informal sector, at least in connection with the new activities; the association with them is often linked to perpetuating poverty.

9.5 Personalized technical advice and capacity building

Farmers will be specifically trained through the Farmer Field School (FFS) system to understand climate-resilient farming techniques and understand the exposure to climate hazards posed by subsistence and monoculture farming systems in the face of climate impacts. The ECA will enable the rapid dissemination and adoption of resilient technologies and practices and contribute to the decentralization of extension services. In addition, capacity-building sessions will be held for agricultural to improve their knowledge of climate risks, climate information and how to plan for adaptation. Capacity and technical advisory services integrate a transformative and gender-sensitive approach through the adoption of participatory strategies to ensure women's active participation and improved access to knowledge and technology and improve their economic situation through the use of climate-resilient technologies.

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Capacity and technical advisory services integrate a transformative and gender-sensitive approach through the adoption of participatory strategies to ensure women's active participation and improved access to knowledge and technology, and to improve their economic situation through the use of climate-resilient technologies.

9.6 Promotion of an equal distribution of productive and reproductive tasks between men and women

Despite the wide range of agricultural work they carry out, women are subordinated in gender relations and are assigned subordinate roles culturally determined by the local society. This gives rise to the various inequalities that affect women and it means that they devote more time to domestic tasks and care work than men. This is why women are considered in the project based on a more integrated approach, focusing on their economic, social and cultural rights. Accordingly, the project will provide technical assistance, having identified actions that benefit women and men equally and specific activities for the social and economic empowerment of women and young people.
Women tend to stay in the communities, while men leave in search of work. This means that women often become responsible for the day-to-day running of the family and natural resource management. The use of affirmative action criteria to work with them does not mean that the project will add even more responsibilities to their regular tasks and roles. Instead, the aim is to

use participatory methods to work with both men and women, which will promote intuitive processes to make roles more democratic, and this process will be accompanied by training on masculinities for men and on gender for women.

9.7 Equal participation

- The project will work with beneficiary families from communities. It will put in place mechanisms to ensure that women can participate actively and effectively, under the principle of Free, Prior and Informed Consent. Based on the assessment and with the backing of the laws and policies on equality in the country, women and their specific needs are considered a priority.
- The project will promote the participation of both men and women, using affirmative action criteria to ensure that at least 30 percent of the participants are women and at least 10 percent are young people throughout the entire project cycle. Next, it will put the conditions in place to facilitate their access to, control over and management of resources.
- Family labour will be promoted to boost the local economy and foster more equal gender relations. The project also proposes to work with women heads of household and young people to bring about changes in their communities.
- Project design took into account sex-disaggregated information and women were involved in order to find out their needs, capabilities and constraints associated with their access to tangible and intangible assets. Affirmative action measures will therefore be proposed to ensure that women participate in this project, especially women who are heads of household

9.8 Improving women's access to information

Women do not have good access to information and information technology, and despite the inclusion of the topic gender in various policies, new initiatives are launched without the consideration of gender, especially of rural women's strengths and constraints. The project will raise awareness among policy makers and community-support professionals on women's access to information: its importance and the need for its improvement. Radio broadcasting on climate resilient agriculture will consider rural women as an important audience and produce programs that specifically target them. The establishment of female farmers' networks would also contribute to improving women's access to information.

9.9 Sustainability through gender inclusion

The project aims to set up structures that guarantee the governance of the project by receiving help to implement and evaluate the project from technical committees of local authorities and social organisations, with a minimum participation of 30% women and 10% young people. The project will promote the sustainability of actions through governance processes such as strategic alliances (Women councillors from the municipalities and Women leaders of grassroots organisations such as the National Confederation of Indigenous Peasant Women of Bolivia-Bartolina Sisa) to access economic resources from gender-sensitive organisations. Additionally, the project will include local governance through public policies that have gender-sensitive budgets and support other policies that contribute to reducing gender and generational inequalities, violence against women and social exclusion.

Likewise, the Plurinational Service for Women and Depatriarchalization will be part of the Project's Steering Committee.

9.10 Communication strategy

This strategy will be worked within the framework of communication for development (diagnosis and local participatory design) which has as its main focus the dissemination of knowledge of the topics addressed by the project, where special emphasis will be placed on equal opportunities for men and women, in addition to the recognition of the co-responsibility of care work, the democratization of roles and the prevention of gender violence.

9.11 Monitoring and Evaluation

- The monitoring and evaluation system will seek to ensure that all the indicators at the project beneficiary level are disaggregated by sex and age. It will also measure the qualitative indicators proposed in the Gender Action Plan and the consultations with the indigenous population.
- The monitoring and evaluation system will be able to produce reports on the budget allocated for reducing gender gaps and inequalities in the project, and thus contribute to participatory accountability.

9.12 Strategic alliances

- At the national level, alliances will be promoted with the ministries involved and the Plurinational Service for Women and Dismantling Patriarchy to implement policies, plans and agendas related to the thematic areas to be addressed by the project, with gender equality criteria.
- In the territory, alliances will be made with institutions that promote gender equality, such as the Human Development Directorates, the Integral Legal Services in the Municipal Governments, the Associations of Women Councilors in each municipality, and grassroots social organizations. Advocacy will be sought for the implementation of gender-sensitive budgets in the MGAs.
- At the territorial level, alliances will be forged with institutions that promote gender equality, such as the Human Development Offices, the Integrated Legal Services in the municipal governments, the Association of Women Councillors in each municipality and grassroots community organization. The project will seek to advocate for the implementation of gender-responsive budgeting in the AMGs.

Awareness-raising on gender equality will be taken forward with technical staff in government institutions and the general public, increasing men's access to information about gender equality and encouraging the construction of new masculinities, thus contributing to the sustainability of the project's work

10. GENDER ACTION PLAN

The outputs and activities proposed in the Gender Action Plan for the "Upscaling Ecosystem Based climate Resilience of vulnerable rural communities in the Valles Macroregion of the Plurinational State of Bolivia" project contribute to the targets of SDG 5, as described below.

The project's contribution to SDG 5

The project fits with Sustainable Development Goal 5 (among others) and, for the purposes of this document, mention will be made of this SDG: "Achieve gender equality and empower all women and girls". Putting an end to all forms of discrimination against women and girls is not just a basic human right; it is also crucial for sustainable development.

The targets for Sustainable Development Goal Nº 5 that the project will help to achieve when it is implemented are the following:

5.1 End all forms of discrimination against all women and girls everywhere.

5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.

5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of women and girls at all levels.

The Action Plan for addressing gender in the project is aligned with the Global Environment Facility's Policy on Gender Equality and the FAO Policy on Gender Equality. It will also help to operationalize the national policies on gender and dismantling patriarchy in the Plurinational State of Bolivia.

This Plan seeks to ensure that the project achieves the expected results in terms of closing the gender gaps considered a priority, through **gender mainstreaming.**

The day-to-day implementation of the Gender Action Plan for the project, *Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles),* will be led by a full-time project-recruited Gender Specialist. Although the Gender Specialist will lead the implementation of the Gender Action Plan, they will do so in close collaboration with other project-recruited staff who will lead day-to-day delivery of project activities at the regional and municipal levels.

The Gender Action Plan (GAP) through the Update on Gender Data in the Project's areas of action to be done at the beginning of the project, ensures that indicators are gender responsive so that they will track gender- related changes over time; this including across all outcome areas, not just those focused on gender equality or women's empowerment issues. The monitoring and evaluation of the set indicators and targets will employ both qualitative and quantitative data collection methods to contribute to the triangulation of results and to capture change that is difficult to measure. In addition, it will seek to capture qualitative lessons learned and best practices through narrative reporting – sometimes these lessons are the most significant for achieving change and are the most difficult to discern.

The Project includes the participation of women as a priority and equitable manner; it will be ensured that gender mainstreaming is found in all project activities. However, in order to work with more direct and transformative actions, at the beginning of the Project, a baseline of the project will be drawn up and then gender indicators and targets will be incorporated into the Monitoring and Evaluation Strategy to measure and report progress in reducing gender inequality gaps. Likewise, the communication strategy will accompany the implementation of the Project, making progress visible and systematizing good practices with a gender perspective in the project. To consolidate sustainability and advocacy with a gender perspective, special emphasis will be placed on involving and strengthening the capacities of government counterparts at the national and subnational levels. The baseline will also provide more accurate information for proposing gender-responsive actions.

The project will seek to strengthen the participation of adult and young women across the board, including leadership and decision-making roles. This will ensure that at least 30% of project beneficiaries are women. If necessary, positive affirmation criteria will be used to ensure the equal participation of all stakeholders and a personal and economic **empowerment strategy** will be developed, which will include: i) participatory methodologies to ensure leadership

opportunities and influence on women's decision making through capacity building on issues related to gender roles, self-esteem, leadership, information on laws that are favorable to gender equality in the country. ii) training in the topics addressed by the project, technical assistance and access to technologies on the part of productive associations led by women. The criteria to identify that the Associations are led by women are that they are Associations formed only by women and also mixed Associations, whose board is composed of 50% women.

Also, all the tools and training support materials developed in the project (access to information, access to financial education, adaptation to climate change and others) will be reviewed so that they are developed considering the intersectionality of the women to whom they will be destined.

In component 1, the project will build capacity and implement climate technologies and climate-resilient agroecological and organic practices to address vulnerability and increase productivity of agricultural systems. It will promote climate-resilient value chains by providing technical assistance, inputs, training and certification to community-based productive associations, prioritizing those led by women, to enable them to diversify their livelihoods, access markets and generate income.

In component 2, the project will promote small farmers' access to water resources with improved irrigation systems, encouraging women, especially those who are heads of household, to access family and community water reservoirs, and to be trained in field schools in the implementation of climate-proof irrigation systems.

In component 3, a CC adaptation strategy will be developed with a focus on conservation and restoration of micro-watersheds, where women will be able to participate in micro-watershed water use plans. A water source monitoring system will also be developed and it is expected that women will be trained in the use of this information to make decisions on the use of water resources for agriculture and other uses.

Component 4, will strengthen local governance structures for participatory planning of climate adaptation and fund mobilization, where financial mechanisms will be specified that consider rural women's accessibility to financial information and to productive and irrigation credit portfolios, as well as their participation and leadership in territorial consultative platforms for integrated and resilient water management and sustainable production systems.

The project is aligned with the Green Fund's Gender Policy, which systematically integrates the key principles elaborated in the Fund's own Environmental and Social Policy (ESP), especially the principles on access and equity, on the consideration of marginalized and vulnerable groups, and on human rights. It highlights the principle of gender equality and women's empowerment and recognizes and integrates the need to apply an intersectional analysis to address gender-related differences in vulnerability and capacity to reduce and adapt to the impacts of climate change.

The Project also aligns with the FAO Gender Equality Policy objective of achieving equality between women and men in sustainable agricultural production and rural development for the elimination of hunger and poverty. Women should be able to participate on an equal footing with men as decision-makers in rural areas, in institutions and in the development of laws, policies and programs. In addition, both should have equal access to and control over land and other productive resources, decent employment and income, goods and services for sustainable agricultural development, and for markets.

The gender marker is from the responsive approach of the Green Fund, which addresses gender differential needs, equal participation and equitable distribution of benefits, resources, rights and status, but does not address the root causes of inequalities. [36]

10.1 Funding for the activities

Including specific actions and indicators in the project log frame components to reduce the inequality gaps identified in the Gender Assessment guarantees that the actions have sufficient funding to be implemented, and also that they will be reported in the project's M&E system. Some actions will have a general budget and will have to allocate at least 30 percent to the target population (women). Other specific actions that will contribute to affirmative actions to empower women will have specific budgets (as can be seen in the Gender Action Plan attached here).

10.2 Support of a gender specialist during project implementation

A gender specialist must be hired monitor the "Upscaling Ecosystem Based Climate Resilience of vulnerable rural communities in the Valles Macroregion of the Plurinational State of Bolivia" Project and ensure that gender equality is mainstreamed throughout it by: being responsible for focusing on supporting actions to empower women; improving the Gender Assessment; consulting with women from the communities; training the technical staff and the beneficiary population; forging strategic alliances with government institutions and indigenous organizations; supporting the communication strategy and the M&E system; working to mitigate the risks involved with promoting gender equality; ensuring that the reports mainstream gender throughout the good practices and lessons learnt; and other tasks.
It is also planned to hire a specialist in masculinities, to support in update on gender Data in the Project's areas of action and then in a sensitization plan with the men who are part of the project promoting co-responsibility for care work within families.

10.3 Table Work Plan

Notes to the table Workplan:

- At the start of the implementation, baseline disaggregated data will be collected through a survey. Some of the indicators will also require, by means of verification, mid-term and final data to be collected in the field to ensure that sex disaggregated indicators can be properly monitored
- In the Funding Proposal, as well as in the Annex 2, Feasibility Study (Annex 4), the direct beneficiaries have been identified as heads of households. The same definition has been maintained here in this work plan
- On women-led households: The head of the household is usually responsible for all or most of the household expenses or deciding how to spend the household income and is not necessarily the oldest member of the household and may be male or female[37]. A female head of household refers to a woman in charge of managing the

[36] Gender-responsive approaches: recognize and address the specific needs and priorities of men and women, based on the social construction of gender roles.
Concrete expression: Gender is relevant, but not the main objective of the project. Gender is integrated (mainstreamed) in all relevant project dimensions (results, activities, monitoring framework).
[37] Javed ZH, Asif A. Female households and poverty: a case study of Faisalabad District. Int J Peace Dev Stud. 2011;2(2):37–44.

family as a result of divorce, separation, immigration, or widowhood[38]. The numbers of Bolivia indicate that 30% of the households are women-led[39].

- On women-led farmer associations: Women-led smallholder farmers associations have at least 60% women in the board of these associations.

[38] Javed ZH, Asif A. Female households and poverty: a case study of Faisalabad District. Int J Peace Dev Stud. 2011;2(2):37–44.

[39] http://www.coordinadoradelamujer.org.bo/observatorio/index.php/tematica/6/destacado/6/registro/72

Impact Statement: The objective of project "Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)" is the increased resilience of vulnerable communities, including women and girls, to the negative impacts of climate change by adapting the production systems and restoring critical ecosystem services on which they depend.

Outcome Statement: Increased resilience of 58,000 vulnerable smallholder farmers in the Valles Macro-region against reduction of water availability. Of this total, approximately 50% people are adult women. Likewise, RECEM-Valles will contribute to increasing access to safe water supply, will ensure that rural families have safe water in the face of prolonged drought, and will contribute to improving ecosystems and ecosystem services at 17,510 hectares farmland and through the promotion of soil and water conservation, agroforestry activities and appropriate watershed management measures.

Activities	Indicators and targets	Timeline	Responsibilities	Costs
Fund-level impact				
A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regionsA1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions	A1.2 Number of males and females benefiting from the adoption of diversified, climate resilient livelihood options (including fisheries, agriculture, tourism, etc.) Target: Total = 28,498 beneficiaries Male = 14,819 Female = 13,679	By end of project year 5	Gender Specialist, staff technical FAO (as Executing Entity) Human Development and Productive Development of Municipal Governments	Included in regular budget

Outcome 1: Agricultural systems transformed and reoriented to ensure food and income security in a changing climate	Indicator: Number of food secure heads of households benefitting from outcome 1 Target: Total = 23,551 Male = 12,247 Female = 11,304 From the total of 28,498 beneficiaries at least 30% are women-led households	By end of project year 5	Gender Specialist FAO (as Executing Entity) Productive Development of Municipal Governments	Included in regular budget
Output 1.1 Climate-resilient agriculture implemented and managed by smallholders for increasing the productivity and sustainability of their agroecosystems				
Activity 1.1.1 Provision of climate technologies and implementation of climate resilient agricultural practices to address vulnerability and increase resilience in the Valles Macro-region.	Indicator: Number of smallholder farmers (heads of households), who have adopted technologies and climate-resilient agricultural technologies and practices Target: Total = 4,680 Male = 2,434 Female = 2,246	Year 1Q3, Q4 Year 2 Q2, Q3, Q4 Year 3 Q2,A3,Q4 Year 4 Q4	Gender Specialist, FAO (as Executing Entity), Field Technicians Productive Development of Municipal Governments	Included in regular budget
Activity 1.1.2 Capacity building on climate resilient agricultural practices to contribute to increased resilience and productivity of agricultural systems	Indicator: % of total number of productive associations that have been trained in use of climate resilient technologies, agroecological production, conservation agriculture and/or agroforestry are led by women. Target: 30%	Year 1 Q4 Year 2 Q4	FAO (as Executing Entity), Field Technicians Gender Specialist	Included in regular budget
Output 1.2 Increased market access of climate resilient agricultural products				

Activity 1.2.1 Development and implementation of community and associative productive enterprises	Indicator: % of total number productive associations trained in economic empowerment and decision making on the use of their income are led by women Target: 30% Indicator: % of total number of associations who have received technical assistance for the process of organic certification of agricultural products are led by women. Target: 30%	Year 1 Q4 Year 2 Q4 Year 3 Q4 Year 4 Q4	Gender specialist, FAO (as Executing Entity) personal technician Human Development and Productive Development of Municipal Governments	Included in regular budget Specific budget for women's empowerment workshops
Activity 1.2.2 Technical support and implementation of collection and marketing centres for organic and / or agroecological products	Indicator: % of total number of communities and associative productive enterprises, that receive training in the collection, processing and marketing of agroecological products have a majority of female membership. Target: 30% Indicator: Number of agroecological products produced by women, that receive technical support for the collection, processing and marketing of this product.	Year 2 Q2, Q3 Year 3 Q1, Q2, Q3 Year 4 Q1	FAO (as Executing Entity) FAO (as Executing Entity)	Included in regular budget

	Target: 5 Indicator: % of productive associations led by women participate in at least one national fairs to promote and market their products. Target: 30%			
Activity 1.2.3 Promoting climate resilient value chains for livelihood diversification according to the prioritized region	Indicator: % of women´s participation in productive associations that will receive technical support on beekeeping. Target: 30% Indicator: % of total participants of the training on leadership, self-esteem and gender roles, as well as the value chain with a gender approach[40] are women. Target: 30% Indicator: % of participants of the training on alternative masculinities[41] who are men. Target: 50%	Year 1 Q3 Year 2 Q3 Year 3 Q3	FAO (as Executing Entity) FAO (as Executing Entity) Gender Specialist specialist in masculinities	Included in regular budget Specific budget to hire a gender specialist and a specialist in masculinities
Output 2.1. Enhanced and modernized on-farm climate-proofed irrigation systems				

[40] Training topics will be further detailed during implementation through stakeholder consultations, but will also highlight: communication actions that publicize legislation that promotes gender equality and promotes decision-making

[41] Training topics to be further detailed during implementation, through stakeholder consultation, but will also highlight: communication actions to prevent all forms of violence and discrimination against women who are in the process of empowerment and seeks to promote co-responsibility in caregiving

Activity 2.1.1 Improve and expand the water reservoirs network to optimize water-harvesting activities linked to on-farm climate-proofed irrigation systems	Indicator: % of total beneficiaries (female heads of household) with access to water for irrigation due to the improved water reservoirs and rain water harvesting systems. Target: 30% Indicator: Reduction of time in % spent daily by women-led households irrigating their land through the use of optimized water-harvesting activities linked to on-farm climate-proofed irrigation systems. Target: 20%	Year 1 Q4 Year 2 Q3, Q4 Year 3 Q1, Q3	FAO (as Executing Entity) Field technicians Productive Development of Municipal Governments	Included in regular budget
Activity 2.1.3 Implement, revitalize and technify on-farm climate-proofed irrigation systems (GCF	Indicator: % of reduced daily time spent by women-led households on irrigating their fields through the use of improved on-farm irrigation systems (including water reservoirs and rain water harvesting). Target: 20%	Year 1 Q4 Year 2 Q3, Q4 Year 3 Q1, Q3	FAO (as Executing Entity) Field technicians Productive Development of Municipal Governments	Included in regular budget
Output 2.2 Strengthen capacities for the management of on-farm climate-proofed irrigation				

Activity 2.2.1 Strengthen capacities of irrigation associations, farmers and community promoters[42], to enable locally-owned technological innovation processes related to on-farm climate-proofed irrigation systems.	Indicator: % of community promoters that have been trained for the implementation of climate-proofed irrigation systems are women. Target: 30%	Year 1 Q4 Year 2 Q4	FAO (as Executing Entity) Field technicians Productive Development of Municipal Governments	Included in regular budget
Output 3.1. Restored and conserved ecosystem management for enhanced climate resilient watersheds				
Activity 3.1.1 Development and implementation of integral micro-watershed management and water use plans to enhance climate change adaptation. This activity will allow local producers to make responsible water use from source to consumption. This will benefit the strengthening of diversified agricultural production systems and thus will support the resilience of agroecosystems. For the implementation of the water use plans, affected rural land owners, both men and women, will receive technical assistance regarding water use in productive systems.	Indicator: % of total number of farmers who have received technical assistance for improved water use in their agricultural production are women-ked households Target: 30%	Year 2 Q2 y Q4	FAO (as Executing Entity) Field technicians	Included in regular budget
Activity 3.1.2: Implement restoration processes in micro-watersheds, to increase resilience and climate adaptation by enhancing ecosystem functions and services. Perform restoration practices for the conservation and restoration of watersheds and their environmental functions. Restoration measures as an intervention to recover water sources and degraded soils. The intervention will consist of the restoration with native species, according to each selected site's ecological and environmental characteristics.	Indicator: % of total number of farmers who implement agroecological and conservation practices on their farms are led by women Target: 30%	Year 2 Q 4	FAO (as Executing Entity) Field technicians	Included in regular budget

[42] A community promoter is someone who can either be a leader of an association, or leader of any other group within the community. Someone who can in turn train and engage with other community members.

Output 3.2 Information and long-term monitoring system for water sources at place				
Activity 3.2.1: Develop and implement an online tool for monitoring, consolidation and dissemination of information relevant for informed climate-sensitive planning and decision-making processes related to sustainable water use (based of climate, weather conditions, foot print of food production, water availability	indicator: Number of farmers who have been trained to use the monitoring tool to make informed decision on the use of water resources for agriculture and other uses. Target: Total: 20,000 Men: 10,400 Women: 9,600	Year 2 Q1	FAO (as Executing Entity) Field technicians	Included in regular budget
Output 4.1 Strengthening capacities for national and sub-national government entities to implement policies and norms for the climate-resilient food production under under irrigation systems, integral watershed management and monitoring of ecosystem functions and services.				
Activity 4.1.1 Implement national and sub-national policies and plans (including PTDIs) that contribute to climate change adaptation and mitigation processes, contributing to the JAMA and to the Bolivia´s NDCs	Indicator: Number of women who are involved in the decision making process for the implementation of the PTDIs (territorial planning instruments) at the municipality level Target: At least 5 per municipality. At least one defined as youth (under the age of 32 years). At least 20 municipalities out of 65 have reached this target	Year 1 Q4	Gender Specialist (FAO as Executing Entity), personal technician Offices of Human Development and Productive Development of Municipal Governments	Included in regular budget
Output 4.2 Improved financial mechanisms that support climate-resilient agricultural production and irrigation systems designed to mobilize increased finance for farmers				
Activity 4.2.1: Partner with existing domestic funders and financial institutions to develop innovative financial	Indicator: Number of financial mechanism designed and implemented for production and	Year 3 Q4 Year 4 Q4	Gender Specialist (FAO as Executing Entity), technical	Included in regular budget

instruments that enable the implementation of climate-proofed irrigation and ecosystems restoration investments.	irrigation loans targeting women and young producers Target: 1		staff of the financial mechanisms	
Activity 4.2.2 Strengthen the capacities of communities, smallholders and associations on financial management and access to innovative financial instruments relevant for climate resilient agriculture.	Indicator: % of total number of beneficiaries trained in financial literacy, including access to financial instruments are women-led households Target: 30%	Year 1 Q4 Year 2 Q1, Q4 Year 3 Q1, Q4 Year 4 Q1 Year 5 Q1	Gender Specialist (FAO as Executing Entity) Technical staff of financial mechanisms	Included in regular budget
Output 4.3 Strengthening local governance in participatory climate adaptation, early warning systems				
Activity 4.3.1 Capacity strengthening for local stakeholders (including smallholders, public officers, local CSOs and relevant academia) on the integration of climate change risks for decision making to increase the resilience of smallholders and communities Strengthen institutional capacities to govern the Early Warning System for Agricultural Risks' implementation process to provide timely information to local producers and decision-makers though the Coordination and Consultative Territorial Platforms as key channels of information for the smallholders and communities.	Indicator: % of total number of stakeholders who have received training in Early Warning Systems for Agricultural Risks are women-led households Target: 30%	Year 2 Q1	FAO (as Executing Entity) technical staff and climate change specialists Productive Development of Municipal Governments	Included in regular budget

11. APPLICABLE SOCIAL SAFEGUARDS POLICIES

This proposal has been prepared following the policies social safeguards standard of GCF and FAO.[43] [i]These standards are described below.

FAO has a set of environmental and social environmental and social risk management safeguards in its strategies, policies and projects on the ground. These guidelines aid in identifying and early and systematically assessing environmental and social risks and their integration into the project cycle (design and implementation). FAO's social and environmental standards are applicable in 9 areas[44]

However, the Gender Plan will consider those that are more closely linked to gender equality.

A.1 FAO social Safeguards considered are:

ESS 7: Decent work
ESS 8: Gender equality
ESS 9: Indigenous peoples and cultural heritage

A.2 FAO Policies considered are:

- **FAO whistleblower protection policy** (administrative circular N°2019/06) applying to any FAO personnel when internal or external reporting according to the consideration of the circular.
- **GCF Policy on the Protection of Whistleblowers and Witnesses (2018)** aims to empower GCF-project related persons to report suspicions of wrongdoing in good faith and without fear of retaliation so that the GCF can effectively protect its interests, resources, and mission.
- **FAO Policy on Gender Equality 2020-2030** strives to achieve equality between women and men in sustainable agriculture and rural development for the elimination of hunger and poverty.
- **GCF Gender Policy (2019)** reinforces the responsiveness of GCF to the culturally diverse context of gender equality to better address and account for the links between gender equality and climate change.
- **FAO Protection from sexual exploitation and sexual abuse** (PSAE) N° 2013/27. The principles of integrity, professionalism, respect for human rights and the dignity of all peoples underpin FAO's commitment to preventing and addressing acts of sexual exploitation and abuse (SEA)
- **FAO Policy on the prevention of harassment, sexual harassment and abuse of authority** N° 2015/03 (2015) and FAO policy on sexual harassment (13 February 2019) which states Sexual Harassment in all its forms is contrary to the United Nations Charter, the Staff Regulations and Staff Rules of the Organization and the Standards of Conduct for the International Civil Service.

A.3 GCF Safeguards

[43] FAO's environmental and social standards: https://www.fao.org/environmental-social-standards/standards/en/

[44] Annex 6 for the proposal to the Green Fund: Enviromental and Social Management Framework all safeguards and policies.

The GCF uses the International Finance Corporation (IFC) (part of the World Bank Group) performance standards. The list of standards are the following:

- Management – expected to be endorsed in 2022 that will have explicit reference to SEAH, accompanied by relevant operational guidance (that will be in line with GCF policy).
- Performance Standard 2: Work and working conditions
- Performance Standard 4: Community health and safety
- Performance Standard 7: Indigenous peoples

A.4 GCF policies considered are:

- **GCF Revised Policy on the Prevention and Protection from Sexual Exploitation, Sexual Abuse, and Sexual Harassment (2021)** sets clear obligations for GCF-project related persons to prevent and respond to SEAH and to refrain from condoning, encouraging, participating in, or engaging in SEAH.
- **GCF Gender policy (2019),** mainstream gender issues in its implementation arrangements and frameworks for its projects. The Gender Policy recognizes that gender relations, roles and responsibilities exercise important influences on women's and men's access to and control over decisions, assets and resources, information, and knowledge.

11.1.1 Consistency of FAO and GCF safeguards standards

Table 13, below, shows the relationship between the 3 FAO standards or norms and the IFC performance standards. Basically, these two sets of standards complement each other and in many cases the guidelines are the same; in this regard, the FAO standards were used to guide the project social assessment.

Table 6: Comparison of FAO and GCF social safeguards standards

FAO Standards	GCF Performance Standards
ESS 7: Decent work	PS 2: Work and working conditions
ESS 8: Gender equality	PS 1: Environmental and social impact assessment and management (partially)
ESS 9: Indigenous peoples and cultural heritage	PS 7: Indigenous peoples

11.1.2 FAO safeguards framework

FAO's Social Standards (ESS) 7-9 are designed to help manage and improve FAO social performance through a risk- and outcome-based approach. The three ESS set out specific requirements relating to different social issues in the projects

Table 6: Overview of FAO social and safeguards standards

FAO Standards	Objectives
ESS 7: Decent work	• Promote direct action to foster decent rural employment.

	• Promote fair treatment, non-discrimination and equal opportunity for all workers. • Protect and support workers, particularly disadvantaged and vulnerable categories of workers. • Promote the application of international labour standards in the rural economy, including the prevention and elimination of child labour in agriculture.
ESS 8: Gender equality	•Provide equal access to and control over productive resources, services and markets. • Strengthen women and men's participation in decision-making in rural institutions and policy processes. • Ensure that all stakeholders benefit equally from development interventions and that inequality is not reinforced or perpetuated.
ESS 9: Indigenous peoples and cultural heritage	• Ensure that the UN Declaration on the Rights of Indigenous Peoples is respected in all FAO's projects and programmes. • Promote the right to self-determination and development with identity of indigenous peoples (right to decide the kind of development that takes place among their people and on their lands and territories, in accordance with their own priorities and conceptions of well-being). • Guarantee the application of the principle of Free, Prior and Informed Consent (FPIC) of indigenous peoples affected by the project. • Recognize, respect and preserve the rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems of Indigenous Peoples. • Protect cultural heritage and avoid its alteration, damage or removal.

12. RISK CLASSIFICATION

The assessment classified project risk as moderate, although large-scale, significant, or irreversible environmental impacts are not expected. The potential impacts identified are mainly impacts associated with activities that include community participation, especially of indigenous communities, on a purely voluntary basis, which can be mitigated effectively and are addressed through the project's selection criteria and social and environmental plan of action.

12.1 Summary of the Project's Sociocultural Impacts

The following is the Social Impact Assessment of the project following the guidelines for FAO field projects.

Table 7: Project social impact assessment checklist

Would the project, if implemented	Not applicable	Yes	No	Unable to determine	Technical justification/description
ESS 7 DECENT WORK					
Adhere to FAO's guidance on decent rural employment, promoting more and better employment opportunities and working conditions in rural areas and avoiding practices that could increase workers' vulnerability?		x			Because the project focuses on family age, it will promote significant improvements in the employment opportunities and working conditions in the Valles Macroregion, supporting highly vulnerable supporting women smallholders to access markets and diversify their livelihoods.

Respect the fundamental principles and rights at work and support the effective implementation of other international labour standards, in particular those that are relevant to the agro-food sector?		x			The project will promote the fundamental principles and workers rights, including those workers directly recruited under the project. The recruitment of workers directly under the project will be conducted according to the UN/FAO regulations. with equal opportunity criteria for men and women
ESS 8 GENDER EQUALITY					
Have the needs, priorities and constraints of both women and men been taken into consideration?		x			During the consultation, the constraints, needs and priorities of men and women were identified. The Gender Plan proposes response actions, considering the participation of at least 30% of women in the project.
Promote women's and men's equitable access to and control over productive resources and services?		x			Women will participate equally in all project activities and will receive information, technical assistance, training, inputs and equipment. The women will be consulted to establish schedules, days, places, etc.
Foster their equal participation in institutions and decision-making processes?		x			Specific actions and indicators for the empowerment of women have been foreseen in the project for each component (logical framework).
ESS 9 INDIGENOUS PEOPLES AND CULTURAL HERITAGE					
Are there any indigenous communities in the project area?		x			The Valles Macroregion of Bolivia is home to a wide cultural diversity. Indigenous communities occupy 4,307,145 ha in indigenous communitarian lands and farming communities occupy around 1,104,911 ha (Project Components 1, 2, 3 and 4).
Are project activities likely to have adverse effects on indigenous peoples' rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and culture or heritage (tangible and intangible)?			x		No, because the project acts under the principle of free, prior and informed consent and the actions will respond to the needs identified in the consultation.
Are indigenous communities outside the project area likely to be affected by the project?	x				Not applicable
Designed to be sensitive to cultural heritage issues?	x				Not applicable

12.2 Analysis of the Gender on the potential risks and measures mitigation of the project

As mentioned previously, the project is classed as Moderate Risk. Here follows a summary of the main risks and the measures mitigation:

Below is a list of risks that the project may face when promoting gender equality, and that may frustrate the Gender Action Plan objective. Measures that may be taken to deflect these risks while the project is being implemented are also proposed along with the Institution responsible for mitigating the risks.

Table 8: Risk when promoting Gender Equality

Description of the risk	Impact • High • Medium • Low	Likelihood of risk occurring	Mitigation actions	Institution responsible
The project does not hire a specialist who will ensure compliance with the Gender Action Plan	H	M	-- Must hire a gender specialist who monitors the project implementation	• MMAyA • FAO implementing agency
There is no specialist in masculinities who works to raise awareness among men.	M	M	-A specialist in masculinities should be part of the baseline and specific actions should be taken to raise awareness among men.	• FAO implementing agency
Women's care work is not recognized and they cannot participate in the project's actions.	H	H	-Consider days, times and places of easy access for women. -Consider mobile day care centers so that women can attend with their young children. - communication actions to raise awareness and provide information on women's rights.	• FAO • Gender specialist • Communication Specialist
Perpetuate traditional gender roles in the project. Women should stay at home and do the housework)	M	H	--Disseminate laws and rights - Raise different actors' awareness of gender and masculinities -Identify alliances with the Guaraní Captaincies - Communication products to support gender equality	• Municipal govts. • FAO implementing agency • Communications specialist • Gender specialist • Communications specialist
Do not give priority to female heads of households in the project actions	M	M	-Train project technical staff in gender and masculinities. -Aim to have a 50:50 split of men and women hired as technical staff for the project. -Ensure that the team to be hired is trained or has experience working with a gender focus. - Guarantee at least 30% women and 10% young people in all project actions.	• FAO implementing agency • Gender specialist • Project technical team • Project coordinator
Lack of access to information due to digital gap that affects women, lack of access to Smart phones, and lack of access to internet signal in communities	M	H	-Identify women promoters in the communities who can replicate the knowledge they learn during the project training and from the technical assistance -Support with communication materials, using conventional media (radios)	• Municipal govts. • FAO implementing agency • Communications specialist • Gender specialist • Women promoters in the communities
Women do not have the time to participate in the project (child care,	M	H	-Support material raising awareness of how to share roles within the family	• Municipal Govts.' Human

housework, work in the field)			-Consider affirmative action when selecting and supporting women producers organizations, providing training and technical assistance, equipment and technology that relieves women's work burden -Support with temporary nurseries - Technical staff must go to the communities -Consult with the women where, what days and times are convenient for technical assistance and training	Development Offices • FAO implementing agency • Communications specialist • Gender specialist • Women Producers Assoc.
Women do not participate in the project: shy, unsure of themselves and don't feel capable of making decisions	M	H	-Disseminate the Gender Assessment, which includes recognition of women's capacities, knowledge and resources. -Actions to empower women: training in self-esteem, leadership, gender. -Alliances with state institutions (Plurinational Service for Women and Dismantling Patriarchy) and local authorities to promote equal participation for men and women -When inviting people to participate, use the same media used by the women, go through their organizations and leaders in the municipality and community, and the radio stations they listen to. -Say explicitly in the invitation to participate in the project that women and men are invited	• SEPMUD • Municipal govts. • FAO implementing agency • Communications specialist • Gender specialist • Local Authorities
Sexism (not having the freedom to decide or go to a project activity (technical assistance, training, share experiences) Women's low self-esteem, fear of violence, shyness.	H	H	-Evaluate whether to do separate events for men and women -When introducing the project aims, explain that it is important that women and men participate -Hire female project staff - Organize events in the communities, not in places where people have to travel to/stay -Work with female community leaders -Workshops on self-esteem and gender equality for women -Workshops on masculinities for men	• Municipal Govt. • FAO implementing agency • Gender specialist • Project technical team • Project coordinator
Poverty (difficulty paying associated costs of attending training and other project events)	H	H	-Organize events in the communities, not in places where people have to travel to/stay (reduce costs) -Include a budget to cover travel and food costs, etc. in the budget for workshops	• FAO implementing agency • Gender specialist • Project technical team • Project coordinator
Illiteracy, low education level, monolingual (native language)	H	H	- Use colloquial language, with examples -Use visual material -Use participatory methods	• FAO implementing agency • Gender specialist • Project technical team

Complex topics covered in training and technical assistance	M	H	-Use simple teaching methods (simple language, posters, etc.) -Use the "learn by doing" method -Share experiences	• Implementing agency • Communications specialist • Gender specialist • Local Authorities
Women's organizations are not recognised	H	H	-Use community radio stations to broadcast information about the project, laws and women's empowerment -Information disaggregated by sex to guide awareness-raising -Alliances with Women's organizations -Alliances with female councillors -Gender training for government bodies	• MMAyA, FAO • Municipal Govts.' Human Development Offices • Women's Assoc.
Women with small children cannot participate fully in the meetings and training workshops	M	M	-Define places, times and times that are convenient for the women to be able to attend the training -Agree with the women the times, days and places for the training, seeing how to organize temporary nurseries so that the women with small children can concentrate (only if the women agree to this option)[45]	• Municipal Govts.' Human Development Offices • Implementing agency • Gender specialist • Young women from the communities
Quanti-qualitative indicators are not included in the M&E system	H	M	-Coordinate with the MMAyA from when the project starts so that the M&E system is programmed to measure the gender indicators - Gender training for government bodies	• MMAyA • FAO implementing agency • Gender specialist • Head of M&E
No specific budget allocated to guarantee that gender is mainstreamed throughout the project	H	M	Include Gender Action Plan actions in the budget	• FAO implementing agency • Gender specialist • Project coordinator
The communication strategy during the project implementation does not mainstream the gender equality criteria	H	M	-The gender specialist should be part of the communications team to ensure that stereotyped images and sexist language are avoided, and that the values of social inclusion and gender are incorporated fully into all written and audio-visual communication material -Check that gender is mainstreamed throughout all communication products and mid-term and final reports -Document and systematize good practices and successful experiences from a gender perspective	• Gender specialist • Communications specialist • Project coordinator

[45] Because many of the women will attend meetings, workshops, etc. with small children, some of the women could be paid to look after the children, setting up a "temporary nursery" during the event. It is especially important to encourage single mothers (often young) to attend. Paying the mothers who look after the children could be factored into the cost of holding the event.

Women are not adequately represented in producers' associations and local decision-making bodies	H	H	-Awareness-raising work with producer organizations and others on gender equality and its benefits -Disseminate national laws that promote gender equality -Support these organizations to modify their regulations to establish parity in representation by men and women -Strengthen organizations of women producers	• MMAyA, FAO • Municipal governments • Tarija Women's Organization • Alliance of Women's Community Organizations for the Democratic and Cultural Revolution

12.3 Related Risks to SEAH and GVB

Project activities can bring minor influx of labor and employment income differentials in local communities. Projects with minor labor influx of workers may increase the demand for sex work, including the risk for trafficking of women for the purposes of sex work; or the risk of forced early marriage. Furthermore, higher wages for workers in a community can lead to an increase in transactional sex. The risk of incidents of sex between laborers and minors, even when it is not transactional, can also increase.

Risk of SEA/SH by project personnel e.g. regional and provincial level officials who may ask for sexual favors from women and girls for them to be selected as project beneficiaries. The proposed project envisages increase in agricultural activities on and off the farm, improve productivity of critical food crops and create short term employment opportunities in the project target areas, and hence enhanced mobility of both women and men. Higher mobility exposes women to more risks of GBV, including rape.

Women are responsible for household chores, which require much time and energy. They will be adding another task to their already full plate by participating in the project. It cannot but result in less time spent in household chores and caregiving, which may well cause dissatisfaction of male members of the household and lead to violence against the women.

While all project related personnel are engaged on the condition that they follow various Codes of Conduct, including those on sexual exploitation and abuse, we cannot rule out the possibility that female beneficiaries may be asked for sex or related favors in exchange for participation in the project or for obtaining agricultural inputs.

Women may face opposition of their husbands and other male family members for their wish to participate in the project. In some households, the situation may escalate to violence. If their spouses are not involved in the project, the possibility of violence is higher. Women beneficiaries may be harassed or attacked also by men outside their households, who are not involved in the project and take out their frustration on the women.

If women's income increases, that fact may make men to feel insecure and turn violent against the women. If women refuse to give up their earnings to their husbands and other male family members, that is likely to trigger violence against the women.

Considering that many are heads of households, there is strong incentive for children to be involved in such activities. FAO experiences show that almost no agricultural intervention is neutral in terms of child labor. The children are affected by the changes in adults' responsibilities

in the field and also by the changes in the adults' ability to carry out household chores, which are caused by the changes in the field.

FAO has mandatory courses for staff working on projects: Policy on the Prevention of Harassment, Sexual Harassment, and Abuse of Authority Working Harmoniously, in addition to the CODE OF ETHICAL CONDUCT, where GBV and prevention policy is addressed.[46]

12.3.1 Gender-based violence

In order to contribute to the protection of populations at risk of, or affected by, GBV while ensuring that no individuals are exposed to harm as a result of FAO interventions, GBV concerns must be mainstreamed into FAO projects and programmes.

There are documents to provide practical guidance to FAO staff and partners on how to mainstream protection from GBV into the design and implementation of interventions.[47] The following is a list of guiding principles that aim to ensure humanitarian and development interventions are safe, nondiscriminatory, participatory, accountable and sustainable:

12.3.2 Guiding Principles for protection mainstreaming

- Understanding the local context and building on women's and men's strengths and assets: Build upon the local capacities and services and respect local cultures without perpetuating stereotypes and discrimination.
- Safety, dignity and "do no harm": Prevent and minimize as much as possible any unintended negative effects of your intervention that can increase people's vulnerability to both physical and psychosocial risks Inclusive access: Pay attention to access issues (e.g. disability, discrimination or stigma) preventing people in need from accessing aid, services and workshops. Make arrangements to facilitate access, ensuring that no one is left behind.
- Participation and empowerment: Empower men and women by ensuring programming is based upon sound analysis of the context and social dynamics. Men and women must be informed about project objectives and their participation ensured throughout the project cycle.
- Coordination and partnerships: Promote and maintain strong and respectful partnerships with other sector specialists, in particular those with protection and GBV expertise (including GBV sub clusters and other coordination bodies), for knowledge sharing and to ensure work is in line with and complements other agencies' efforts.
- Accountability to affected populations: Set up appropriate mechanisms for affected populations to participate in project design and provide feedback throughout implementation. Programmes should be reactive to feedback, concerns and complaints

It is also important to mention that FAO **has the policy against gender-based and child violence, sexual exploitation and harassment** (Appendix 4) that will be socialized with the technical staff and the direct target population of the project to prevent this type of actions and, if necessary, they can also file complaints.

The following risks have been identified with respect to SEAH and GVB:

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[46] FAO: Code of ethical conduct, Rome, 2021.

[47] FAO:_ How can we protect men, women and children from gender-based violence?, Rome, 2018

Table 9: Risk and SEAH-GBV Impact and Mitigation Measures					
Description of the risk	**Impact** • High • Medium • Low	**Likelihood of risk occurring**	**Impact potential**	**Mitigation measures**	**Institutions responsible for measures**
Violence against women and discrimination on the grounds of gender, ethnicity and age	H	H	- That women do not accept to participate in the project. -That young people do not participate in the project. - Indigenous women in the communities feel discriminated against because of poverty, illiteracy and language. - Husbands not allowing wives to participate in the project - That physical violence increases because women participate in the project.	-Disseminate law on protection and attention to violence (Law 348) - Public awareness-raising actions -Alliance with the Plurinational Service for Women and Dismantling Patriarchy (SEPMUD) -Alliances with UN agencies in the zone (UNFPA) -Alliances with Municipal Govts. To carry out actions to prevent and deal with violence - Alliances with Captaincies to strengthen community justice mechanisms and prevent violence against children, women and the family - The communication strategy will promote GBV prevention campaigns. - Workshops on masculinities with the partners of the women participating in the Project -Use of methodologies appropriate to the target population. -Didactic material with graphics and simple language.	• SEPMUD • VIO • Municipal Govts.' Human Development Offices • Integrated Legal Services • Protection Office PMU (ESS specialist. • Implementing agency • Gender Specialist • Communication Specialist • Specialist in masculinities

Gender Based Violence/Sexual Exploitation Abuse and Harassment	L	H	- Direct project workers and employees of contractors and subcontractors may be involved in sexual harassment and rape. Other forms of gender-based violence and discriminatory practices that may occur during project implementation include employers and supervisors requesting for sexual favors as a pre-requisite for employment opportunities at the workplace. - Workers may also be engaged in issuing threats, insults, assault and other forms of abuse on girls, women, children and other vulnerable groups. Acts of Gender Base Violence have long term physical health and psychological effects on survivors. - Increased violence by men against women participating in the project, because they have to leave the care work.	- SEAH-GBV action plan to be developed during project inception phase. -Annual awareness workshops shall be undertaken for employees of the Contractor/Supervising Consultant and Sub-Contractors as well as persons working or living in the immediate project area and to provide contact numbers of the nearest law enforcement Agency Office, the Grievance Redress Mechanism and GBV Service Providers to offices, schools within the project area. - Contractual Clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV will be inserted in Contract Documents. - Contractual Clauses with a commitment to cooperate with law enforcement agencies investigating cases of gender-based violence shall be inserted into the Contract documents of the contractor and Supervising Consultant. - Contractual clauses against rape, defilement and other Gender based Violence as well as child and forced Labor shall be inserted into the	• PMU (ESS specialist) • Gender Specialist) • FAO ethics office • Territorial Operations Units. • Accompanying institutions (MMAyA, FAM). • Integral municipal legal service • Indigenous authorities • Municipal Ombudsman's Office for Children and Adolescents • Communication specialist • Women councilors in the municipalities

				contract of the Contractor and Supervising Consultant. - Workers on site will sign Code of Conduct with sanctions on rape defilement, abuse and other gender-based violence. - To reinforce at the beginning of the project with all personnel the FAO Code of Ethical Conduct (mandatory course).	

13. GRIEVANCE REDRESS MECHANISMS

FAO is committed to ensuring that its programs are implemented in accordance with the Organization's environmental and social obligations. To better achieve these goals, and to ensure that beneficiaries of FAO Programs have access to effective and timely attention to their complaints about non-compliance with these obligations, the Organization, to complement measures to receive, review and act as appropriate on these complaints at the program management level, has given the Office of the Inspector-General the mandate to independently review complaints that cannot be resolved at that level. FAO will facilitate the resolution of concerns from beneficiaries of FAO Programs regarding alleged or potential violations of FAO's social and environmental commitments. For this purpose, concerns may be communicated in accordance with the admissibility criteria of the Guidelines for Compliance Reviews Following Complaints Related to the Organization's Environmental and Social Standards, which apply to all FAO programmes and projects[48]

Concerns should be addressed at the closest appropriate level, i.e. at the project management/technical level, and if necessary at the Regional Office level. If a concern or complaint cannot be resolved through consultation and action at the project management level, a complaint may be filed by requesting a Compliance Review with the Office of the Inspector General (OIG) in accordance with the Guidelines. Program and project managers will be responsible for addressing concerns brought to the attention of the point of contact. Principles to be followed during the complaint resolution process include: impartiality, respect for human rights, including those related to indigenous peoples, compliance with national standards, consistency with standards, gender equity, transparency, honesty and mutual respect.

13.1 Project-level grievance mechanism

The project will establish a grievance mechanism at field level to receive complaints; this grievance mechanism has been agreed with beneficiaries (including during the FPIC with indigenous populations) to take place in the context of the Consultative Territorial Platforms to be facilitated in the context of the project (Activity 4.3.3.). Contact information and information on the process to file a complaint will be refined once the consultative platforms are operational and will be disclosed in all meetings, workshops and other related events throughout the life of the project. In addition, it is expected that all awareness-raising material distributed will include the necessary information regarding the contacts and the process for filing grievances, including on the availability of and ways to access the GCF's Independent Redress Mechanism.

SEAH and GBV grievances will be managed as incidents with an inclusive, survivor-centered and gender responsive approach, including confidential reporting and mandatory involvement of the FAO E&S and Gender specialists in monitoring the process. In case of GBV, the reporting party will be immediately directed to appropriate GBV referral pathway by the GRM personnel, and directed as necessary to medical care, psychosocial support, legal support, community driven protection measures, and reintegration services.

[48] (Available online at: http://www.fao.org/3/a-i4439e.pdf).

The project will also be responsible for safe and ethical documenting and reporting as part of the safeguards performance monitoring on any grievances received and how they were addressed.

The mechanism includes the following stages:

a) The complainant files a complaint through one of the channels of the grievance mechanism. This will be sent to the Environmental and Social Safeguards Specialist to assess whether the complaint is eligible. The confidentiality of the complaint must be preserved during the process.
b) The Project Team (PT) will address eligible complaints and the Environmental and Social Safeguards Specialist will be responsible for recording the grievance and how it has been addressed, if a resolution was agreed.
c) If the situation is too complex, or the complainer does not accept the resolution, the complaint must be sent to a higher level, until a solution or acceptance is reached.
d) For every complaint received, a written proof will be sent within ten (10) working days; afterwards, a resolution proposal will be made within thirty (30) working days.
e) In compliance with the resolution, the person in charge of dealing with the complaint, may interact with the complainant, or may call for interviews and meetings, to better understand the reasons.
f) All complaints received, their response and resolutions, must be duly registered.

Resolution

Upon acceptance a solution by the complainer, a document with the agreement should be signed

Table 10: Grievance mechanism

Local Level	Gender Focal Point – FAO Bolivia Patricia Amatller Ticona **Email**: patricia.amatllerticona@fao.org Ethics Focal Point – FAO Bolivia Karol Rodo **Email:** Karol.rodo@fao.org Environmental and Social Safeguards Specialist – FAO Bolivia Wilson Rocha Vera Email: wilson.rochavera@fao.org
FAO Representation	Must respond within 5 working days, in consultation with Project Team. Rosse Noda **Email:** rosse.noda@fao.org
Regional FAO Office for Latin America and the Caribbean	Must respond within 5 working days in consultation with FAO's Representation. María Mercedes Proaño **Email:** mariamercedes.proano@fao.org
Office of the Inspector General (OIG)	To report possible fraud and bad behavior by fax, confidential: Pablo Fonte By e-mail: Pablo.Fonte@fao.org By confidential hotline:
GCF Independent Redress Mechanism	Independent Redress Mechanism - Green Climate Fund By email: irm@gcfund.org Office telephone: +82 32-458-6186; Fax: +82 32-458-6096;

	Cellphone: +82 10-4296-1337

14. GENDER MARKER

The gender marker is used to mainstream gender equality throughout projects, which means constantly and coherently including women and men when designing, implementing and monitoring policies, programmes and projects.[49]

(..) mainstreaming gender does not only focus on involving women in projects but also making a conscious effort to make sure that they, along with the men, can define from the outset the objectives and activities to be developed by the project, programme or policy, ensuring that the needs, wishes and aspirations of both groups are recognized by the project.

Given the above and the importance given by the project to gender, the gender marker assigned is **Gender Marker 1** which has the following characteristics:

Table 11: Gender Marker 1

	Concept Note requirements	**ProDoc requirements**
The promotion of gender equality is relevant. The gender dimension is systematically integrated in the project, but the promotion of gender equality is not the main objective of the intervention	Brief explanation of how the project plans to address the problems and constraints affecting women and their specific needs	The project is designed on the basis of a gender analysis and describes roles, opportunities and constraints (supported by sex-disaggregated data) The logical framework includes activities related to gender, and gender is taken into account in outputs and indicators A sufficient budget is allocated to meet implementation needs Gender-related tasks and responsibilities are included in the terms of reference for key project staff

Gender responsiveness is seen when the project wishes to contribute to a lasting development objective by providing a solution to the needs and interests of the women and men in the target group through targeted activities, i.e. when minimal response is afforded to these interests (gender-responsive).

Considering the **Gender Integration Continuum of the Green Fund Gender Policy** (Page 12), the gender marker in the Project is Gender Responsive:

"Addresses differentiated gender needs equitable participation and equitable distribution of benefits, resources, rights and status, but does not address root causes of inequities".

[49] FAO: Gender Markers, 2020.

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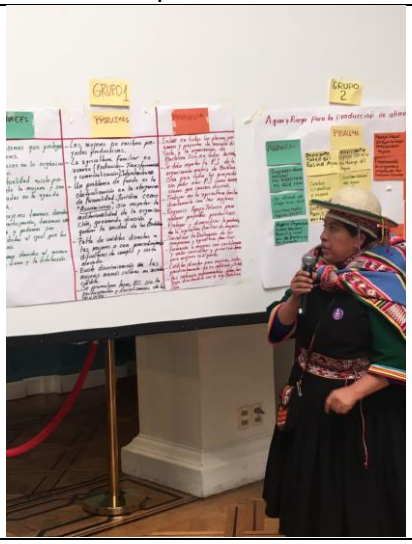
16. ANNEX

16.1 ANNEX N° 1: MUNICIPALITIES IN THE PROJECT AREA

Table 12 Municipalities in the Project area

Departamento	Municipio	Departamento	Municipio
Chuquisaca	Alcalá	Cochabamba	Aiquile
	Azurduy		Anzaldo
	Camargo		Arque
	El Villar		Arani
	Padilla		Capinota
	Poroma		Cochabamba
	San Lucas		Mizque
	Sopachuy		Omereque
	Sucre		Pocona
	Tarvita		Pojo
	Tomina		Punata
	Villa Serrano		Sacaba
	Yamparáez		Sacabamba
	Yotala		San Benito
	Zudañez		Sicaya
Potosí	Caiza "D"		Sipe Sipe
	Cotagaita		Tacopaya
	Ocurí		Tapacarí
	Potosí		Tarata
	Puna		Toco
	Ravelo		Tolata
	Tacobamba		Totora
	Tinguipaya		Vacas
	Tupiza		Vila Vila
	Vitichi		Villa Gualberto Villarroel
	Yocalla		Villa Rivero
Santa Cruz	Comarapa		Vinto
	Mairana	Tarija	El Puente
	Pampa Grande		San Lorenzo
	Quirusillas		Tarija
	Saipina		Uriondo
	Samaipata		Yunchara
	Vallegrande		

16.2 ANNEX N° 2 PHOTOGRAPHIC RECORD OF GROUP INTERVIEWS

	
Taller en el Municipio de Camargo, Departamento Chuquisaca	Taller Nacional con la Confederacion de Mujeres Campesinas Bartolina Sisa
	
Taller en el Municipio de Vitichi, Departamento Potosi	Taller de consulta con la Confederacion de Mujeres Bartolina Sisa, a nivel nacional
	
Taller con Mujeres de Tomina, Padilla y Sopachuy, Departamento Chuquisaca	Taller con Gobierno Municipal de Potosi

	
Taller Nacional con la Representantes de la Confederacion Campesina de Mujeres Bartolina Sisa	Taller con autoridades del Gobierno Municipal y la Federacion de Campesinos del Municipio de Cercado, Tarija
	
Taller con autoridades de Organizaciones Sociales a nivel nacional	Taller con representantes campesinos del Municipio de Camargo, Departamento Chuquisaca
	
Taller en Samaipata, Departamento Santa Cruz	Taller con autoridades del Gobierno Nacional

	
Taller en Municipio de Samaipata, Departamento Santa Cruz	Taller en el Municipio de Culpina, Departamento de Chuquisaca

ANNEX N° 3 WOMAN PARTICIPANTS

The Social Organizations and Public Institutions representative of the intervention area were included in the preparation of the Project. The following is the list of women who were part of the initial consultation.

Table 13 SOCIAL ORGANIZATIONS AND PUBLIC INSTITUTIONS

Departament	Organisation	Name	Position/Activity	Contact
National	Confederacion de Mujeres campesinas indigenas originarias "Bartolina Sisa"	Segundina Flores	Secretaria Ejecutiva Nacional	76738700 – 65700755
Chuquisaca	Federación de Campesinos de Tomina -	Bartola Quispe	Ejecutiva en Tomina	+591 73400326
	Productores Camargo (Tabla Cruz)	Luisa Serrano	Fruticultora	73410605
	Central Campesina Camargo	Gloria Sanchez	Secr. Hacienda	72993995
	Federacion campesina Bartolina Sisa Camargo	Adela Ramos	Ejecutiva en Camargo	73798451
	Federacion campesina Bartolina Sisa Camargo	Esperanza Rojas	Representante de jovenes	73132010
	Federacion Bartolina Sisa Camargo	Virgilia Ramos	Ejecutiva Nor y Sur Cinti	68409315
Tarija	Confederacion Bartolina Sisa Tarija	Catalina Gareca	Ejecutiva Valles	73499246

PUBLIC INSTITUTIONS

Department	Institution	Name	Position/Activity	Contact
La Paz	Ministerio de Medio Ambiente y Agua/VHR	Ivana Bellido	Directora Nacional de Cuencas	67902778
	Banco de Desarrollo Productivo	Carmen Velasco	Analista de Gestión Productiva	carmen.velasco@bdp.com.bo
	Banco de Desarrollo Productivo	Roxana Olivares	Analista de Innovación Agropecuaria	roxana.olivares@bdp.com.bo
	LIDEMA	Andrea Salinas	Coordinadora Ejecutiva	lidemabolivia@gmail.com
Chuquisaca	Asociacion Sucrense de Ecologia	Teresa Borda	Personal Tecnico	mateba07@gmail.com
	Gobierno Municipal del Municipio de Tomina	Simona Torrez	Concejal	67609890
	ONG LIDER	Martha Leyton	Directora	77123889
Tarija	Gobierno Municipal de San Lorenzo	Isabel Varca	Encargada de gestión del riesgo	69304127
	Gobierno Municipal de San Lorenzo	Adriana Avila	Tecnica del Municipio	70227023
	Gobierno Municipal de Cercado	Mariana Artega	Tecnica del Concejo	mari99550.mag@gmail.com
	Gobierno Municipal de Cercado	Raquel Ruiz	Tecnica del Concejo	raquelruiz4@gmail.com

	Gobierno Municipal de Cercado	Ilsen Copa	Tecnica del Municipio	79267496
	Gobierno Municipal de Yunchara	Noemi Flores	Tecnica del Municipio	72969974
	Mancomunidad Héroes de la Independencia	Edina Ruiz	Gerente	heroestja@gmail.com
	ONG NATIVA	Maritza Donaire	Tecnica	maritzad1@hotmail.com
	ONG PROMETA	Cecilia Cortez	Tecnica	ccortez@prometa.org.bo
	Gobierno Municipal de Uriondo	Lourdes Shigler	Representante GAM-Uriondo	
	Gobierno Municipal de Yunchara	Noemi Flores	Tecnica del Municipio	72969974
	Mancomunidad Héroes de la Independencia	Edina Ruiz	Gerente	heroestja@gmail.com
	ONG NATIVA	Maritza Donaire	Tecnica	maritzad1@hotmail.com
Potosí	Gobierno Municipal de Vitichi	Zulma Francisca Bejarano	Atención a la primera infancia	68662646

ANNEX 4 GENDER-BASED AND CHILD VIOLENCE, SEXUAL EXPLOITATION AND HARASSMENT AGAINST WOMEN AND CHILDREN: DEFINITIONS

This appendix gives the definitions of terms related to violence, exploitation and harassment and considered under this ESMF.

Harassment

The "Policy on the Prevention of Harassment, Sexual Harassment and Abuse of Authority," Food and Agriculture Organization of the United Nations (FAO) Administrative Circular, No. 2015/13, defines harassment as:

Any improper and unwelcome conduct by an individual or group of individuals that is directed at, and offensive to, another person and that the individual(s) knew, or reasonably ought to have known, would cause offence or harm to that person. Harassment does not have to be intentional or deliberate. Harassment may take the form of words, gestures or actions which tend to annoy, alarm, abuse, demean, intimidate, belittle, humiliate or embarrass another or which create an intimidating, hostile or offensive work environment.
It further characterizes harassment as normally repeated incidents. It sees harassment to include sexual harassment and abuse of authority, which are specific forms of harassment. FAO defines sexual harassment as:

Any unwelcome sexual advance, request for sexual favor, verbal or physical conduct or gesture of a sexual nature, or any other behavior of a sexual nature that might reasonably be expected or be perceived to cause offence or humiliation to another, when such conduct interferes with work, is made a condition of employment or creates an intimidating, hostile or offensive work environment. While typically involving a pattern of behavior, it can take the form of a single incident. Sexual harassment may occur between persons of the opposite or same sex.

Abuse of authority, in the context of harassment, is:

Improper use of a position of influence, power or authority against another person. This is particularly serious when a person uses his or her influence, power or authority to improperly influence the career or employment conditions of another, including, but not limited to, appointment, assignment, contract renewal, performance evaluation or promotion. Abuse of authority may also include conduct that creates a hostile or offensive work environment which includes, but is not limited to, the use of intimidation, threats, blackmail or coercion. Discrimination and harassment, including sexual harassment, are particularly serious when accompanied by abuse of authority.
It notes that sexual harassment may occur between persons of the opposite sexes or of the same sex and that unwelcome sexual behavior may be obvious, or it may be subtle and persistent. While typically involving a pattern of behavior, it can take the form of a single incident.

Violence

Violence against women, as defined by the 1993 UN Declaration on the Elimination of Violence against Women, is any act of gender-based violence that results in, or is likely to result in, physical, sexual or mental harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life.

FAO definition of gender-based violence (GBV) proposed by the Inter-Agency Standing Committee and based on the Declaration: an umbrella term covering a wide range of abusive,

exploitative and often sexualized actions that are perpetrated against a person's will and are based on socially ascribed gender differences between women and men. The definition contains characterization of GBV as "a widespread and life-threatening health, protection and human rights issue with serious negative consequences not only for survivors but also for the achievement of food security and the social and economic development of communities and states." The majority of victims and survivors are women and girls, who suffer a range of mental and physical health problems as well as stigma and discrimination, affecting their ability to fulfill their potential and undermining efforts to reduce poverty and promote peace, security and sustainable development.

FAO sees the following six types of GBV as relevant to its work:

1. Denial of resources, opportunities or services: Denial of rightful access to or control over productive and financial resources, livelihood opportunities, information, education, health or other social services. Examples include preventing a widow from receiving an inheritance, land grabbing, earnings forcibly taken by an intimate partner or family member, and preventing a partner from achieving self-sufficiency and gaining financial independence.

2. Physical violence: An act of physical violence that is not sexual in nature. Examples include hitting, slapping, choking, cutting, shoving, burning, shooting or use of any weapons, acid attacks or any other act that results in pain, discomfort or injury.

3. Sexual violence: Sexual violence takes many forms, including rape and marital rape, sexual slavery and/or trafficking, forced pregnancy, sexual harassment, sexual exploitation and/or abuse (e.g. forced prostitution), sexual slavery and transactional sex (i.e., sex for food/fish).

4. Emotional and psychological assault: Includes verbal abuse and humiliation, cruel and degrading treatment, compelling a person to engage in humiliating acts and placing restrictions on freedom of movement or behavior, thus causing increased dependency and fear.

5. Harmful practices: These include forced marriage, child marriage, honor or dowry killings, son preference (which may mean a female child is disadvantaged from birth in quality and quantity of parental care).

6. Sexual exploitation and abuse (SEA): Refers to acts of sexual exploitation and sexual abuse committed by United Nations, NGO, and Intergovernmental Organization (IGO) personnel against the affected population.

ANNEX 5: STATISTICAL INFORMATION ON THE PROJECT AREA

Access to water resources in municipalities in the project area

Table 14. Statistics on access to water by gender in Chuquisaca

Codigo UHG*	Departamento	Provincia	Municipio	Porcentaje de mujeres por Provincia	Población de mujeres	POBLACIÓN TOTAL (Objeto de estudio)	Población No Pobre	Porcentaje de Población Pobre	Procedencia del agua que utilizan en la vivienda (PORCENTAJE)						ACCESO AL AGUA CON GÉNERO				
									Cañeria de red	Pileta pública	Carro repartidor (aguatero)	Pozo o noria	Lluvia, río, vertiente , acequia	Otro (lago, laguna,curichi)	POBLACION DE MUJERES CON ACCESO A 100% DE FUENTES DE AGUA (PRIMER GRUPO)	POBLACION DE MUJERES SIN ACCESO A 100% DE FUENTES DE AGUA (SEGUNDO GRUPO)	NUMERO DE FUENTES DE AGUA DEL PRIMER GRUPO	NUMERO DE FUENTES DE AGUA DEL SEGUNDO GRUPO	PORCENTAJE DE FUENTES DE AGUA DEL SEGUNDO GRUPO
868665; 866639; 866638; 866637; 866644; 866689; 866682; 868683; 868696; 866628;	Potosí	José María Linares	Puna	52	11.044,8	21.240	26,9	73,1	23	7	9	10	1	50	2971	8074	14180	9949	70
868835; 868838	Potosí	José María Linares	Caiza "D"	50	5.739,0	11.478	32,9	67	74	6	0	2	17	1	1888	3845	4325	854	20
866699; 866698; 866945; 866943; 866942; 866941; 868886; 868699; 866918	Potosí	Tomás Frías	Potosí	52	96.962,8	186.467	74,7	25,3	46	13	0	17	20	2	72431	24532	7103	2872	40
866944; 866949; 866947; 866948; 866955; 866951	Potosí	Tomás Frías	Yocalla	48	4.189,0	8.727	34,9	65,1	33	8	0	2	55	2	1462	2727	4729	2793	59
866928; 866921; 866925; 866929; 866922; 866926	Potosí	Tomás Frías	Tinguipaya	47	12.575,3	26.756	4,5	95,5	59	28	0	4	7	1	566	12009	2061	264	13
866861; 866869; 46697369; 4669938; 866859; 866849; 866846; 46697896	Potosí	Chayanta	Ravelo	49	9.932,3	20.270	8,4	91,600	59	12	11	12	5	1	834	9098	47536	13538	28
4669949	Potosí	Chayanta	Ocurí	47	7.341,9	15.621	7,2	92,7	62	13	0	3	17	5	529	6806	1434	357	25
86862; 868671; 868675; 868677; 868679; 868618; 86865; 868667; 868662; 868663; 868661	Potosí	Nor Chichas	Vitichi	53	5.492,9	10.364	18,9	81,1	41	4	0	14	38	2	1038	4455	2950	1605	54
86843; 86839; 868831; 868913; 868417; 868449; 868445; 868443; 868455; 868461; 868491; 868567; 868565; 868567; 868725; 86836; 86852; 868421; 868423; 868424; 868425	Potosí	Nor Chichas	Cotagaita	51	15.769,2	30920	30,3	69,7	55	4	0	2	38	1	4778	10991	1212	492	41
869421; 869431; 869433; 869527; 869525; 869523; 869521; 869527; 869178; 869426; 868427; 868429; 869399	Potosí	Sur Chichas	Tupiza	51	21.914,7	42.970	60,6	39,4	70	5	0	3	20	0	13280	8634	4162	1001	24
8669139; 866854	Potosí	Cornelio Saavedra	Tacobamba	47	5.429,9	11.553	6,9	93,2	57	25	0	3	14	1	375	5061			

Table 15. Gendered water access statistics in Tarija

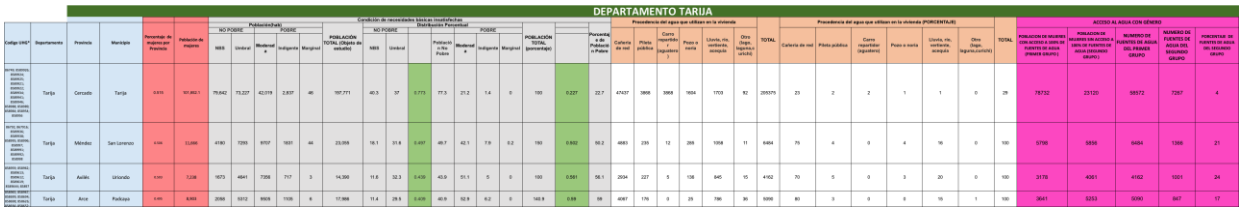
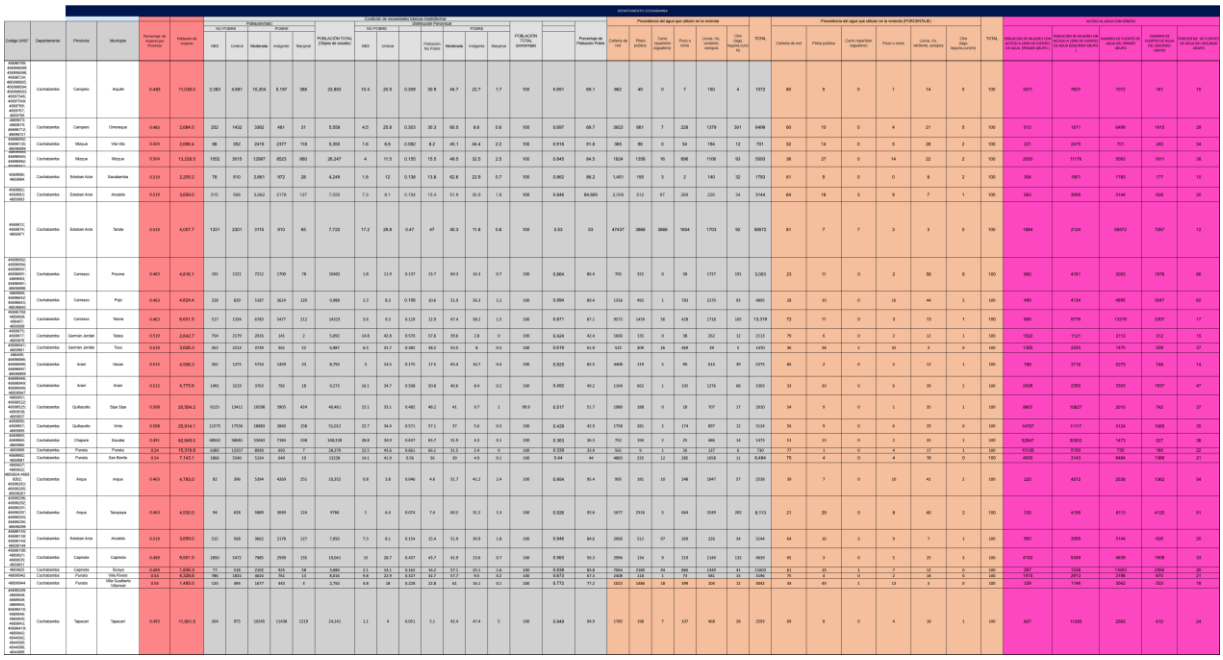
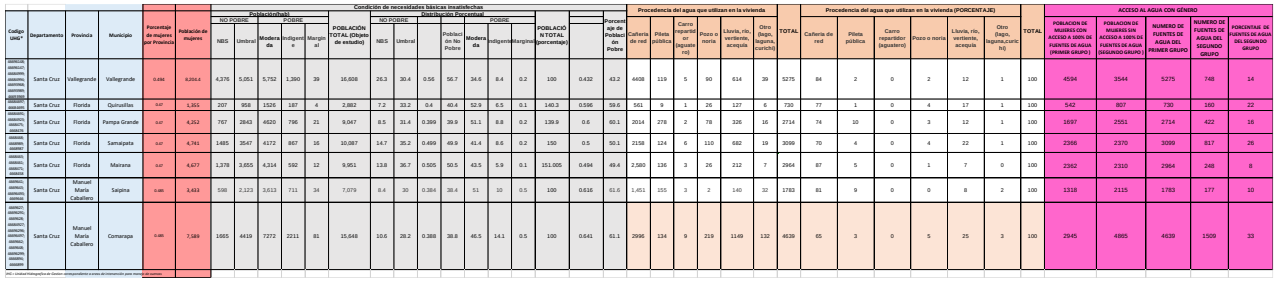


Table 16. Statistics on access to water by gender in Cochabamba





. Education and economic activity in municipalities in the project area and municipalities with similar characteristics.

Table 17. Education and economic activity in municipality VALLEGRANDE in DEPARTMENT OF SANTA CRUZ

VALLEGRANDE							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	7.114	3.747	3.367	Total	14.134	8.785	5.349
Attends	6.033	3.080	2.953	Agriculture, livestock, hunting, fishing, and forestry	7.672	5.614	2.058

Not in attendance	972	617	355	Mining and Hydrocarbons			0
Not specified	109	50	59	Manufacturing industry	559	212	347
				Electricity, gas, water and waste			
				Construction	834	814	
				Trade, transport and warehousing	1.342	634	708

Education and economic activity in municipality FLORIDA in DEPARTMENT OF SANTA CRUZ

FLORIDA							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	9.704	5.127	4.577	Total	16.711	10.695	6.016
Attends	8.191	4.248	3.943	Agriculture, livestock, hunting, fishing, and forestry	8.920	6.616	2.304
Not in attendance	1.391	823	568	Mining and Hydrocarbons			5
Not specified		56		Manufacturing industry	649	359	
				Electricity, gas, water and waste			
				Construction	966	941	25
				Trade, transport and warehousing	2.192	1.070	1.122

Education and economic activity in municipality MANUEL MARÍA CABALLERO in DEPARTMENT OF SANTA CRUZ

MANUEL MARÍA CABALLERO							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	7.922	4.068	3.854	Total	11.391	6.975	4.416
Attends	6.785	3.464	3.321	Agriculture, livestock, hunting, fishing, and forestry	6.733	4.555	2.178
Not in attendance	1.055	563	492	Mining and Hydrocarbons		8	5
Not specified	82			Manufacturing industry	356		
				Electricity, gas, water and waste			
				Construction	543	537	
				Trade, transport and warehousing	1.295	671	624

Education and economic activity in municipality CAMPERO in DEPARTMENT OF COCHABAMBA

CAMPERO							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	12.022	6.204	5.818	Total	15.288	9.828	5.460
Attends	10.106	5.149	4.957	Agriculture, livestock, hunting, fishing, and forestry	8.588	6.366	2.222
Not in attendance	1.826	1.013	813	Mining and Hydrocarbons			
Not specified	90	42	48	Manufacturing industry	737	408	329
				Electricity, gas, water and waste			
				Construction	957	917	
				Trade, transport and warehousing	1.687	812	875

Education and economic activity in municipality MIZQUE in DEPARTMENT OF COCHABAMBA

MIZQUE							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	11.811	5.964	5.847	Total	17.414	10.376	7.038
Attends	9.523	4.860	4.663	Agriculture, livestock, hunting, fishing, and forestry	12.823	7.706	5.117
Not in attendance	2.141	1.049	1.092	Mining and Hydrocarbons	675	638	
Not specified			92	Manufacturing industry		105	145
				Electricity, gas, water and waste			0
				Construction	721	699	
				Trade, transport and warehousing	920	429	491

Education and economic activity in municipality MIZQUE in DEPARTMENT OF COCHABAMBA

ESTEBAN ARZE							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	11.061	5.639	5.422	Total	16.425	9.735	6.690

Attends	9.604	4.926	4.678	Agriculture, livestock, hunting, fishing, and forestry	7.020	4.128	2.892
Not in attendance	1.348	661	687	Mining and Hydrocarbons	31	29	
Not specified	109	52		Manufacturing industry	948	508	440
				Electricity, gas, water and waste			
				Construction	2.341	2.294	
				Trade, transport and warehousing	2.183	1.071	1.112

CARRASCO							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	45.859	23.892	21.967	Total	67.597	41.606	25.991
Attends	37.076	19.142	17.934	Agriculture, livestock, hunting, fishing, and forestry	45.448	29.678	15.770
Not in attendance	8.261	4.493	3.768	Mining and Hydrocarbons		104	
Not specified	522	257	265	Manufacturing industry	1.878	1.106	772
				Electricity, gas, water and waste			
				Construction	2.551	2.482	69
				Trade, transport and warehousing	7.267	3.523	3.744

GERMAN JORDAN							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	9.818	5.158	4.660	Total	15.563	8.980	6.583

Attends	8.573	4.384	4.189	Agriculture, livestock, hunting, fishing, and forestry	5.711	3.312	2.399
Not in attendance	1.177	740	437	Mining and Hydrocarbons			
Not specified				Manufacturing industry	928	503	425
				Electricity, gas, water and waste			
				Construction	1.868	1.836	
				Trade, transport and warehousing	3.022	1.437	1.585

ARANI							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	5.517	2.797	2.720	Total	9.437	4.989	4.448
Attends	4.964	2.541	2.423	Agriculture, livestock, hunting, fishing, and forestry	6.021	3.153	2.868
Not in attendance	506	232	274	Mining and Hydrocarbons			
Not specified				Manufacturing industry	351		190
				Electricity, gas, water and waste		5	
				Construction	585	571	
				Trade, transport and warehousing	1.003	440	563

QUILLACOLLO

REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	101.771	50.905	50.866
Attends	90.515	45.371	45.144
Not in attendance	10.427	5.108	5.319
Not specified	829	426	403

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	145.880	82.986	62.894
Agriculture, livestock, hunting, fishing, and forestry	23.881	12.641	11.240
Mining and Hydrocarbons	553	465	88
Manufacturing industry	17.392	11.861	5.531
Electricity, gas, water and waste	450	366	
Construction	14.836	14.333	503
Trade, transport and warehousing	39.904	21.836	18.068

CHAPARE

REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	80.821	41.482	39.339
Attends	70.324	35.922	34.402
Not in attendance	9.744	5.195	4.549
Not specified	753	365	388

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	120.072	72.032	48.040
Agriculture, livestock, hunting, fishing, and forestry	44.181	27.945	16.236
Mining and Hydrocarbons	219	186	
Manufacturing industry	8.934	5.692	3.242
Electricity, gas, water and waste	270	215	
Construction	10.766	10.392	374
Trade, transport and warehousing	25.150	13.936	11.214

PUNATA

REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	15.870	7.988	7.882
Attends	14.309	7.216	7.093
Not in attendance	1.427	702	725
Not specified	134	70	

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	24.655	13.408	11.247
Agriculture, livestock, hunting, fishing, and forestry	8.467	4.872	3.595
Mining and Hydrocarbons	42		
Manufacturing industry	2.095	926	1.169
Electricity, gas, water and waste		30	
Construction	2.372	2.324	48
Trade, transport and warehousing	5.568	2.470	3.098

ARCH

REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	6.956	3.467	3.489
Attends	5.492	2.852	2.640
Not in attendance	1.349	556	793
Not specified	115	59	56

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	10.519	5.703	4.816
Agriculture, livestock, hunting, fishing, and forestry	8.714	4.637	4.077
Mining and Hydrocarbons	115	108	
Manufacturing industry			99
Electricity, gas, water and waste	1	1	0
Construction	398	384	
Trade, transport and warehousing			

CAPINOTA

REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	9.167	4.672	4.495
Attends	7.981	4.083	3.898
Not in attendance	1.093	545	548
Not specified	93		49

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	13.780	8.043	5.737
Agriculture, livestock, hunting, fishing, and forestry	7.819	4.297	3.522
Mining and Hydrocarbons		95	
Manufacturing industry	808	599	209
Electricity, gas, water and waste			
Construction	1.108	1.085	
Trade, transport and warehousing	1.620	882	738

TAPACARÍ

REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	7.956	4.123	3.833
Attends	6.456	3.489	2.967
Not in attendance	1.436	601	835
Not specified			31

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	12.747	7.301	5.446
Agriculture, livestock, hunting, fishing, and forestry	9.808	5.752	4.056
Mining and Hydrocarbons	87		
Manufacturing industry	428	104	324
Electricity, gas, water and waste	5		
Construction	415	401	
Trade, transport and warehousing	670	380	

DEPARTMENT OF POTOSI

JOSÉ MARÍA LINARES							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	15.558	7.989	7.569	Total	22.226	12.671	9.555
Attends	13.288	6.978	6.310	Agriculture, livestock, hunting, fishing, and forestry	14.860	8.394	6.466
Not in attendance	2.080	910	1.170	Mining and Hydrocarbons	508	491	
Not specified	190	101		Manufacturing industry	681	307	374
				Electricity, gas, water and waste	8	8	0
				Construction	1.341	1.305	
				Trade, transport and warehousing	1.675	760	915

TOMÁS FRÍAS							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	69.472	34.725	34.747	Total	91.388	54.151	37.237
Attends	61.894	31.031	30.863	Agriculture, livestock, hunting, fishing, and forestry	18.438	10.988	7.450
Not in attendance	7.041	3.427	3.614	Mining and Hydrocarbons	10.016	9.486	530

Not specified	537	267	270	Manufacturing industry	4.754	3.107	1.647
				Electricity, gas, water and waste		186	35
				Construction	7.158	6.741	417
				Trade, transport and warehousing	19.327	10.129	9.198

CHAYANTA							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	31.334	16.369	14.965	Total	47.638	28.605	19.033
Attends	25.744	13.837	11.907	Agriculture, livestock, hunting, fishing, and forestry	35.543	21.612	13.931
Not in attendance	5.011	2.244	2.767	Mining and Hydrocarbons	1.162	1.128	

Not specified	579	288	291	Manufacturing industry	710	307	403
				Electricity, gas, water and waste	5		
				Construction	2.020	1.959	
				Trade, transport and warehousing	2.362	1.132	1.230

NOR CHICHAS							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	12.803	6.399	6.404	Total	19.539	11.423	8.116
Attends	11.020	5.549	5.471	Agriculture, livestock, hunting, fishing, and forestry	11.347	6.695	4.652
Not in attendance	1.650	788	862	Mining and Hydrocarbons	1.328	1.223	105

Not specified			71	Manufacturing industry	465	214	251
				Electricity, gas, water and waste			0
				Construction	1.229	1.203	26
				Trade, transport and warehousing	1.913	733	1.180

CORNELIO SAAVEDRA							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	17.846	9.087	8.759	Total	26.367	15.267	11.100
Attends	15.254	7.870	7.384	Agriculture, livestock, hunting, fishing, and forestry	18.560	10.671	7.889
Not in attendance	2.353	1.100	1.253	Mining and Hydrocarbons	787	756	31

Not specified	239			Manufacturing industry	554	265	289
				Electricity, gas, water and waste			1
				Construction	1.387	1.366	21
				Trade, transport and warehousing	2.007	904	1.103

DEPARTMENT OF TARIJA

CERCADO			
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	54.247	27.178	27.069
Attends	47.000	23.248	23.752
Not in attendance	6.688	3.642	3.046
Not specified	559	288	271

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	22.226	12.671	9.555
Agriculture, livestock, hunting, fishing, and forestry	14.860	8.394	6.466
Mining and Hydrocarbons	508	491	
Manufacturing industry	681	307	374
Electricity, gas, water and waste	8	8	0
Construction	1.341	1.305	
Trade, transport and warehousing	1.675	760	915

MÉNDEZ							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	10.254	5.212	5.042	Total	17.786	10.537	7.249
Attends	8.283	4.182	4.101	Agriculture, livestock, hunting, fishing, and forestry	9.635	6.152	3.483
Not in attendance	1.882	983	899	Mining and Hydrocarbons		30	
Not specified			42	Manufacturing industry	803	346	457
				Electricity, gas, water and waste			
				Construction	1.542	1.486	56
				Trade, transport and warehousing	1.863	1.065	798

AVILÉS			
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE			
School attendance	Total	Men	Women
Total	6.022	3.035	2.987
Attends	4.611	2.296	2.315
Not in attendance	1.322	680	642
Not specified		59	30

REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
Economic activity	Total	Men	Women
Total	11.231	6.434	4.797
Agriculture, livestock, hunting, fishing, and forestry	8.146	4.974	3.172
Mining and Hydrocarbons		5	1
Manufacturing industry			
Electricity, gas, water and waste		1	
Construction	494	473	21
Trade, transport and warehousing	557	265	292

ARCE							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	15.188	7.822	7.366	Total	27.065	16.139	10.926
Attends	12.430	6.246	6.184	Agriculture, livestock, hunting, fishing, and forestry	9.351	6.659	2.692
Not in attendance	2.617	1.517	1.100	Mining and Hydrocarbons	50		
Not specified		59	82	Manufacturing industry	1.350	1.001	349
				Electricity, gas, water and waste	69	58	
				Construction	2.604	2.497	107
				Trade, transport and warehousing	6.532	3.260	3.272

DEPARTMENT OF CHUQUISACA

TOMINA							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	10.927	5.586	5.341	Total	16.282	10.524	5.758
Attends	8.668	4.322	4.346	Agriculture, livestock, hunting, fishing, and forestry	10.248	7.534	2.714
Not in attendance	2.132	1.196	936	Mining and Hydrocarbons			
Not specified			59	Manufacturing industry	543	218	325
				Electricity, gas, water and waste			1
				Construction	997	979	
				Trade, transport and warehousing	1.205	574	631

ZUDAÑEZ							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	12.677	6.548	6.129	Total	16.584	10.702	5.882
Attends	10.035	5.236	4.799	Agriculture, livestock, hunting, fishing, and forestry	9.347	7.037	2.310
Not in attendance	2.502	1.247	1.255	Mining and Hydrocarbons		21	1
Not specified	140	65	75	Manufacturing industry	825	227	598
				Electricity, gas, water and waste		8	1
				Construction	1.421	1.396	25
				Trade, transport and warehousing	1.559	733	826

YAMPARÁEZ							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	8.742	4.409	4.333	Total	11.281	7.065	4.216
Attends	7.233	3.698	3.535	Agriculture, livestock, hunting, fishing, and forestry	7.111	4.928	2.183
Not in attendance	1.402	661	741	Mining and Hydrocarbons			0
Not specified	107	50		Manufacturing industry	784	195	589
				Electricity, gas, water and waste			1
				Construction	767	760	
				Trade, transport and warehousing	866	478	388

OROPEZA							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	86.431	42.969	43.462	Total	117.395	65.829	51.566
Attends	77.098	38.308	38.790	Agriculture, livestock, hunting, fishing, and forestry	14.873	9.690	5.183
Not in attendance	8.399	4.205	4.194	Mining and Hydrocarbons	499	454	45
Not specified	934	456	478	Manufacturing industry	11.203	6.683	4.520
				Electricity, gas, water and waste	279	241	
				Construction	14.334	13.939	395
				Trade, transport and warehousing	29.506	15.446	14.060

AZURDUY							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	8.794	4.601	4.193	Total	9.990	6.507	3.483
Attends	7.036	3.727	3.309	Agriculture, livestock, hunting, fishing, and forestry	7.045	5.182	1.863
Not in attendance	1.672	834	838	Mining and Hydrocarbons			1
Not specified	86		46	Manufacturing industry	373	86	287
				Electricity, gas, water and waste			0
				Construction	376	368	8
				Trade, transport and warehousing	409	178	231

BELISARIO BOETO							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	3.419	1.773	1.646	Total	4.941	3.167	1.774
Attends	2.815	1.419	1.396	Agriculture, livestock, hunting, fishing, and forestry	3.149	2.301	848
Not in attendance	555	330	225	Mining and Hydrocarbons			0
Not specified	49		25	Manufacturing industry	123		59
				Electricity, gas, water and waste			0
				Construction	227	225	
				Trade, transport and warehousing	355	135	220

NOR CINTI							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	25.981	13.104	12.877	Total	32.755	19.703	13.052
Attends	19.833	10.121	9.712	Agriculture, livestock, hunting, fishing, and forestry	21.854	14.131	7.723
Not in attendance	5.834	2.821	3.013	Mining and Hydrocarbons			
Not specified	314	162		Manufacturing industry	1.182	444	738
				Electricity, gas, water and waste			1
				Construction	1.773	1.737	
				Trade, transport and warehousing	2.477	1.162	1.315

NOR CINTI							
REGISTERED POPULATION AGED 6 TO 19 BY SEX, ACCORDING TO SCHOOL ATTENDANCE				REGISTERED POPULATION AGED 10 YEARS AND OVER, BY ECONOMIC ACTIVITY AND OCCUPATIONAL CATEGORY			
School attendance	Total	Men	Women	Economic activity	Total	Men	Women
Total	25.981	13.104	12.877	Total	32.755	19.703	13.052
Attends	19.833	10.121	9.712	Agriculture, livestock, hunting, fishing, and forestry	21.854	14.131	7.723
Not in attendance	5.834	2.821	3.013	Mining and Hydrocarbons			
Not specified	314	162		Manufacturing industry	1.182	444	738
				Electricity, gas, water and waste			1
				Construction	1.773	1.737	
				Trade, transport and warehousing	2.477	1.162	1.315